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		gcsjournal2012@gmail.com	

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Editorial

Dr. Ava D. Desai

Professor, Department of Gynecological Oncology
The Gujarat Cancer & Research Institute, Ahmedabad

Current Status of Gynecologic Oncology In India

The practice of gynaecological oncology is as old as the hills. Vaginal speculae were found in the volcanic ruins of Pompeii. Fourth century Indian scriptures mentioned procedures to remove tumours of the cervix and vagina. Hippocrates described vesicular moles and cervical lesions. At the turn of the nineteenth century, Ernst Wertheim perfected the art of radical hysterectomy in Vienna, while Marie and Pierre Curie discovered radium and paved the way for radiation oncology. Papanicolau and Traut, Hans Hinselmann, Joe Meigs, Schauta, Brunschwig, Subodh Mitra, Taussig, Stanley Way, Victor Bonney, Daniel Dargent - the list is endless.

Even so, it was only in the latter half of the twentieth century that gynaecological oncology gained recognition as a subspecialty requiring years of specialized and intensive training! Over these past forty-odd years the subspecialty has progressed by leaps and bounds. The Gujarat Cancer & Research Institute has been at the forefront of this development in India, establishing the first department of gynecologic oncology in the country in 1972. At that time many, even from our profession, were unaware that such a subspecialty existed!

Gynecological cancers are a huge health problem in India. Cancer of the cervix is the scourge of our country women. We bear one fourth of the world's cervical cancer burden; and see most of these in advanced stages. 74,000 of our country women still die from this disease every year. Early detection is the exception rather than the rule. In spite of sincere efforts on all fronts, these statistics remain unchanged. Secondary prevention has not succeeded in India, probably because of many logistical issues. What about primary prevention? The HPV vaccination is now freely available. It holds much promise for our countrywomen who do not have access to smears even once in their lifetimes. However, ignorance and cost prevent it from being used in those women most at risk of cervical cancer. All this must be given prime importance by our policy makers.

Breast cancer is on the rise due to lifestyle changes and urbanization. These factors are also probably responsible for the increasing numbers of endometrial and ovarian cancers that we see and treat. Trophoblastic tumours and germ cell ovarian tumours

are far commoner here than in the developed world. Other HPV related cancers such as vulvar cancers are also seen more frequently than before.

There is a very large evidence base linking subspecialty care with improved outcome. Hundreds of thousands of Indian women need oncological care by trained specialists. At present there is an obvious disparity between demand and supply. Each medical college should have at least a division of gynecologic oncology. Preventive aspects and their importance need to be strictly and repeatedly emphasized in the undergraduate curriculum. Undergraduate and nursing programs should include clinical aspects of VIA, smear taking and colposcopy, if we are to make these available at district levels all over the country. Much needs to be done at postgraduate and post doctoral levels for training in our subspecialty. Only then can we manage properly the huge load of gynecologic cancer in India.

On the other hand, noteworthy strides have been made in our field. Surgical and radiotherapy techniques have evolved, and kept up with the rest of the world. Extremely sophisticated technology and instrumentation is available for diagnosis and therapy. The administration of chemotherapy has undergone a sea change. Targeted therapies are routinely being employed. Robotic surgery is now mushrooming in several centres across the country. Indeed, we are fortunate to be a part of this most exciting and innovative era of gynaecological oncology.

It is interesting to note that most of the articles and case reports in this edition are related to ovarian tumours. Perhaps this reflects a change in the cross-section of cases we are treating. A decade or two ago, most articles would have been related to cervical cancer alone!

The risk of malignancy index is an invaluable preoperative tool. Patients can be triaged into those who require speciality care and those who can be treated by the general gynecologist. Mismanagement and incorrect surgery can be avoided if this simple tool is employed in all cases with equivocal findings. Dr. Chawla has shown the feasibility and ease of employment of this very valuable index. It needs to be highlighted at general gynecological forums, and in journals of obstetrics and gynecology, so that

awareness increases and it becomes routinely employed.

Two of the case reports deal with primary gastrointestinal and biliary tumours presenting as ovarian masses. The distinction was made possible by careful pre-operative imaging and intra-operative exploration. These cases received proper diagnosis and treatment because of the knowledge and expertise available at our centre.

Fibroids, though benign, are commonly encountered by us when they present as large pelvic tumours. The case reports in this edition are of special note. One of them presented as a giant abdominal tumour, which proved to be a huge, necrotic fibroid filled with pus – a very rare case of pyomyoma. The value of this report is to make us aware of this potentially life threatening complication of a benign fibroid.

In our country malignant germ cell tumours are quite common. However, growing teratoma syndrome is a rare and serious condition which always

bears reporting. Awareness of this entity can save the patient from useless and toxic chemotherapy, and timely surgery can prevent unnecessary morbidity and mortality.

Primary fallopian tube carcinoma, traditionally considered very rare, is now known to be quite common, especially in cases of “primary peritoneal cancer”. They are generally misdiagnosed as ovarian cancers. However, tubal carcinoma masquerading as a uterine malignancy is indeed a rare and interesting entity.

In India we have a wealth of data which, if compiled, will be invaluable. We have sheer volumes of clinical material. However we are unable to produce the proportionate amount of research, probably for several genuine reasons. We need to address this issue from the root level. We can then have our own guidelines, lay down protocols and have multi-centric trials pertinent to the Indian scenario. The ultimate aim of our labour must be to improve the standard of management of cancer in women.

“Liberty is to the collective body, what health is to every individual body. Without health no pleasure can be tasted by man; without liberty, no happiness can be enjoyed by society.”

- Henry St. John

Dr. T.B. Patel Oration Award 2011-2012

Dr. Paul Sebastian

M.S.
Director, Regional Cancer Centre, Thiruvananthapuram



Oral Cancer Control - Three Decades of Experience in a Low Resource Setting

Oral cancer is a predominant cause of cancer death in India as published in Lancet. It is the most common cancer in males and fourth most common in female. It is mostly due to tobacco which is preventable. It can be cured if treated early but majority of the patients affected belong to the lower strata of society who have no means to seek treatment – present in advanced stage.

In 1981, department of radiotherapy was upgraded to Regional Cancer Centre (RCC) under the dynamic leadership of its 1st Director Dr. Krishna Nair. In 2002, RCC moved to subspecialty based with good results in past 10 yrs. Now it is one of the leading cancer institutes in India.

In oral cancer the main aim is not only for cure but also to restore form and function and it should be cost effective. The treatment of oral cancer has evolved from primary surgery to a multidisciplinary care. Nothing dramatic has changed in last few decades in the treatment of oral cancer. There has been a slow improvement in survival figure but gradual improvement in quality of care mainly due to improved understanding of knowledge of disease biology, improved technology, improved surgical technique etc. The crucial aspect of cancer treatment – first chance is the best chance, If surgery is the first 1st modality ensure proper three dimensional excision of the lesion with safe margin. However in spite of safe margin there are recurrences. The study by Bredon et al states that inspite of negative margin there are molecular marker at the margins which predict local site recurrence; the same was demonstrated in study from RCC Trivandrum.

One of the main reasons for fear of treatment of oral cancer is fear of losing the mandible because it causes significant cosmetic deformity when removed. Mandible has to be addressed of in selective cases only. In the past, patients were treated with commando operation where whole of mandible was removed as a part of treatment which is no more true. Today, even if

it needs to be removed, only part is removed preserving the structure and cosmesis.

Neck has to be addressed in oral cancer because the commonest mode of spread is lymph node metastasis. Neck dissection has come a long way from radical neck dissection to selective neck dissection and super selective neck dissection. Radical neck dissection is rarely done these days. During neck dissection one has to be careful of tortuous internal carotid artery which can be mistaken for a lymph node.

We have the era of selective neck dissection because lymphatic spread occur in a determined fashion. In our study, the occurrence of occult metastasis to level 3/4 is zero% in clinically N0 neck. In spite of selective neck dissection patient still complains of shoulder pain due to spinal accessory nerve paresis or trauma during level II node dissection. In our study we found that isolated level IIb involvement never occurs, hence there is no need to remove level II node in early stage; there by decreasing the morbidity to spinal accessory nerve paresis/trauma. It has been proved in randomized control trial that patient with level IIb node sparing selective neck dissection did better as compared with supra omohyoid neck dissection.

One major complication of oral cancer surgery is wound breakdown. Various incisions have been described for neck dissection and the best results are obtained by single skin crease incision along the transverse crease of neck which gives good cosmesis and functional results. One of the common problems of patient undergoing neck dissection is marginal mandibular nerve paresis. Standard textbook say that the nerve should never be dissected and thus preserved. The anatomy of the nerve is constant, it is found at the junction of facial artery to lower border of mandible. The nerve should be identified traced and thus preserved. Tracheostomy should be avoided during head & neck cancer surgery instead the patient

should be kept electively intubated for 24 hrs. post surgery.

There are many options for closure ranging from primary closure to micro vascular free flap and many local flaps. The nasolabial flaps can be used for reconstruction in a variety of cases like floor of mouth, tongue reconstruction etc. The platysma flap can be used for various reconstructions but is less reliable than nasolabial flaps. The masseter flap described by Rammohan Tiwari is very useful for retromolar trigone lesion. Submental flap is a versatile and reliable flap and is proved to be oncologically safe. The deltopectoral flap is not used much. The pectorals muscle myocutaneous flap is the workhorse of head & neck reconstruction. Normally it can reach upto the zygoma but with innovative technique the flap can reach upto the scalp. The latissimus dorsi flap can rarely be used for oral reconstruction. The microvascular free flap like free fibular flap and anterolateral thigh flap can be used especially in young adults. Prosthesis can also be used to repair the defect.

We presented our 10 yrs experience in using regional flap as a low cost option in developing countries. We prospectively studied 676 cases in whom surgery was the primary modality. Tracheostomy was done in 1% of patients, 52% of patients had co-morbid illness; complication rate was 15% which was mostly wound complication. Independent risk factors were history of COPD, advanced disease and long duration of surgery. The result was comparable to other series worldwide. Salvage surgery has high rate of complication. Advances in radiotherapy has not solved the problem of mucositis and xerostomia. Alternative Ayurvedic preparations have decreased mucositis, patients had

good oral hygiene. Also the treatment was cost effective. Study about novel ayurvedic molecular with biological response modifiers is ongoing.

Concurrent chemotherapy has a definite role in head & neck cancer and has significantly improved results. Large numbers of patients do not complete chemotherapy due to increased complication and poor nutrition. The standard method of improving poor nutrition is PEG tube insertion. The other method which we have developed is a feeding pharyngostomy. Neoadjuvant chemotherapy can be given while waiting for surgery. Cetuximab has improved overall survival and improved locoregional control but it has its own side effects. Nimotuzumab is a newer molecule which needs further study. Young pt fared better in overall survival. Forty-two % of cancer in India is due to tobacco & 7.5 % are HPV +ve. This calls for action against tobacco. It is a preventable cause of cancer. We at RCC Trivandrum have set up community oncology centre in 1985 which carries out various programs like tobacco awareness drive and cessation programme.

Recently launched 'tobacco free Kerala' by the health minister to the state. Trivandrum oral cancer screening study proved that 3 round of screening in high risk individual reduce the risk by 34% for development of oral cancer. Leucoplakia is a premalignant lesion which increases the chances of subsequent malignancy. Pain management and palliative care: the pain clinic was started in RCC Trivandrum in 1986. It has been given a departmental status in 1994. RCC manufactures liquid / oral morphine. Kerala is world leader in home palliative care. We have simple but innovative technique to give morphine to the patient.

"Always laugh when you can. It is a cheap medicine."

-Lord Byron

Risk of Malignancy Index (RMI) for Ovarian Masses: Feasibility and Accuracy

Chawla Heena¹, Mankad Meeta H², Dave Pariseema S³, Chauhan Anjana S⁴

Fellow¹, Professor and Unit Head², Professor³, Associate Professor⁴
Department of Gynecological Oncology

Summary

A pelvic mass is one of the most frequent indications for referral to specialist gynecologists. The preoperative diagnosis of whether a mass is malignant cannot always be made with current diagnostic modalities. Various combined methods for evaluating the risk of ovarian cancer in women have been proposed. This has given much better results than a single parameter. The risk of malignancy index (RMI) is a simple scoring system based on menopausal status, ultrasound, and serum concentrations of CA-125. This is a retrospective study to evaluate the accuracy of the RMI and determine its applicability in our setting. Therefore, a retrospective review of medical records of women with pelvic masses admitted for laparotomy in a single unit of gynecological oncology at the Gujarat Cancer and Research Institute during January 2008-July 2012 was conducted. One hundred and thirty four women who underwent laparotomy for suspected primary ovarian pathology during this period were enrolled. Data collected included menopausal status, ultrasound morphology and preoperative serum CA 125 levels. In our study, RMI 2 was used and the cut-off level of 250 was used to indicate malignancy. The RMI was evaluated for sensitivity, specificity and positive (PPV) and negative (NPV) predictive values with reference to the presence of malignant or benign disease. Out of the one hundred and thirty four women underwent laparotomy for suspected primary ovarian pathology, 94 (70%) had malignancy and 40 (30%) had benign ovarian masses. In the subgroup of patients with RMI>250, 91% were malignant and only 9% were benign masses whereas in those with RMI<250, 62% were benign and 38% were malignant. Further, the sensitivity of the RMI for diagnosing malignant lesions was 79% (74/94) while the specificity was 83% (33/40). The PPV was 91% (74/81) and the NPV was 62% (33/53). Thus, the RMI 2 score in our setting appeared to be a simple and applicable method that can be utilized in the preoperative evaluation of women with ovarian masses.

Introduction

An ovarian mass is one of the most common clinical presentations in gynecology but the ability to differentiate between benign and malignant disease remains a diagnostic dilemma. It is well known that the quality of primary cytoreductive surgery is one of the most important prognostic factors in women with ovarian cancer. The extent of cytoreductive surgery is associated with the specific skills and experience of well-trained gynecologic oncologists hence, improving the prognosis and five year survival. An accurate preoperative evaluation is thus essential in ensuring that an appropriate referral is made.¹ Furthermore, appropriate and timely referral to a gynecologic oncologist has been proven to increase survival in patients with ovarian cancer. Streamlining of referrals in oncology has always been a clinical challenge in attempting to create a satisfactory safety net. A standardized method for preoperative identification of probable malignant masses would allow optimization of first-line treatment for women with ovarian cancer.² Currently, clinical examination, ultrasound assessment, and assays of tumor markers are part of the standard work-up for an adnexal mass. Although, none of these indicators alone is very sensitive or specific for detecting malignancy. For ultrasonographic techniques, the sensitivity and specificity in diagnosis of malignant condition is 62% and 73%, respectively.^{3,4} Serum CA 125 is another promising tool. Elevation of serum CA 125 concentrations is documented in 85% of epithelial ovarian cancers.^{4,5} At the cut-off level of 35 U/ml, the sensitivity is 83.1% but the specificity is only 39.3%.⁵ The risk of malignancy index (RMI) is a scoring system of the combination of various clinical features. Jacobs et al⁶ (1990) was first to devise RMI 1. He utilized the ultrasound findings, menopausal status and serum CA 125 levels to predict the risk of malignancy with greater sensitivity and specificity than any one factor alone. Later, it was adjusted by Tingulstad et al⁷ in 1996 as RMI 2 and again modified in 1999⁸ as RMI 3. Yamamoto et al⁹ created their own model of a malignancy risk index. They added the

parameter of the tumor size (S) to the RMI and have termed it the RMI4.

Some of the potential advantages of RMI include rapid triage of patients through the referral system and fewer operations for benign masses being performed by gynecologic oncologists. Furthermore, there will be less need for re-operation on women not fully staged for early ovarian cancer. If more women are operated on early in the course of cancer, this may lead to increased survival. The RMI scoring method appears to be attractive in its simplicity, lack of invasiveness and its potential for use in less specialized units.¹⁰ The aim of this study was to evaluate the accuracy of the RMI and determine its applicability in our setting.

Material and Methods

We conducted a retrospective review of medical records of women with pelvic masses admitted for laparotomy in a single unit of gynaecological oncology at the Gujarat Cancer And Research Institute during January 2008- July 2012. One hundred and thirty four women underwent laparotomy for suspected primary ovarian pathology during this period. Data collected included menopausal status, ultrasound morphology and preoperative serum CA 125 levels. Preoperative serum levels of CA-125 were measured by Electrochemiluminescence Immunoassay (ECLIA) method. An ultrasonographic evaluation of their pelvic mass for each of the following characteristics: multilocular cyst, solid areas, intra-abdominal metastases, ascites, and bilateral lesions were done. For each ultrasonographic characteristic a score of one was assigned and a total ultrasound score (U) was calculated. Postmenopausal status (M) was defined as more than one year of amenorrhea or an age of more than 50 years in women who have had a hysterectomy. For analysis purposes, tumours of low malignant potential were classified as malignant because it was considered ideal for these tumours to be surgically managed by a gynaecologic oncologist and the final histopathology was regarded as the true definite outcome. The difference of the three RMI is based on the allocation of the U and M scores.

Calculation of RMI

RMI 1 (Jacobs et al 1990) = $U \times M \times CA125$; an ultrasound score of 0 considered as $U = 0$, a score of 1 considered as $U = 1$, and a score of 2 considered as $U = 3$. Premenopausal status considered as $M = 1$ and postmenopausal status considered as $M = 3$. The serum level of CA125 was used directly in the calculation.

RMI 2 (Tingulstad et al 1996) = $U \times M \times CA125$; an ultrasound score of 0 or 1 considered as U

= 1, and a score of 2 considered as $U = 4$. Premenopausal status considered as $M = 1$ and postmenopausal status considered as $M = 4$. The serum level of CA125 was used directly in the calculation.

RMI 3 (Tingulstad et al 1999) = $U \times M \times CA125$; an ultrasound score of 0 or 1 considered as $U = 1$, and a score of 2 considered as $U = 3$. Premenopausal status considered as $M = 1$ and postmenopausal status considered as $M = 3$. The serum CA125 level was used directly in the calculation.

RMI 4 (Yamamoto et al 2009) = $U \times M \times S$ (size in centimeters) $\times CA-125$, where a total ultrasound score of 0 or 1 made $U = 1$, and a score of ≥ 2 made $U = 4$. Premenopausal status made $M = 1$ and postmenopausal status made $M = 4$. A tumor size (single greatest diameter) of < 7 cm made $S = 1$, and ≥ 7 cm made $S = 2$. The serum level of CA-125 was applied directly to the calculation.^{6,7,8,9}

RMI 2 was found to be more reliable in discriminating benign and malignant disease by various investigators.^{3,8} Thus, In our study RMI 2 was used and the cut-off level of 250 was used to indicate malignancy. The RMI was evaluated for sensitivity, specificity and positive (PPV) and negative (NPV) predictive values with reference to the presence of malignant or benign disease.

Results

Out of one hundred and thirty four women who underwent laparotomy for suspected primary ovarian pathology, according to the histopathological examination of the specimens, 94(70%) had malignancy and 40 (30%) had benign ovarian masses.

The results obtained following calculation of the RMI 2 score are displayed in the Table 1 below:

Table 1: Evaluation by RMI 2 depicting benign and malignant cases

RMI2	Benign	Malignant
<250	33 (62%)	20 (38%)
>250	7 (9%)	74 (91%)

In patients with $RMI > 250$, 91% were malignant and only 9% were benign masses whereas in those with $RMI < 250$, 62% were benign and 38% were malignant. The sensitivity, specificity, positive predictive value and false predictive value are shown in the Table 2. The sensitivity of the RMI for diagnosing malignant lesions was 79% (74/94) while the specificity was 83% (33/40). The PPV was 91% (74/81) and the NPV was 62% (33/53). The histopathological classification of all cases of malignant and benign cases in relation to RMI score are given in Table 3 and 4 respectively showing that

Table 2: Evaluation by RMI 2 depicting sensitivity, specificity, positive predictive value and negative predictive value

Sensitivity	79 %
Specificity	83 %
Positive Predictive value (PPV)	91 %
Negative Predictive value (NPV)	62 %

Table 3: Definitive histopathological diagnosis of malignant ovarian masses in relation to RMI score (n=94)

Diagnosis	RMI<250	RMI>250
	(n=20)	(n=74)
Serous papillary carcinoma		
Borderline	2	4
Malignant	6	41
Mucinous carcinoma		
Borderline	3	2
Malignant	2	8
Seromucinous carcinoma	-	2
Endometrioid carcinoma	2	7
Metastatic adenocarcinoma	3	4
Others	2	6
Total	20 (21%)	74 (79%)

Table 4: Histopathological diagnosis of benign adnexal masses in relation to RMI score (n=40)

Diagnosis	RMI<250	RMI>250
	(n=33)	(n=7)
Serous cystadenoma	13	-
Mucinous cystadenoma	5	2
Fibrothecoma/ Fibroma	-	2
Mature cystic teratoma	-	1
Follicular simple cyst	3	-
Haemorrhagic cyst	4	-
Leiomyoma	4	-
Infective	4	2
Total	33(83%)	7(17%)

majority (56%) of the cases were of serous papillary carcinoma (six borderline and forty- seven malignant). Fifteen cases (16%) were of mucinous carcinoma (five borderline and ten malignant). There was one case each of transitional cell carcinoma and epithelioid leiomyosarcoma with RMI score <250 and two cases each of transitional cell carcinoma, ovarian fibrosarcoma and carcinoma appendix with RMI score >250. Amongst the benign cases, thirteen were

of serous cystadenoma (32.5%), followed by seven (2%) of mucinous cystadenoma, one of fibrothecoma, fibroma and mature cystic teratoma each. Amongst the infective variety, there was one case each of tuberculosis, endometriosis, salpingo-oophoritis and xanthogranulomatous inflammation with RMI score <250 and one case each of tuberculosis and endometriosis with RMI score >250.

The various false positive and false negative cases are depicted in the Table 5. It was observed that out of the seven false-positive cases two patients had cystadenoma, one each had endometriosis, tuberculosis and mature cystic teratoma.

Discussion

The prevalence of ovarian neoplasms has been rising during last decades. Silent occurrence and slow progression, besides few effective methods for early diagnosis makes its mortality rate the highest among gynaecologic malignancies. If patients with ovarian cancers are diagnosed at stage I, the cure rate could be as high as 80-90% and the mortality rate could decrease up to 50%. Hence, a new method of early diagnosis is of great importance for prediction of the prognosis and medical management of the ovarian neoplasm.¹¹ Our results for RMI were in agreement with the results from other studies in which RMI was suggested to be better than other single parameters.

In the current study, the overall prevalence of malignancy was 70%, including the borderline ovarian tumors (11%). We evaluated the RMI 2 in our population and found that at a cut-off value of 250 was able to correctly identify 79% of women with ovarian cancer prior to their operation. This sensitivity of the RMI 2 score is greater than that noted in similar studies. We found RMI to be successful in identifying the benign cases (specificity=83%). This finding was in accordance with the findings of other studies (specificity ranged between 77 to 97%). Andersen ES et al¹², Meray et al¹³ found that RMI is negative in most of non-epithelial ovarian cancers, thus these cases were excluded from our study. Table 6 summarizes the results of past related studies. The best cut-off value for RMI in several publications was 200.^{6,7,10} If the cut-off value of RMI is set 238 instead of 200, the sensitivity, specificity, PPV and NPV improves dramatically comparing to most of previous studies.

In the present study, five (71%) of the seven false-positive cases were premenopausal and included two patients with cystadenoma, one each with endometriosis, tuberculosis and mature cystic teratoma. Amongst these, 40% of the false-positive cases were due to ovarian cystadenomas, and 20% due to endometriomas. For endometriomas and tuberculosis, elevation of CA 125 level due to peritoneal irritation is likely to produce a high RMI

Table 5: False positive and false negative cases

False Positive Cases (N=7)	n (%)	False Negative Cases (N=20)	n (%)
Mucinous cystadenoma	2 (30%)	Serous papillary carcinoma	6 (30%)
Fibrothecoma	1 (14%)	Borderline malignancy	
		Serous	2 (10%)
		Mucinous	3 (15%)
Fibroma	1 (14%)	Metastatic adenocarcinoma	3 (15%)
Mature cystic teratoma	1 (14%)	Mucinous carcinoma	2 (10%)
Endometriosis	1 (14%)	Endometrioid	2 (10%)
Tuberculosis	1 (14%)	Others	
		Transitional cell carcinoma	1 (5%)
		Epithelioid leiomyosarcoma	1 (5%)

Table 6: Comparison of our results with previous studies

Study	No.	Sensitivity	Specificity	PPV	NPV
Jacobs et al.1990	143	85.4	96.6	-	-
Tingulstad et al.1996	173	71	96	89	88
Tingulstad et al.1999	365	71	92	69	92
Morgante et al.1999	124	58	95	78	87
Manjunath et al. 2001	152	73	91	93	67
Obeidat et al.2004	100	90	89	96	78
Ulusoy et al.2006	296	71	80	67	84
Tahereh et al 2011	151	89.5	94.7	71	98
Our study	134	79	83	91	62

score. Solid parts found in dermoid cysts and multilocular cystic lesions found in mucinous cystadenomas may attribute to the false positive. It has recently been suggested that false positive rates, in the case of endometriomas, may be improved by further using ultrasonography to identify an ovarian crescent sign (OCS), a rim of visible healthy ovarian tissue in the affected ovary. The use of colour doppler has similarly been shown to increase the diagnostic accuracy of ultrasonography in the assessment of adnexal malignancies with a high specificity. Also in these circumstances, we suggest that a laparoscopic evaluation may be undertaken to exclude ovarian malignancy, which would substantially obviate the need for a laparotomy. Laparoscopy has been shown to be useful in identifying ovarian cancer and may be offered to premenopausal women who have an RMI score of more than 250.

In any scoring system designed to exclude malignancy, a worrying concern is the false-negative rate as this should ideally be zero or close to zero. In our study, twenty (21%) of ninety four women with malignant ovarian mass had an RMI score of less than 250. Majority of the false negative cases were of serous papillary carcinoma and borderline ovarian malignancy. Out of these six cases of serous papillary carcinoma four were of early stage disease. Previous studies have similarly demonstrated a reduced

sensitivity of the RMI score in early stage disease.¹⁰ There also appears to be limitations in the RMI score in not only detecting patients with borderline tumours and larger studies are needed to fully understand this relationship.¹²

Conclusion

The RMI 2 score in our setting appears to be a simple and applicable method that can be utilised in the preoperative evaluation of women with ovarian masses. Our study reconfirms its accuracy in detecting malignant disease, but however highlights its limitations in excluding benign masses. We support the development of improved imaging techniques that would aid in this discrimination, as well as judicious use of diagnostic laparoscopy.

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"The doctor of the future will give no medicine, but will educate his patients in the care of the human frame, in diet, and in the cause and prevention of disease."

- Thomas Edison

Why Do We Mess Up and How Do We Brace Up?

Goswami Parijath N
M.B..B.S., M.D, P.G.D. Hospital and Health Management
Professor of Microbiology

It is good to have this conversation because many a times we get upset and get stuck, when certain critical situations arise in our life and we have to deal with it. Many people get panicky and gradually the impact of this finally shades their lives.

We all have knowledge about living a perfect life; the life which gets shaped up by our parent's upbringing, our educational system, the religion we follow, the society we live in, many motivations and training seminars, self-help, literature about great and successful people and so on. And we become professionally and personally acclaimed, praised enthusiastically and publicly, and we are successful in many endeavors, and yet we end up messing up with basic elements of living like for example:

1. We get upset and upset others in life and experience lot of stress.
2. We may be physically unfit or may be over weight.
3. We may be have innumerable strained relationships and limit ourselves. We don't open up and come up with what we want to express and shrink in our thoughts to avoid insults or being vulnerable.
4. We may eventually land up with resentment or we may not take up actions thus missing many opportunities that are there in future.
5. Many a times we may not complete our work that we started or keep procrastinating.

So, where has that zeal and enthusiasm gone? What comes in our way when our zeal and enthusiasm is "Fading" away in taking appropriate actions?

All such situations come up in our day to day life. When we think about them deeply we are at the cross roads and puzzled; which way to go and how to go? We are not coached and trained enough to reliably deal with such issues of life and we land up experiencing guilt, sometimes become victim of circumstances, get frustrated and become resigned, cynical and many a times behave indifferent.

So, to effectively address and deal with such things of our life we need to break our human design. Rather than being at the effect of such situations and circumstances; we need to proactively deal with them. Therefore these are some suggestions that we can practice which will allow us to produce extra-ordinary

results in any area of our efforts:

1. Acknowledging and accepting "What is so" in that area? Not attributing or blaming to the "Reasons" which created the declining results. Simply "Being" with what is so?
2. Being present to the "Impact" on you of this situation in that area and its effect on other areas of life too.
3. Distinguishing what are the obstacles or hurdles or barriers in your "Way" of taking effective actions to produce desired results.
4. What is your "Commitment" to produce successful results?
5. What it would require for you to "Transcend" those obstacles. For example: An ordinary lady might suffer abuse, appear weak and vulnerable and the same lady will turn into a very powerful person who will go beyond her limits to fight and protect her children. She will remove all the hurdles from her way.

Human beings do not follow the structures on regular basis and for long period of time, more so when the initial results are not inspiring. Therefore, we require some practices to have sustainable structures like;

1. Having repetitive reminders. May be in our mobile handset or planner. We may write down at the beginning of the day about different kinds of work to be attended and place written notes at various places; at our place of work or in the house e.g. kitchen, sitting room or near computers or morning notes on the wash basin mirrors.
2. Creating teams around us for support. Our family itself is one team which is aligned to some purpose or some cause.

Now, distinctly look at the following critical steps to create and recreate the tasks that should be taken so that failure, frustrations, irritability, anger etc are dealt with powerfully;

1. Go to the "source" and find out what was the inauthenticity there. Blaming people and circumstances will ultimately drain our energy.
2. Distinguish and acknowledge "what is so"; for example reaching our work place in time - what

are the things that are coming in our way? Then build upon steps necessary to fill the gaps which one has seen.

3. Look for the unfulfilled work against the planned work. If we look at the noticeable impact of unfulfilled and incomplete work we realize that there is -

- Piling up of the work.
- Working long hours to complete it.
- Getting heaped up with fresh assignments.
- Facing stress of answering to seniors.
- Effect of this will also affect the family.

Now lets look at why we fail to produce desired results or not take required actions to produce such results? Let us look into the contemporary human behavioral design. We are by default:

1. Righteous about ourselves at many junctures because :

We have a “point of view” for everything. And there can be many points of view by different people. When we “drift” from “having” a point of view to “becoming” a point of view our survival upholds only our view, not giving “space” for other's points of view. This results in intolerance, conflicts, alteration,

quarrels and lots of stress and resentment. Can we “Have” our point of view rather than “becoming” and strongly adhering to our point of view only ?

By giving “space” to persons working with us we can have opening and discuss things out. Make place for things that we want to achieve as well as make space for future development thus producing successful results.

2. Lack of integrity:

We tend to step over our promises and justify it in view of “reasons” (reasons look very much valid and convincing to us). Thus have casual relationship with our work and promises. This leaves us on very weak foundation of “workability” to create what we want to create.

One can follow the following steps for gracefully achieving success in our work practices:

1. Planning and organizing our scheduled work.
2. Doing it with integrity.
3. Work plan should suit our nature such that it is easy and comfortable to work.
4. Being dedicated and focused to the cause or policy.
5. Being committed to our day to day schedules.

"There is no medicine like hope, no incentive so great, and no tonic so powerful as expectation of something tomorrow."

- Orison Swett Marden

Solution to Crossword Puzzle-I

		¹ H	I	² C	K	M	³ A	N	⁴ A	L	
	⁵ H			E			M		C		⁶ O
⁷ F	E	E	⁸ T	R	C		⁹ L	A	T	E	X
	P			V		¹⁰ R			I		Y
¹¹ C	A	R	C	I	N	O	I	¹² D	N	¹³ R	¹⁴ G
	T			X		B		¹⁵ N			E
¹⁶ M	I	B	¹⁷ G		¹⁸ T	O	T	A	L		¹⁹ N
	T		C			T		V			E
	I		²⁰ P		²¹ P		²² D	²³ E	L	T	A
	²⁴ S	T	O	M	A	L		L			²⁵ R
²⁶ P			²⁷ R		R		²⁸ L	F	T		A
²⁹ I	S	O	T	O	P	E		A		³⁰ O	S

Congratulations to the Winner :

Dr. Heena Chawla, Fellow,
Gynecological Oncology

Answers:

Across:

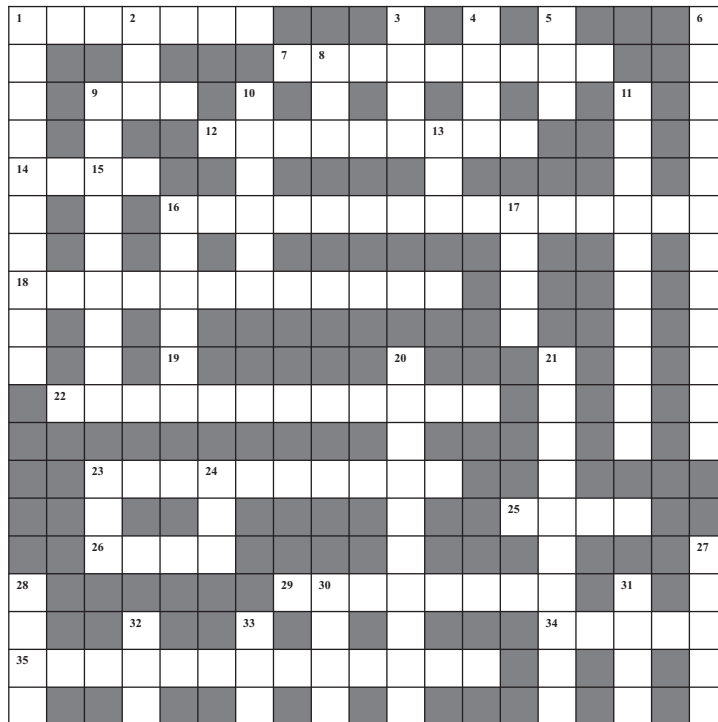
- 1: HICKMAN
- 3: ANAL
- 7: FEET
- 8: TRC
- 9: LATEX
- 11: CARCINOID
- 12: DNR
- 13: RG
- 16: MIBG
- 18: TOTAL
- 22: DELTA
- 24: STOMAL
- 28: LFT
- 29: ISOTOPE
- 30: OS

Down:

- 2: CERVIX
- 3: AML
- 4:ACTIN
- 5: HEPATITIS
- 6: OXYGEN
- 10: ROBOT
- 12: DNA
- 14: GENE
- 15: NAVEL
- 17: GCP
- 19: NEAR
- 20. PORT
- 21: PARP
- 23: ELFA
- 25. RAS
- 26: PI
- 27: RT

Crossword Puzzle-II

Ruchika Verneker,
Department of Gynaecological Oncology



ACROSS :

1. Tumor marker for ovarian granulosa cell tumor (7)
7. Drug of choice for primary hormonal therapy in pre menopausal carcinoma breast (9)
9. Most common virus associated with carcinoma cervix (3-abbrev)
12. Chemotherapeutic agent of choice in concurrent chemoradiation for cancer cervix (9)
14. Part of the body most commonly affected on deep vein thrombosis (4)
16. Gestational trophoblastic neoplasia following full term normal delivery (15)
18. Bone tumor showing codman's triangle and sun ray appearance on x-ray (12)
22. Vascular tumor arising in dermis after breast irradiation or in the lymphedematous upper extremity (12)
23. Most sensitive tumor marker for medullary carcinoma of thyroid (10)
25. Preferred treatment for CIN2 & CIN3 (4-abbrev)
26. Leukaemia known to cause DIC (4-abbrev)
29. Drug of choice for GIST (8)
34. Small blue round cell tumor/sarcoma of childhood involving the diaphysis of the bone most commonly in age group below 10 years (5)
35. Sex cord stromal tumor of ovary that secretes androgen (13)

DOWN :

1. Tumor causing hypoglycaemia with inappropriately increased serum insulin levels with increased c-peptide levels (10)
2. Autoimmune disorder causing platelet destruction (3-abbrev)
3. Colour of urine in Weil's disease (4)
4. Test to detect abnormal areas on suspicious cervix (4-abbrev)

5. Point mutation in _____ proto oncogene causes MEN II syndrome (3)
6. Most common benign tumor of breast in age group of 15-30 years (12)
8. Tumor marker for ovarian endodermal sinus tumor (3-abbrev)
9. Sensitive tumor marker for choriocarcinoma (3-abbrev)
10. Pancreatic tumor causing pancreatic cholera (6)
11. Site for cervical adenocarcinoma (10)
13. Condition in which episode of stroke symptoms last less than 24 hrs (3-abbrev)
15. Biochemical marker for Zollinger Ellison syndrome (7)
16. A group of genetically identical cells or organisms derived from a single cell or individual (5)
17. Most useful diagnostic marker positive in majority of GIST (4)
19. Procedure to deliver oxygen to the patient on ventilator (2-abbrev)
20. Diagnostic and therapeutic procedure in stage IA cervical cancer (10)
21. Metastatic cancer of ovary with characteristic mucin filled signet ring cell on histology (10)
23. Tumor marker for metastasis and recurrence in carcinoma colon (3-abbrev)
24. Characteristic Philadelphia chromosome is found in _____ leukaemia (3-abbrev)
27. _____ treatment regimen used for anal canal cancer (5)
28. Investigation most useful for skeletal involvement in multiple myeloma (4)
30. Nosocomial staphylococcus infection is mostly caused by _____ (4-abbrev)
31. Most common mesenchymal tumor arising from small intestine with CD117 positive (4-abbrev)
32. Preferred imaging modality for brain tumors (3-abbrev)
33. Autoimmune disorder affecting mainly females, causing butterfly rash on the face, multiple organ failure etc. (3-abbrev)

Post Hysterectomy a Rare Case of Large Solid Retroperitoneal Pelvic Leiomyoma

Rathod Nirmal N¹, Chauhan Anjana S², Mankad Meeta H³, Dave Pariseema S⁴, Chawla Heena⁵, Rajan Deepa⁵

Resident¹, Associate Professor², Professor and Unit Head³, Professor⁴, Fellow⁵
Department of Gynaecological Oncology

Summary

Retroperitoneal leiomyomas are considered to be one of the rarest variety and 80% cases are seen in post hysterectomy patients. The patient usually presents with abdominal distension or abdominal pain. With advances in radiological investigatory tools, like ultrasonography, computed tomography and magnetic resonance imaging such cases are identified and reported. Management of such cases include exploratory laparotomy followed by mass removal. We present a case report of a patient who presented to our department with abdominal distension and had past history of hysterectomy for fibroids. With timely diagnosis and surgical expertise patient was managed well.

Introduction

Retroperitoneal leiomyomas are rare. Such masses are huge retroperitoneal lesion of unknown nature.¹ Some extrauterine leiomyomas may mimic malignancies and serious diagnostic errors may result. The most useful modalities for detecting extrauterine leiomyomas are ultrasonography, computed tomography and magnetic resonance imaging.² We are presenting a case of a large retroperitoneal mass mimicking ovarian mass which eventually turned out to be leiomyoma.

Case Report

Mrs.X, a 38 years old female presented to us with complaint of abdominal distension since two years. She had three full term normal deliveries and her last delivery was 16 years back. She had no family history of carcinoma. She had undergone abdominal hysterectomy at teaching institute four years ago by a senior gynaecologist who found two subserous fibroid on right side in the broad ligament intraoperatively. She developed incisional hernia after surgery. Two years ago, she was taken for surgical correction of incisional hernia by a general surgeon at private hospital. At that time, a huge mass was found and the surgery was abandoned. For next two years, patient did not undergo any surgery. She was referred to Gujarat Cancer and Research Institute for a huge mass

with suspicion of malignancy.

On general examination her vitals were stable. On per abdominal examination paraumbilical incisional hernia was present and a large mobile 28 weeks size mass, arising from pelvis was palpable. On per speculum examination, cystocele was present. On per vaginal and on per rectal examination, lower border of same mobile mass was felt in pouch of Douglas.

All hematological investigations and tumor markers such as CA-125: 30.12 U/ml and CEA: 3.66 ng/ml were within normal limit. X-ray chest was normal. Computed tomography of abdomen and pelvis showed presence of 26 x16 x 28 cm size heterogeneously enhancing soft tissue density lesion arising from pelvis extending into abdomen anterior to aorta, displacing bowel loops and bladder anteriorly. There was 4.2 cm gap noted in anterior abdominal wall in umbilical region with herniation of multiple contrast filled small bowel loops and both adnexae were not seen separately from the lesion.

Thus, the patient was planned for exploratory laparotomy. On exploration, there was a huge solid cystic mass 33x30cm size in the pelvis which was adherent to sigmoid colon, descending colon and urinary bladder (Figure 1). This mass was removed followed by left salpingo-oophorectomy, infracolic omentectomy and hernia repair. Post operative period was uneventful. Histopathological report showed leiomyoma with hydropic degenerative changes. Left ovary and fallopian tube were unremarkable. This was further confirmed by immunohistochemistry.

Discussion

Uterine leiomyoma is the most common benign gynecological tumor affecting as many as 25% of women in the reproductive age group and is present in about 80% of all hysterectomy specimens.¹ In addition to the traditional patterns of leiomyomatous growth in the uterus, some unusual extra-uterine growth presentations are; benign metastasizing leiomyoma, disseminated peritoneal leiomyoma, intravenous leiomyomatosis, parasitic leiomyoma and retroperitoneal leiomyoma.² The incidence of retroperitoneal

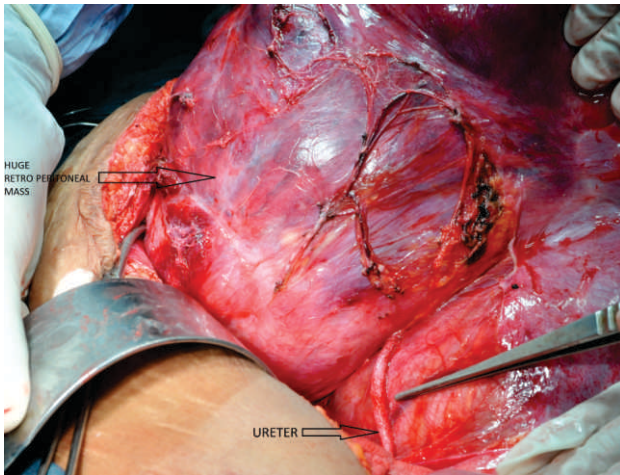


Figure 1: Huge retroperitoneal mass with adhesions.

leiomyoma is quite low and it is even lower for those extending to or originating in the abdomen. Of the reported retroperitoneal leiomyoma, 73% are located in the pelvis.³ Most of the published case reports diagnosed the cases clinically as retroperitoneal growths with high suspicion of malignancy without suspecting their benign nature.^{4,5} In our case, the patient was presented as huge pelvic mass who underwent laparotomy with provisional diagnosis of ovarian mass.

The usual presentation of leiomyoma is abdominal distention. Symptoms of chest pain, shortness of breath, and cough have been described. Although the clinical course is usually indolent, a more rapid progression to severe respiratory symptoms also has been reported. However in our case, patient was presented with abdominal distension without respiratory symptoms.

The origin of such tumors is a puzzling issue with much scientific debate. Poliquin and coworkers observed a 40% association of retroperitoneal leiomyomas with uterine counterparts or a history of hysterectomy due to uterine leiomyoma.⁴ While Stutterecker et al claimed that Müllerian cell rests or smooth muscle cells in the retroperitoneal vessels wall are the putative origin.⁵ Kho KA and Nezhat C proposed an 'iatrogenic' origin for such growths while analyzing a case series of extra-uterine leiomyoma, mostly of retroperitoneal or intraperitoneal location with no visible connection to the uterus.⁶ They found out that 83% of their case series had previous abdominal surgeries and 67% had myomectomies, most of them via laparoscopy.⁷ In our reported case, leiomyoma was retroperitoneal location following

post hysterectomy which was done for multiple fibroids.

The most useful modalities for diagnosis of extrauterine leiomyomas are ultrasonography, computed tomography and magnetic resonance imaging. In addition to it, a history of hysterectomy or the presence of concurrent uterine leiomyoma may be suggestive of the extrauterine leiomyoma.⁸ In our case, preoperative diagnosis of leiomyoma was kept in mind because of past history of hysterectomy for fibroid and indolent nature of the tumour.

Conclusion

Several theories have been postulated regarding the origin of retroperitoneal leiomyoma; however, the exact etiology is still an unexplored issue that merits more investigation. Thus, if post hysterectomy patient is presenting with retroperitoneal mass, then suspicion for leiomyoma kept in mind that facilitates their timely diagnosis and appropriate management.

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Primary Mucinous Adenocarcinoma of Appendix Presenting as Ovarian Mass

Ladumor Kamlesh L¹, Dave Pariseema S², Mankad Meeta H³, Chauhan Anjana S⁴, Chawla Heena⁵, Rajan Deepa⁵

Resident¹, Professor², Professor and Unit Head³, Associate Professor⁴, Fellow⁵
Department of Gynecological Oncology

Summary

Primary tumors of the appendix are rare and most of them are unrecognized preoperatively, presenting as appendicitis, pelvic masses or abdominal pain. We report case of a 71 year old female patient with suspected diagnosis of bilateral ovarian mass. Upon surgical exploration, there was a left ovarian mass with appendicular mass. Histopathological examination revealed the diagnosis of primary mucinous adenocarcinoma of appendix with metastasis in the left ovary. This is an unusual consideration in differential diagnosis of an ovarian mass.

Introduction

Primary adenocarcinoma of appendix is very rare. It comprises less than 0.5% of all gastrointestinal neoplasms. This condition is rarely diagnosed pre operatively. They commonly metastasize to the lymphnodes, liver and lung. Their metastasis to ovary is rare and they mimic advanced ovarian cancer.¹ Women with metastatic ovarian tumors require different therapy and have shortened survival compared to woman with primary ovarian tumor. The identification of a metastatic ovarian tumor is of more than mere academic interest. Misdiagnosing a metastatic ovarian cancer as a primary ovarian cancer may lead to erroneous surgery, incorrect chemotherapy and a delay in diagnosis of the actual primary site.² The present study reports a case of mucin producing adenocarcinoma of the appendix with metastasis to ovary presenting as a pelvic mass.

Case Report

A 71 year old female P₅L₅A₂ presented with complaint of abdominal pain for one month. She had history of abdominal hysterectomy done 25 years ago for menorrhagia. On general examination, vitals were stable and there was generalized pallor. On local examination, 20 weeks sized mobile mass was adherent to vault more on left side. On per rectal examination, rectal mucosa was free and mass felt in pouch of douglas. All hematological investigations

were normal except low haemoglobin (7.8gm/dl). Her tumor marker, serum CA-125 value of 63.70 U/ml, serum CEA value of 14.46 ng /ml, were raised. Ultrasonography showed presence of 13x11x10 cm sized multiloculated cystic lesion with multiple internal septations in left side of pelvis extending into left lumbar region indenting left lateral wall of urinary bladder. Similar lesion of 11x10x9 cm size was noted in right iliac fossa, abutting adjacent bowel loop and indenting right psoas muscle. Risk for malignancy index (RMI) was 512 (RMI > 250 highly suggestive of malignancy).

Provisional diagnosis of ovarian malignancy was made and she was planned for exploratory laparotomy. On exploration, a left ovarian mucinous, sticky mass (Figure1) of about 9 x7 cm was present along with another 11 x 5 cm appendicular mass (Figure 2). Right ovary appeared normal. Hence, the diagnosis of primary mucinous adenocarcinoma of appendicular origin was apparent and oncosurgeon was consulted to decide further management. Since it was advanced malignancy of appendix spreading to left ovary and omentum, decision was taken to remove both the ovarian and appendicular masses with total omentectomy. She had residual tumor at the base of bladder with ureteric involved which was unresectable. Histopathological report showed moderately differentiated primary mucinous adenocarcinoma of appendix, left ovary and omentum showed metastatic mucinous adenocarcinoma. Immunohistochemistry study of tissue was positive for CK20, CEA and negative for CA-125 favouring primary gastrointestinal tract origin of the tumour. Hence, her final diagnosis was mucinous adenocarcinoma of appendix stage-IV. Patient was planned for chemotherapy (5-flourouracil) 4 weekly for six cycles.

Discussion

Mucinous adenocarcinoma of the appendix is the most common cancer of appendix. It accounts for 37% of all appendicular neoplasms. Tumor may grow faster and metastasizes to the lymphnodes, liver and lung.³ Ovarian metastasis from appendicular

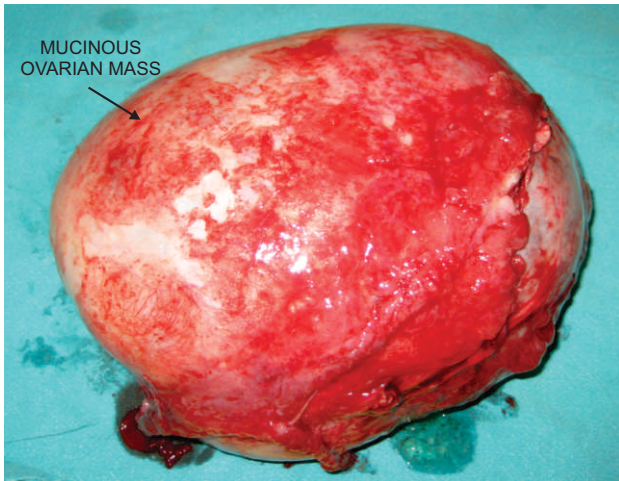


Figure 1: Mucinous tumor of left ovary

carcinoma is rare. Approximately 7% of clinically apparent ovarian malignancies are metastatic neoplasms to the ovary.² Primary adenocarcinoma of appendix is common after fifth decade of life though an incidence of primary adenocarcinoma of appendix is 0.01 to 0.11% of all appendicectomies.

Clinically most of them present as acute appendicitis or appendicular mass. Patient may present with lower abdominal pain mimicking appendicitis or can also be asymptomatic. Occasionally patient may present with melena or perforation. Our patient presented with a pelvic mass mimicking primary ovarian malignancy.

Malignancy of appendix is never suspected pre operatively. Diagnosis is usually made by histopathological report. In our case underlying pathology was advanced primary mucinous adenocarcinoma of appendix metastasising to the ovary and omentum. Mucinous cystadenocarcinomas are usually well differentiated neoplasms and gross morphology of this tumor is a mucocoele. If there is concomitant ovarian mass it might be difficult to determine primary site. Histologically adenocarcinoma may have mucinous or colonic glands. Rarely cystadenocarcinoma pseudomyxoma peritonei may occur.

Once diagnosed as mucinous cystadenocarcinoma either by frozen section intraoperatively or by histopathologically, right hemicolectomy has been accepted as definitive therapy.⁴ Surgical removal of tumor when detected early is said to offer cure. Ten year survival after right hemicolectomy has been found to be 65% in contrast to 37% in patients subjected to appendicectomy alone.¹ Peritoneal carcinomatosis associated with ovarian metastasis from colorectal and appendicular cancer has been treated using aggressive resection followed by intraoperative chemotherapy. In patients where

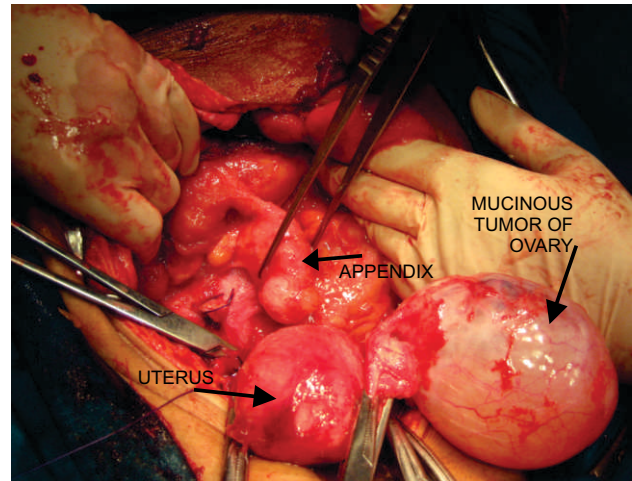


Figure 2: Appendicular mass with left ovarian tumor

complete debulking was possible the median survival was 108 months but only 30% were completely debulked.⁵ Prognosis is better in mucinous type appendicular carcinoma than in the colonic type. Pseudomyxoma peritonei has bad prognosis.

Conclusion

Appendiceal neoplasms are usually diagnosed when patient present with pain, mass in right iliac fossa or intestinal obstruction. Interestingly, in this case bilateral ovarian mass turned out be an appendicular mass and left ovarian mass. Her right ovary was normal. Risk for malignancy index is a guide to the clinician to direct the patient to a cancer institute. This case reaffirms the fact that thorough examination of the abdominal viscera at the time of surgery can give an accurate diagnosis.

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A Rare Case of Pyomyoma Mimicking Ovarian Malignancy

Basra Minu B¹, Desai Ava D², Patel Shilpa M³, Patel Bijal M⁴, Parekh Chetana D⁵

Fellow¹, Professor and Head of Unit², Professor³, Assistant Professor⁴, Junior lecturer⁵
Department of Gynecological Oncology

Summary

Uterine leiomyomas are very common. In rare cases, large fibroids can undergo infarction and infection leading to pyomyoma or suppurative leiomyoma. It is a rare but serious complication of uterine leiomyomas, which may even mimic malignancy. There may be delay in diagnosis due to rarity of pyomyoma, which leads to increased morbidity and mortality. Thus, the diagnosis of pyomyoma, although very rare, should be borne in mind in patients with large abdominal masses who develop unexplained fever or abdominal pain. We report a case of a 45-year-old woman who presented with abdominal distension, pain and fever for one month. Ultrasound (USG) showed large mixed solid cystic mass with multiple internal septations occupying whole of abdomen and pelvis, uterus and bilateral ovaries could not be seen separately. Provisional diagnosis of ovarian cancer was made and surgery was planned. At laparotomy, she was found to have a large pyomyoma arising from uterine fundus which was successfully removed by total hysterectomy. On the 13th postoperative day, she developed watery diarrhea, abdominal distension, electrolyte imbalance. The condition of patient continued to deteriorate despite the best efforts. She left against medical advice.

Introduction

Uterine leiomyomas are very common. Small leiomyomas are present in more than 20% of women over the age of 40 years, which usually remain asymptomatic.¹ Thus the recommendation in most women with fibroids in the perimenopausal period is to be usually conservative.

In rare cases, large fibroids can undergo infarction and infection leading to pyomyoma or suppurative leiomyoma. The triad of: bacteremia or sepsis, leiomyoma uteri and no other apparent source of infection, should suggest the diagnosis of pyomyoma.² It is a rare but serious complication of uterine leiomyomas, which may even mimic malignancy and can result in a clinical dilemma. It can evoke both diagnostic and therapeutic difficulties,

leading to potential complications, such as bacteremia, uterine rupture, and even death.

We describe herein a rare case of spontaneously occurring pyomyoma in a premenopausal female.

Case Report

A 45 year old lady, P5L5, was referred to our centre in view of a suspected ovarian malignancy. She was previously admitted to a private hospital before one month, with complaints of abdominal pain and distension, decreased appetite, fever, breathlessness and weight loss. Patient had normal, regular menses. Computerized tomography (CT) scan revealed a large multiloculated cystic lesion with internal septations and soft tissue component filling the pelvis and right half of abdomen.

Patient was pale to look and bilateral pitting pedal edema was present on clinical examination. On abdominal examination, there was gross abdominal distension extending from pubic symphysis to xiphisternum. Vaginal examination did not reveal any mass. Ultrasound (USG) showed large mixed solid cystic mass with multiple internal septations occupying whole of abdomen and pelvis, uterus and bilateral ovaries could not be seen separately.

Routine hematological investigations revealed hemoglobin (Hb) of 6.4gm% (normal range 11-15 g/dL), total leucocyte count (TLC) 19,200/cumm (normal range 4000 -11000/cumm) and CA 125 levels of 69.44 U/ml (normal range up to 35 U/ml). Her platelet count, liver function tests and renal function tests were essentially normal. Provisional diagnosis made was of infected ovarian cyst. Patient was empirically started on parenteral antibiotics. Preoperatively, she required five units of packed cell transfusion.

On exploration, through a vertical left paramedian incision, small bowel and greater omentum were found to be densely adherent to anterior peritoneum and over the mass. By a combination of blunt and sharp dissection, the mass was freed from the adhesions, but in the process, capsule was inadvertently breached and copious

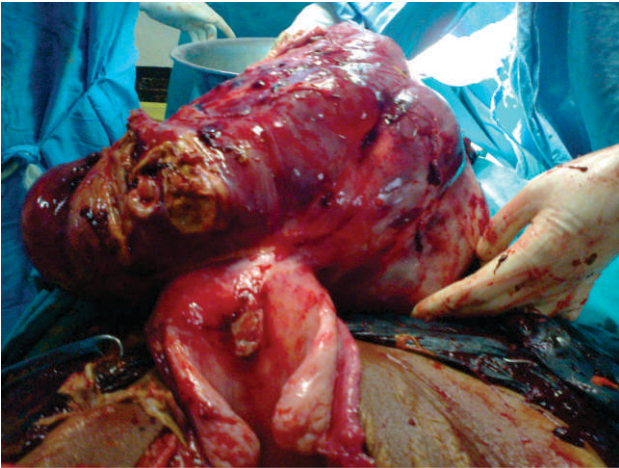


Figure 1 : Uterus with pyomyoma

amounts of purulent malodorous fluid (pus) and necrotic material oozed from it. This was suctioned and sent for culture and sensitivity. After adhesiolysis, a 40×30×40 cm solid cystic mass was seen arising from the fundus of the uterus extending from pelvis to epigastrium and partly occupying bilateral hypochondrial quadrants and bilateral flanks. Uterus was enlarged in size. Bilateral fallopian tubes and ovaries were normal (Figure 1).

Dense adhesions were found between the mass and distal small bowel and mesentery. While separating adhesions, proximal ileum was damaged, thus 10 cm of ileal resection was done with primary ileo-ileal anastomosis. Total abdominal hysterectomy with bilateral salpingo-oophorectomy was done. Closed abdominal drain was placed in pelvis and abdominal closure was done. Intraoperatively, the patient was transfused two units of blood. Pus cultures showed growth of *Escherichia coli* sensitive to Imipenem and fungal growth of *Candida* sensitive to fluconazole. These drugs were administered in the postoperative period. Patient made rapid recovery. The abdominal drain was removed on tenth postoperative day. She was afebrile with normal bowel and bladder functions. Injectable imipenem and fluconazole were withdrawn.

Histopathology report revealed leiomyoma arising from the uterine fundus measuring 32 cm×30 cm×6 cm. It showed hydropic cystic changes and secondary changes due to infection and abscess formation. Uterus, ileal segment, bilateral tubes and ovaries were found to be normal and had no evidence of malignancy.

On the 13th postoperative day, the patient complained of passage of 4 – 5 episodes of watery stools and fullness of abdomen. On examination, abdominal distension was present. Peristalsis was present on auscultation. USG showed mild ascites and diffuse wall thickening of rectosigmoid and large bowel upto caecum and terminal ileum. There were no

dilated bowel loops or air fluid levels on X ray abdomen. Stool routine microscopy showed occult blood in stools. Stool culture showed normal gut flora. Her serum potassium (K^+) was 2.0 mmol/L (normal range 3.5 – 5.1 mmol/L), calcium (Ca^{2+}) was 6.85 mg/dl (normal range 8.4 – 10.5 mg/dl). Potassium and calcium replacement was started. On 15th postoperative day, there was no improvement in diarrhea (stool microscopy and USG findings), patient was started on injectable ciprofloxacin and metronidazole. She was kept nil by mouth for two days and then oral clear fluids were started. Due to persistent low levels, electrolyte replacement was continued.

Patient's symptoms did not improve inspite of higher antibiotics and she developed fever. Her Hb was 7.3 gm% and TLC was 6,600/cu mm. Repeat ultrasound was done, which showed matted bowel loops adherent to each other with few pockets of organized collection, collection noted under anterior abdominal wall on right side. Sluggish blood flow was noted in bilateral iliac vessels. Hence she was started on injectable piperacillin-tazobactam, tablet warfarin and injection heparin and one unit blood was given. She was given seven days of piperacillin-tazobactam but her condition did not improve. On 30th postoperative day her stitches were removed. Patient left against medical advice and never turned up for follow up.

Discussion

Pyomyoma (suppurative leiomyoma of the uterus) is a rare occurrence in the postantibiotic era. Prior to the usage of antimicrobials, 75 cases of pyomyoma were reported between 1871 and 1945 as compared to just 15 cases being reported since then.²⁻⁷

Pyomyoma is a very serious and rare complication of uterine leiomyoma associated with a high fatality rate of about 21%.⁸ It is usually caused by infarction and subsequent infection of an infarcted leiomyoma.⁹ Due to the rarity of this condition, these cases are usually misdiagnosed as ovarian masses.

Various possible routes of spread of infection for the development of pyomyoma have been described.² Contiguous spread can occur from the endometrial cavity, adjacent bowel or adnexa. Hematogenous or lymphatic spread from infection elsewhere in the body is also a described possible route.² The triad of bacteraemia or sepsis, leiomyoma uteri and no other apparent source of infection should suggest the diagnosis of pyomyoma.

It is commonly seen in pregnant or postmenopausal women. Pyomyoma during pregnancy (degeneration followed by infarction and secondary infection) is probably due to the rapid growth of uterine leiomyoma due to various hormonal

changes occurring during pregnancy. Ascending infection can accompany either spontaneous abortion or abortion involving uterine instrumentation.⁴ Postmenopausal women are at high risk of pyomyoma due to associated vasculopathy (diabetes and hypertension).²

The present patient was nondiabetic and nonhypertensive and did not have any history of intervention to suggest a possible portal of infection. The patient had giant leiomyoma, thus leiomyoma necrosis due to vascular insufficiency may have been the predisposing factor for the development of pyomyoma. In another previously published case report, similar to the presented case, a diabetic postmenopausal woman with a giant pyomyoma simulating an ovarian cancer was described.⁷ The diagnosis in that case was also based on intra-operative findings as the CT scan had described the presence of a multicystic mass arising from the pelvis. The patient also had a mildly raised CA 125 as was seen in the present case.

The disease has a high fatality rate. Only surgical intervention has been found to be life saving. The condition may be difficult to diagnose, especially in those patients with a nonspecific clinical presentation without any complaints suggestive of leiomyoma. Any delay in diagnosis may result in serious complications, whereas early adequate surgery and broad-spectrum antibiotics may decrease serious morbidity and mortality.¹⁰ The present patient had presented quiet late in her course of illness. Her general condition had significantly deteriorated resulting in increased morbidity in postoperative period.

Pyoperitoneum, septicemia and adult respiratory distress syndrome are life-threatening complications associated with this condition.⁸ Even, in the present day era of broad-spectrum antibiotics, early surgical intervention is essential and is the most definitive cure of pyomyoma uteri. Adverse outcomes may occur due to a missed or delayed diagnosis due to the rarity of the condition.

Conclusion

In conclusion, the diagnosis of pyomyoma, although very rare, should be borne in mind in patients

with large abdominal masses who develop unexplained fever or abdominal pain. A high index of suspicion can help in the early diagnosis and prompt treatment of an otherwise fatal condition.

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“More people live off cancer than die from it.”

- Dr. Deepak Chopra

Primary Fallopian Tube Carcinoma, Presenting as Uterine Malignancy

Chikani Jenil J¹, Mankad Meeta H², Dave Pariseema S³, Chauhan Anjana S⁴, Chawla Heena P⁵, Rajan Deepa⁵

Resident¹, Professor and Unit Head², Professor³, Associate Professor⁴, Fellow⁵
Department of Gynecological Oncology

Summary

Primary fallopian tube carcinoma is one of the rarest gynaecological cancer. Mostly it presents as ovarian malignancy and rarely as uterine malignancy. It is often misdiagnosed in radiological and clinical examination. Here we present a case who was preoperatively misdiagnosed as uterine malignancy and then finally diagnosed as primary fallopian tube carcinoma.

Introduction

Primary fallopian tube carcinoma is one of the rarest of the gynaecological malignancies accounting for 0.14 to 1.8% of all female genital tract malignancies.¹ It is possible that its true incidence has been underestimated because it may be misdiagnosed as epithelial ovarian cancer, clinically during surgery and even histopathologically due to almost identical histological appearance of these two malignancies due to their common mullerian origin. Preoperative diagnosis is often missed due to its diagnostic confusion with tuboovarian mass, hydrosalpinx, ectopic pregnancy and ovarian malignancy. It is uncommon in Indian subcontinent due to high parity which is considered to be a protective factor. Although the etiology of tumor is unknown, it has been shown to be associated with chronic tubal inflammation, infertility, tuberculous salpingitis and tubal endometriosis. The Latzko's classical triad consists of profuse serosanguineous vaginal discharge, colicky abdominal pain relieved by discharge and pelvic mass. This triad has been reported in only 15% of cases.² Hydrops tubae profluens, a pathognomic feature, implies intermittent discharge of clear or blood-tinged fluid spontaneously or on pressure followed by shrinkage of an adnexal mass and occurs in 5% of patients. In many patients, fallopian tube carcinoma is asymptomatic. The other symptoms are abnormal vaginal bleeding or post menopausal bleeding, sensation of pressure on bowel or bladder and a sensation that the bowel and bladder can not be completely emptied. However clinical examination still may not enable preoperative diagnosis, sonographic features of the tumor are non-specific

and include the presence of a fluid-filled adnexal structure with a significant solid component, a sausage-shaped mass, a cystic mass with papillary projections within, a cystic mass with cog wheel appearance and an ovoid-shaped structure containing an incomplete separation and a highly vascular solid nodule and so intraoperative inspection becomes very important. More than 80% of patients have elevated pretreatment serum CA-125 levels, which is useful in follow-up after the definite treatment. Here we present a case which was diagnosed as carcinoma endometrium in pre operative investigations and dilatation and curettage but intraoperatively and histopathologically it turned as primary fallopian tube carcinoma.

Case Report

A 55 years old postmenopausal woman P5L5A0 presented with whitish discharge per vaginal since 2 months. Patient was a known hypertensive since 6-7 years and well controlled on antihypertensives. Outside dilatation and curettage revealed well differentiated endometrial carcinoma. On examination, cervix was pulled higher up flushed to vagina, bilateral parametrium were free. PAP smear showed adenocarcinoma, while endocervical curettage was negative for malignancy. Slide for review showed moderately differentiated endometriod adenocarcinoma. Sonography at GCRI revealed enlargement with multiple well defined lesion in endometrial cavity adherent to wall possibility of polyps with mild endometrial collection with no evidence of adnexal mass. MRI showed polypoidal lesion in endometrial cavity with moderate endometrial collection, possibility of endometrial polyps with likely cervical stenosis. Multiple fibroids were noted in uterus, largest measuring 30x30x32 mm. CA-125 was normal. Patient was planned for laparotomy with a provisional diagnosis of carcinoma of endometrium. She underwent staging laparotomy followed by total abdominal hysterectomy and bilateral salpingo-oophorectomy with bilateral pelvic lymph node dissection and infracolic omentectomy. Intraoperatively uterus was bulky and bilateral

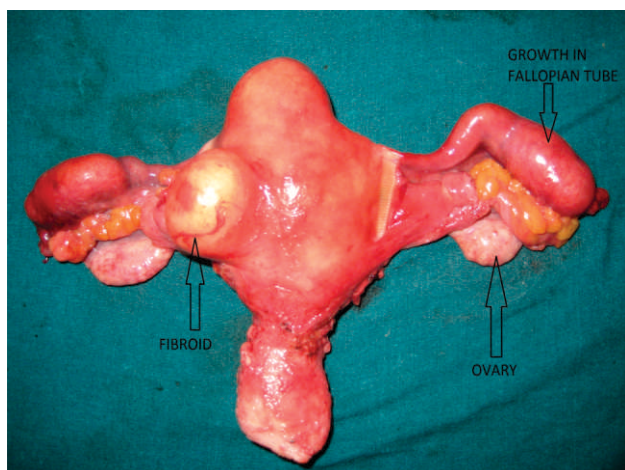


Figure 1: Anterior surface of specimen

fallopian tubes were enlarged (Figure 1-2). In gross histopathological examination, gray white firm smooth proliferative fragile growths (3 x 2 x 1 cm in right fallopian tube, 3.8 x 2.8 x 2 cm in left fallopian tube and 2 x 1.5 x 0.5 cm in uterus) were identified, which was involving endometrium and lower uterine cavity. Three fibroids were identified on uterus. Histopathology report was moderately differentiated bilateral fallopian tube adenocarcinoma, infiltrating up to outer muscle layer with secondary involvement of endometrium. It involved less than ½ thickness of uterine wall and extends to lower uterine segment. All pelvic lymph nodes, ovaries, cervix and omentum were free of tumor with negative fluid cytology and without any lymph vascular and perineural invasion. She was finally diagnosed as a case of fallopian tube carcinoma stage IIa. She has been advised 6 cycle of combination chemotherapy (paclitaxel and carboplatin) and is doing well.

Discussion

The etiology of primary fallopian tube carcinoma is unknown. Hormonal, reproductive, and possibly genetic factors thought to increase risk. High parity has been reported to be protective and a history of pregnancy and the use of oral contraceptives decrease the primary fallopian tube carcinoma risk significantly. It has been reported that there is no statistically significant correlation between primary fallopian tube carcinoma and age, race, weight, education level, pelvic inflammatory disease, infertility, previous hysterectomy, endometriosis, lactose intolerance or smoking.³ Primary fallopian tube carcinoma most frequently occurs between the fourth and sixth decades of life with a median age of occurrence of 55 years (range 17–88 years).⁷ However, it has been reported in young girls aged 17–19 years. Cancer can begin in any of the different cell types that make up the fallopian tubes, and the most common type is adenocarcinoma (a cancer of

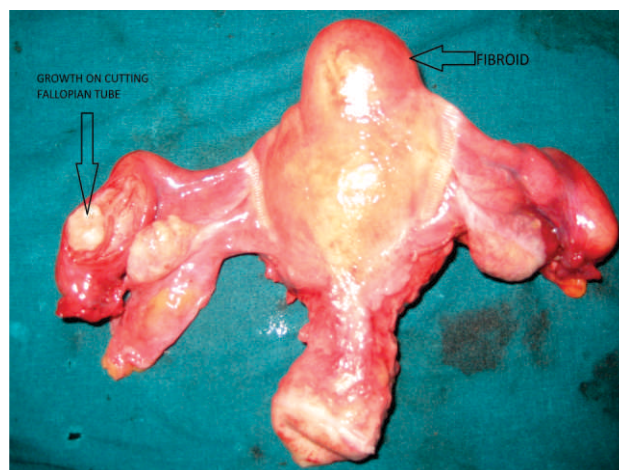


Figure 2: Posterior surface of specimen

cells from glands). Leiomyosarcoma (a cancer of smooth muscle cells) and transitional cell carcinoma (a cancer of the cells lining the fallopian tubes) are less common. Cytogenetic studies show the disease to be associated with over expression of p53, HER2/neu and c-myb. There is also some evidence that BRCA1 and BRCA2 mutations have a role in tumorigenesis. In many cases, the preoperative diagnosis of primary fallopian tube carcinoma is extremely rare. In view of radiological findings, dilatation and curettage histopathological examination, we put diagnosis of carcinoma of endometrium. Patient's clinical profile also favoured this diagnosis, but intra operative findings and histopathology report revealed that it was a primary fallopian tube carcinoma which was metastasized to endometrium. The fallopian tubes are commonly involved in patients who have neoplasms metastatic to the ovaries. Metastases may show a carcinoma in situ-like pattern of intra-epithelial spread and therefore small serous carcinoma in situ-type lesions may not represent proof of tubal tumor origin in patients who have high-stage pelvic serous carcinomas. The frequency of intra-luminal tumor cells supports transtubal spread as a likely mechanism for mucosal involvement by metastatic tumors involving the lower genital tract.⁴

Diagnostic criteria to differentiate fallopian tube malignancy from other primary malignancies were established by Hu in 1950 and modified by Sedlis in 1978 are now generally followed : 1. the tumor arises from the endosalpinx; 2. the histological pattern reproduces the papillary features of the tubal epithelium; 3. transition from benign to malignant epithelium is demonstrable; 4. the ovaries and endometrium are either normal or contain smaller tumors than the tubes. Based on above criteria our patient was diagnosed as primary fallopian tube carcinoma.⁵ Our patient had uterine metastasis because primary fallopian tube carcinoma spreads primarily by transcoelomic exfoliation of cells.

Although spread by contagious invasion, transluminal migration and lymphatics or hematogenous dissemination is also common. So her dilatation and curettage report and PAP showed malignancy. Bilateral tubal involvement is seen in 31.8% cases. On routine lymphadenectomy, metastasis to lymph nodes has been documented in 53% of patients with advanced disease and is equally distributed in pelvic and para aortic regions.⁶ Pre operative serum CA-125 levels were >35 U/ml in 58.7% of stage-I and II disease and 94.7% of stage-III and IV diseases. The lead time (elevated serum CA125 level prior to clinical and radiological diagnosis) ranges from 0.5 to 7 months in primary fallopian tube carcinoma. Thus serum CA125 is a useful tumor marker for the assessment of response to treatment and early detection of recurrence, but it is not diagnostic for primary fallopian tube carcinoma per se.^{6,7} This patient's CA-125 was normal and didn't serve as a tumor marker.

Patients in whom previous scan suggested adnexal tumor in two dimensional ultrasound addition of three dimensional power doppler examination with transvaginal sonography depicted vascular geometry typical for malignant tumors, concluded that they may aid in pre operative diagnosis.² Surgery is the treatment of choice for primary fallopian tube carcinoma. Surgical principles are the same as those used for ovarian cancer. Aggressive cytoreductive surgery with removal of as much tumor as possible is warranted in patients with advanced disease. If it is impossible to achieve optimal debulking despite maximum effort, surgery should be attempted again after a few courses of chemotherapy. Very aggressive forms of surgery should only be considered in highly individualized patients. Considering the strong tendency for lymphatic spread of the tumor, a systematic pelvic and para-aortic lymphadenectomy is preferred to lymph node sampling. In advanced disease, the bulk of extra-tubal disease and postoperative residual disease >2 cm are adverse prognostic factors⁵. Limited surgery can be considered for young patients who want to retain fertility, patients with an in situ carcinoma and in those women with stage I and grade I carcinoma⁷.

Although radiotherapy has been used traditionally in the past as an adjuvant therapy for primary fallopian tube carcinoma, its role in the era of effective chemo-therapy is less well defined and controversial. In view of its low efficacy and high rate of serious complications, the use of postoperative radiotherapy in the treatment of patients with primary fallopian tube carcinoma is no longer recommended. Platinum based chemotherapy is most commonly

used chemotherapy for this patient. On cisplatin based chemotherapy, the complete and partial responses were 64.4% and 17.8% respectively with a 5 year survival rate of 56% in complete responders. Five year survival rate is 50-60% in stage II disease.⁶

Conclusion

Primary fallopian tube carcinoma is a rare tumor accounting for <1% of all female genital tract cancers. Histologically and clinically, it resembles epithelial ovarian cancer. The diagnosis of primary fallopian tube carcinoma is rarely considered preoperatively and is usually first appreciated at the time of operation or by a pathologist. Both carcinomas have a similar age distribution, are more common among nulliparous women, and are often of serous papillary histology. Surgery should consist of total abdominal hysterectomy, bilateral salpingo-oophorectomy, omentectomy, and lymph node dissection from the pelvic and para-aortic regions. Aggressive debulking surgery should be attempted in patients with advanced disease. It has a poor prognosis with stage and residual tumor size and responds to platinum-based chemotherapy. Stage and residual tumor are the most important prognostic factors for outcome.

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Growing Teratoma Syndrome: A Case Report

Jain Payal¹, Desai Ava D², Patel Shilpa M³, Patel Bijal M⁴, Parekh Chetna D⁵

Fellow¹, Professor and Unit Head², Professor³, Assistant Professor⁴, Junior Lecturer⁵
Department of Gynecological Oncology

Summary

Almost all cases of immature teratoma require adjuvant chemotherapy after surgery. An enlarging intraperitoneal mass despite chemotherapy rarely may be due to treatment failure. However, Growing Teratoma Syndrome (GTS) must be kept in mind. We present a case of a young woman with immature teratoma whose tumor size increased despite chemotherapy. Surgical resection was done and histopathological examination revealed mature teratoma. The patient was diagnosed as a case of GTS. Though rare, GTS must be kept in mind if tumor size increases during chemotherapy, in order to avoid mismanagement.

Introduction

GTS is defined as an increase in tumor size in a patient with germ cell tumor during or after chemotherapy, while tumor markers are normal and histology shows only mature teratoma.¹ In 1982, Logothetis et al first coined term GTS.² Disaia et al in 1977, described this phenomenon as “chemotherapeutic retroconversion”.³ Later it was understood that the two terminologies are synonymous. GTS is seen in 1.9-7.6% testicular non seminomatous germ cell tumors after chemotherapy.^{2,4} However GTS originating from ovarian germ cell tumor is very rare.

We report a case of GTS with Gliomatosis Peritonei (GP) in a 26 year old woman following adjuvant chemotherapy for malignant ovarian germ cell tumor.

Case Report

In November 2011, a 26 year old lady was referred to our institute with a large ovarian mass. The patient had undergone exploratory laprotomy with ovarian mass removal and omental sampling three months earlier. Histopathological examination had documented mature teratoma with granulomatous inflammation of omentum.

At presentation, the patient was of average build and nourishment. Abdominal examination revealed distention and an irregular mass in iliac fossa. Her vaginal and rectal examination revealed an irregular nodular mass in pouch of douglas.

Ultrasonography (USG) showed a large, complex, predominantly solid mass in the pelvis and lower abdomen with significant ascites. Her serum markers were: alpha feto protein (AFP) 1253.0 ng/ml (normal up to 15.0 ng/ml), cancer antigen 125 (CA-125) 1860.0 U/ml (normal up to 35 U/ml), beta human chorionic gonadotrophin (β -hCG) 23.38 IU/L (normal <5.0 IU/L) and lactate dehydrogenase (LDH) 975 IU/L (normal 266-500 IU/L). Review of histopathological slides showed mature teratoma with foci of immature neuroepithelium suggestive of immature teratoma grade 1. Hence, she was diagnosed as recurrent malignant germ cell tumor and was treated with chemotherapy (cisplatin 20 mg/m², etoposide 100 mg/m² and bleomycin 30 units).

Post chemotherapy, there was significant reduction in levels of serum tumor markers (AFP 113.8ng/ml, CA-125 90.54 U/ml and LDH 517 IU/L). On per abdominal examination there was an irregular, hard mass up to umbilicus. Vaginal and rectal examination showed a huge mass pressing on rectum. The rectal mucosa was free. USG showed a large 13×18 cm lesion with heterogeneous echo texture and internal cystic areas, arising from pelvis and extending into lower abdomen. Another, 17×18 mm mixed echogenic lesion was seen on diaphragmatic aspect of liver, suggestive of a peritoneal deposit.

This indicated that inspite of a very good biochemical response there was progressive disease both clinically and radiologically. Hence the decision of exploratory laparotomy was made. On exploration, a large left ovarian mass was seen adherent to intestinal loops. Multiple large peritoneal deposits of around 4-5 cm were present on the serosa of urinary bladder, rectum and in the omentum. There was also extensive disease on the peritoneum of right hemidiaphragm. Frozen section of ovarian mass and peritoneum revealed mature teratoma with GP component in the peritoneal sample. As the frozen section showed mature teratoma, GTS was suspected and the decision was made to perform optimal cytoreduction, inspite of increased risk of morbidity. This decision had to be taken as patients with GTS do not respond to further chemotherapy. The entire peritoneum over right hemidiaphragmatic area

resected after mobilizing liver. Supracolic omentectomy was done. The deposits over serosa of urinary bladder and sigmoid colon were removed. In spite of the extensive disease, the uterus and right adnexa were clinically normal and were preserved. Optimal cytoreduction could be achieved.

The final histopathology report showed mature teratoma with GP. No immature components were present. Her postoperative USG and tumor markers (β -hCG 6.01 IU/L, AFP 12.85 ng/ml and LDH 497.0 IU/L) were normal. The diagnosis of GTS was thus established.

Further chemotherapy is not usually indicated in case of GTS. However, in this case, as the tumor markers were still mildly elevated before surgery, the medical oncologist decided to treat her with further chemotherapy. She was started on Paclitaxel 250 mg/m², Ifosfamide 1 gm/m² and Cisplatin 60 mg/m² (TIP). She has completed 4 cycles of TIP and her last Computerized Tomography (CT) scan was normal. The patient is on regular follow up.

Discussion

GTS is a rare complication of malignant ovarian germ cell tumor. The definition of GTS requires three criteria: 1) Clinical or radiological enlargement of metastases during or after chemotherapy, 2) Normalization of previously elevated tumor markers (AFP, β -hCG, LDH) and 3) Histology of resected metastases revealing only mature teratoma without malignant cells.⁵

Two etiopathogenic mechanisms for the occurrence of this syndrome have been proposed: 1) Selective destruction of the malignant component of immature teratoma as a result of chemotherapy and persistence or progression of chemoresistant benign mature teratomatous elements and 2) Spontaneous differentiation of malignant cells into benign tissues (chemotherapeutic retroconversion).³

Hong WK et al⁶ proposed that an inherent and spontaneous differentiation of malignant cells into benign tissues occurs. This hypothesis further implies that chemotherapy prolongs the course of the disease (i.e. the patients survive long enough) to permit "spontaneous evolution" to occur.

The hallmark feature of GTS is the normalization of tumor markers.² In cases where the tumor markers are not entirely in the normal range, it is imperative to exclude any non-malignant etiology (i.e. elevated AFP from liver dysfunction, elevated β -HCG from marijuana use or from elevated luteinizing hormone).⁷ In our case, the patient's AFP was elevated preoperatively but her liver function tests were normal and there was no other detectable cause for raised AFP level. Despite marginally elevated level of AFP, preoperatively, patient was diagnosed as having GTS

as the other criteria were fulfilled.

Optimal cytoreduction is the recommended and the only treatment of GTS. Chemotherapy and radiotherapy have no role in case of residual masses of GTS left behind after surgery.^{2,3} In our case optimum cytoreduction could be achieved with extensive upper abdomen and pelvic surgery. Uterus and right adnexa were clinically normal, so were preserved in this young patient.

If this syndrome is misdiagnosed as progressively malignant Germ Cell Tumor, it may often be mismanaged with second line chemotherapy and valuable time may be lost.

GTS is known to have rapid increase in tumor volume and risk of obstructive complications. Once the tumor is very large and in an advanced phase, surgery becomes difficult and perhaps impossible.⁸ Eventual prognosis is highly dependent on timely diagnosis. It is imperative to perform an adequate and total resection because GTS recurrence is impressive, with reported rates of 72-83% in patients with partial resections versus 0-4% in those who undergo complete resections.⁹

GP, the miliary implants of mature glial tissue on the peritoneum, is an infrequently reported complication of ovarian teratoma.¹¹ It has been found to occur almost exclusively in women with ovarian teratomas, though there are stray reports of its association with pregnancy and ventriculoperitoneal shunts performed for hydrocephalus. The mechanism of implantation is unknown and two theories have been proposed to explain the origin of GP. In one, glial implants arise from the teratoma, whereas in the other, pluripotent stem cells in the peritoneum or subjacent mesenchyme undergo glial metaplasia.¹⁰

GP should be completely resected for two reasons: confirmation of diagnosis and therefore the exclusion of malignancy, but also the prevention of malignant transformation of residual lesions. In our patient extensive upper abdomen and right hemidiaphragmatic peritonectomy was done. Complete excision is often impossible, given the extent of the lesions. Residual unresected GP lesion must be closely monitored with imaging such as CT scans and with tumour markers.

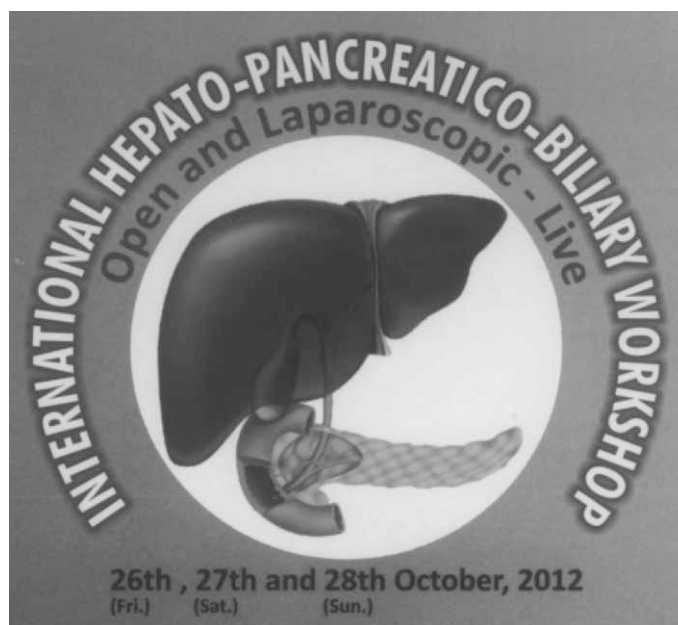
Conclusion

GTS is a rare clinical phenomenon. Complete resection is usually curative and renders better prognosis. Extensive surgical resection may be required to achieve complete cytoreduction. Fertility preserving surgery can be done if the organs are normal but close follow up is essential. In our case the patient is on regular follow up and continues to be disease free.

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Squamous Cell Carcinoma of the Middle Ear: A Case Report

Chaudhari Nitin L¹, Parikh Bharat J², Shukla Shilin N², Panchal Harsha P³, Parekh Bhavesh B⁴, Anand Asha S², Shah Sandip A³, Patel Apurva A³, Talati Shailesh. S², Parikh Sonia K³, Bhatt Shivani J⁴

Resident¹, Professor², Associate Professor³, Assistant Professor⁴
Department of Medical and Pediatric Oncology

Summary

Forty eight year old female with squamous cell carcinoma of the left middle ear mimicked chronic suppurative otitis media (CSOM). She was treated with surgery, radiotherapy and chemotherapy. The literature is reviewed.

Introduction

Middle ear squamous cell carcinoma is a rare tumour. It has poor prognosis and early diagnosis is rare. Surgery is the mainstay of treatment with or without radiotherapy. Chemotherapy is reserved for advanced or recurrent disease. Here is a case report of 48 years female presenting as chronic suppurative otitis media (CSOM) turned out to be a case of squamous cell carcinoma of middle ear.

Case Report

A 48 year old female patient presented with intermittent foul smelling left ear discharge for two years. She had left seventh nerve lower motor neuron facial palsy since 7 months. Her computed tomogram (CT scan) of paranasal sinus (PNS) showed a soft tissue swelling in left middle ear cavity, left external auditory canal. There was erosion of facial nerve canal, ossicular chain and anterior bony wall of external auditory canal. There was also extension into mastoid antrum. Suspected to have chronic suppurative otitis media (CSOM) she was considered for left modified radical mastoidectomy. Under general anaesthesia through post aural incision, tissues were separated, McEvan's triangle was identified and mastoid antrum was approached. The antrum was full of granulation tissue with facial ridge broken and lowered. The entire structure was converted into a single cavity, meatoplasty was done and the wound was closed.

The histopathological examination showed

poorly differentiated squamous cell carcinoma. She did not receive any adjuvant therapy. Following surgery she had persistent left seventh nerve lower motor neuron facial palsy without any ear discharge for 3 months. After 3 months of surgery she had again foul smelling intermittent ear discharge from left ear. Suspected to have recurrent disease, she was referred to a tertiary cancer centre.

At GCRI the CT scan showed a soft tissue density in external auditory canal and ear cavity with the destruction of middle ear ossicles and wing of sphenoid bone and petrous part of temporal bone. The lesion filled entire middle ear cavity with erosion of mastoid antrum and extension into left temporal lobe. (Figure 1-2). She received palliative radiotherapy of 30 Gy/10# without symptomatic relief.

Post radiation therapy she received palliative combination chemotherapy containing Cisplatin and 5-Fluorouracil. (Cisplatin 50 mg/m² on day 1 and 2, 5-Fluorouracil 750 mg/m² on day 1 to 4, Cycle repeated every 21 days). After two chemotherapy cycles Magnetic Resonance Imaging (MRI) brain showed a 27 x 17 x 15 mm residual mass on antero superior aspect of left external auditory canal. The lesion involved middle and inner ear. There was erosion of base of skull in left middle cranial fossa and superior extension into left temporal lobe.

She refused any further cancer treatment and expired four months later due to progression of the disease.

Discussion

Malignant tumours of the mastoid and middle ear are rare, accounting for 5% to 26% of all ear neoplasms.^{1,3} The incidence is 1 case in 1 million with peak age of 60 years^{1,3} and squamous cell carcinoma is the most common type.



Figure 1: CT scan of the temporal bone showing a soft tissue density in left external auditory canal and ear cavity

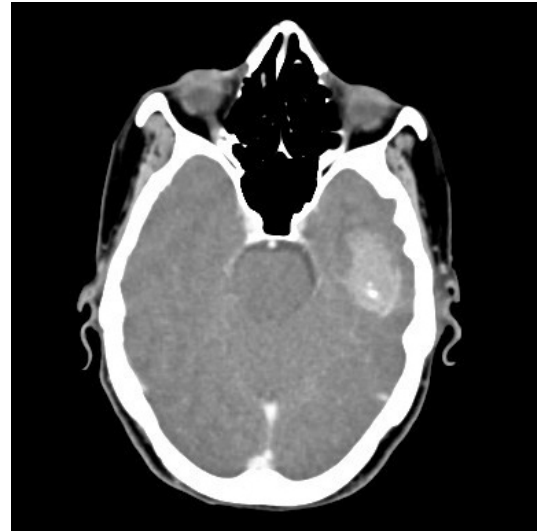


Figure 2: CT scan of the brain showing extension of the tumour into the left temporal lobe

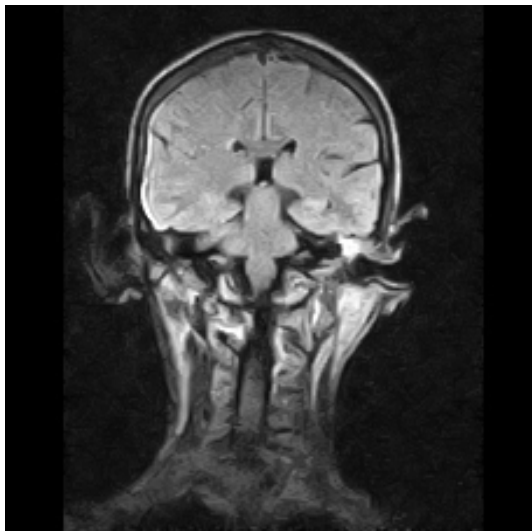


Figure 3: MRI brain FLAIR image showing hyperintense soft tissue lesion in the left middle ear cavity suggestive of residual disease.

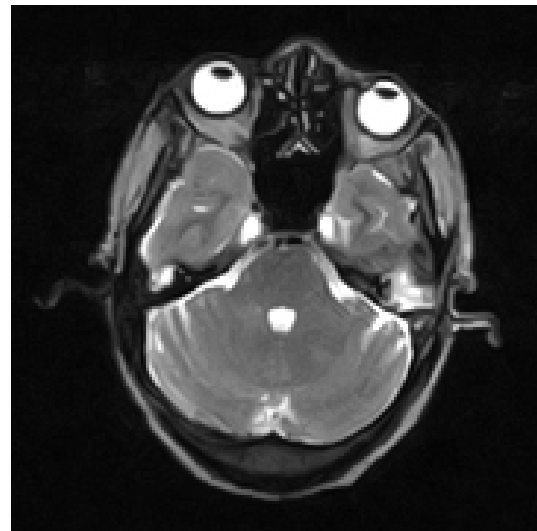


Figure 4: MRI brain post gadolinium enhanced T1 image showing soft tissue lesion extending into left temporal lobe through the roof of middle ear.

It was first recognised as a distinct entity by Politzer in 1883. Later reports of its association with chronic middle ear suppuration appeared. It presents a diagnostic and management challenge because of this association. Over the past three decades, the literature has not reported significant advances in the management of this disease. It is usually a unilateral disease. The major etiological factor is chronic suppurative otitis media.^{1,4} Irradiation and inverted papilloma of the middle ear have been reported to be additional risk factors.^{1,2,5}

Stell and McCormick's⁷ T-staging system

based on 33 tumours in the external canal and 44 in the middle ear is shown in Table 2:

Planned combined treatment of surgery followed by post-operative radiotherapy is the standard of care.⁷ Post-operative radiotherapy is preferred over pre-operative radiotherapy because of the poor vascularity of the tumour bed. A combination of surgery and radiotherapy as opposed to single modality treatment is likely to yield the best results. The goal of treatment is palliation in advanced cases. A larger tumour needs an en bloc resection of the temporal bone which should provide the safety margin required

Table-1: Goodwin and Jesse⁶ staging system of cancer of the ear

Stage I	A cancer involving the external ear without involving other structures of the temporal bone or cancer confined to the membranous canal.
Stage II	A cancer involving the external ear canal and the adjacent eardrum without actual middle ear extension.
Stage III	A cancer not only involving the site of origin but also extending into the middle ear cleft or base of the skull and petrous pyramid.

Table-2: Stell and McCormick⁷ T-staging system of cancer of the ear

Tx	Insufficient data for classification, including patients previously operated upon or treated elsewhere.
T1	Tumour limited to the site of origin, and AND no facial nerve paralysis and no bony destruction on radiologic evaluation.
T2	Tumour extends beyond the site of origin, indicated by facial nerve paralysis or radiologic evidence of bone destruction but with no extension beyond the organ of origin.
T3	Clinical or radiologic evidence of extension into surrounding structures (dura, base of skull, parotid gland or temporomandibular joint).
N	There is no recommendation as to nodal classification.

to ensure a cure. Once disease is apparent in the middle ear space, the cure rate is 20 - 30%. Post-operative radiotherapy improves local control, but there is no increase in the five year survival rate when tumours are only partially resected or incompletely resected.⁷ Post-operative radiotherapy is usually between the range of 55 - 65 Gray delivered over 5 to 6 weeks. Five-year survival is about 5%-50% in patients who undergo surgery and radiotherapy.⁸ Patients with petrous bone invasion, dura invasion and distant metastasis have poor outcome.

Squamous cell carcinoma of middle ear cavity being a rare entity, the treatment used is extrapolated from results of head and neck cancer. Hence multicenter randomized trials are needed to find out the optimal treatment regimen in this rare malignancy.

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Primary Gastrointestinal and Biliary Tract Cancer Manifesting as Ovarian Mass

Parekh Chetna D¹, Desai Ava D², Patel Shilpa M³, Patel Bijal M⁴

Junior Lecturer¹, Professor and Head of Unit², Professors³, Assistant Professor⁴
Department of Gynecological Oncology

Summary

We report two cases of a metastatic ovarian carcinoma which mimicked primary ovarian malignancies. Clinically, these patients presented with abdominal masses with obvious signs and symptoms related to ovarian carcinoma. Radiological investigations also suggested the possibility of a primary ovarian tumor. But they had primary malignancy in appendix and gallbladder. The exact diagnoses could only be made after histopathology and immunohistochemistry examination.

Introduction

Approximately 7 to 10% of all clinically apparent ovarian cancer arises from malignant tumors metastatic to the ovary.¹ Metastatic tumor can be confused with primary tumors of the ovary. The most common primary sites for metastatic ovarian disease are tumors of colon, rectum, breast, endometrium, contra lateral ovary and stomach, rarely from appendix, pancreas, cervix, fallopian tube, vulva, gall bladder, urinary tract as well as lymphoma and leukemia.² Because women with metastatic ovarian tumors require different therapy and have a shortened survival compare to women with primary ovarian tumors, the identification of a metastatic ovarian tumor is very important.¹ Two cases of adenocarcinoma, one from the appendix and another from gallbladder with metastasis to ovary, manifesting as a pelvic mass (primary ovarian tumor) is presented.

Case 1

A 50-year-old menopausal woman was referred to our institute on fifth June 2012 with complaints of pain and swelling in the abdomen for two to three months. Systemic examination revealed abdominal distension and large fixed, firm, hypogastric mass reaching up to the umbilicus. Routine biochemical tests and haematological parameters were normal. A computed tomography (CT) scan of her abdomen showed 17.5x14.2 x7.4 cm lesion, predominantly cystic arising from the pelvis with mild ascitis. It was compressing the right ureter

causing mild hydronephrosis and hydroureter. The mass was adherent to uterus. Upper abdominal CT findings were normal. Carcinoma antigen - 125 (CA-125) was 148.2 U/ml (normal range: up to 35 U/ml) and Carcinoembryonic antigen (CEA) was 46.98 ng/ml (normal range: up to 3 ng/ml). On surgical oncologist's advice colonoscopy and gastroscopy were done, however, there was no evidence of primary tumor in gastrointestinal tract.

On surgical exploration there was moderate amount of mucinous ascitic fluid and an enlarged right ovarian cyst of 23 x 19 x 5 cm in size (Figure 1). Uterus and left ovary were normal. The omentum appeared diseased and there were small deposits present over the under surface of diaphragm and intestines and peritoneum. Appendix appeared inflamed (Figure 2). Right ovarian mass with fallopian tube was removed and sent for frozen section and the report revealed mucinous cystadenocarcinoma. Total abdominal hysterectomy with left salpingo-oophorectomy, total omentectomy, appendectomy and bilateral pelvic lymph node dissection was done. Final histopathology report of the specimen revealed well differentiated primary mucinous adenocarcinoma of the appendix infiltrating the wall superficially. The muscularis propria was free of tumor. There was secondary metastatic adenocarcinoma of the right ovary. The uterus, opposite ovaries, omentum and pelvic lymph nodes were free of tumor. Fluid cytology was positive for malignant cell. Immunohistochemistry was performed on both appendix and ovarian tumor. It revealed CEA and CK20-positive and CA-125 and CK7 negative in both the specimen. Thus confirms the diagnosis of primary from appendix and stage-IV A according to AGCC classification. Patient was for palliative treatment.

Case 2

A 60-year-old menopausal woman presented with abdominal pain and discomfort with postmenopausal vaginal bleeding. Systemic examination revealed abdominal distension and a large pelvic mass which was mobile and hard. An ultrasound

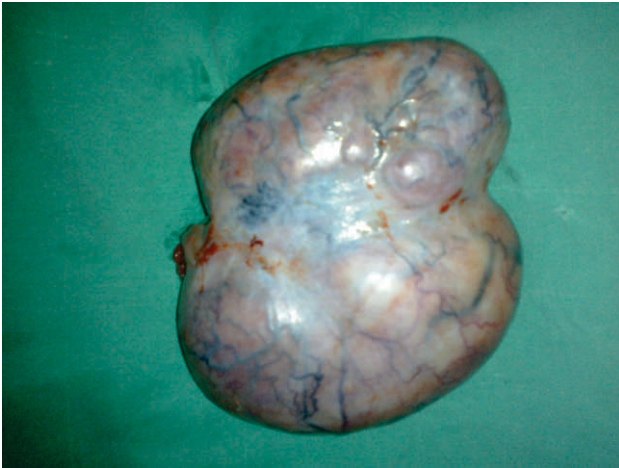


Figure: 1 Metastatic ovarian tumor

examination of her abdomen showed a diffusely thickened gallbladder with multiple calculi and large, multycystic adnexal masses of 12 x 7 x 11 cm anterior to uterus, suggestive of a primary ovarian malignancy with chronic cholecystitis and cholelithiasis. Her serum tumor marker CA-125 was raised (167.2 U/mL). Dilatation and curettage done for postmenopausal bleeding was unremarkable. On surgical exploration there was minimal ascitic fluid and an enlarged left ovarian cyst of 11 x 8 x 6 cm in size. Uterus and right ovary were normal. Left ovarian mass with tube removed and sent for frozen section. Frozen section report was malignant surface epithelium. The cut section revealed multilocular cyst with mucinous fluid. The patient underwent total abdominal hysterectomy, right salpingo-oophorectomy and bilateral pelvic lymph node dissection. On exploration the gallbladder, was found to be inflamed and omentum was adherent to it. Hence opinion of surgical oncologist was sought. Cholecystectomy with removal of part of adjacent liver was also performed with supra colic omentectomy and para caval and retro choledocal lymph node dissection.

Histopathological report revealed moderately differentiated primary adenocarcinoma of gallbladder, involving full thickness and reaching up to liver. Left ovary revealed metastatic mucinous adenocarcinoma. Right ovary, omentum and all para caval and retro choledocal lymph nodes were free of tumor. It also revealed an accidental finding of right tuberculous salpingitis. Thus the patient was diagnosed as carcinoma of gallbladder, stage-IV B (according to AGCC classification). Patient was referred for palliative treatment.

Discussion

Primary adenocarcinoma of the appendix is a rare malignancy that constitutes less than 0.5% of all gastrointestinal neoplasms.³ Malignancies of the appendix are never suspected preoperatively and

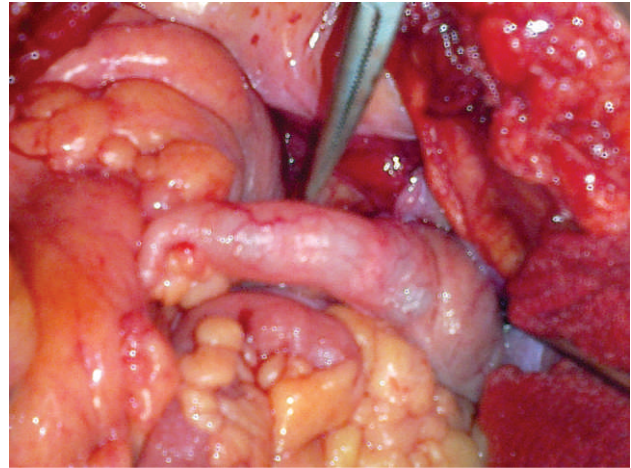


Figure: 2 Appendix in a case of metastatic ovarian tumor

seldom postoperatively, the diagnosis being usually made at histopathology of the specimen as in our case.⁵ The clinical presentation is usually non-specific. Patient may present with right lower abdominal pain mimicking appendicitis or can also be asymptomatic or can have symptoms due to large pelvic mass. Cases of primary adenocarcinoma of the appendix presenting as ovarian cystadenocarcinoma are rare. Preoperative diagnosis, although important for proper surgical management, is difficult due to the absence of specific clinical and imaging findings.

Our patient presented with unilateral large ovarian cystic mass with elevated CA-125 and CEA mimicking primary ovarian pathology. Appendectomy was done as frozen section report revealed mucinous neoplasm. Intra operatively appendix was inflamed and also it is our policy to remove appendix in all cases of mucinous ovarian tumor.⁴

It is important for the gynecologic oncologist to be aware of the clinico pathological features and surgical management of these malignancies, as the incidence, prognosis, and recommended treatment vary. Mucinous ovarian tumor, either bilateral or unilateral should be considered metastatic from the appendix, unless removal of the latter followed by step- sectioning of the entire organ for microscopic examination fails to reveal a mucinous tumor.^{4,5} A large ovarian mucinous neoplasm may actually represent a metastasis from a small appendiceal tumor. Approximately two third of appendiceal malignancies present as adnexal masses. If not virtually all, the majority of mucinous adenocarcinoma of the ovary is derived from appendix, even if appendix appears to be grossly normal.⁴

Right hemicolectomy appears to be a reasonable option, although its superiority to appendectomy alone has not been definitively proven.^{5,6} Patients, who underwent right hemic-

lectomy had a better prognosis for survival than appendectomy patients, but the difference was not statistically significant. Right hemicolectomy does not confer a survival advantage in patients with mucinous appendiceal tumours with peritoneal seeding.⁶ The treatment options for metastatic disease include systemic chemotherapy alone, intraperitoneal chemotherapy, cytoreductive surgery with peritonectomy, and combination of treatments. Of those treatment options, cytoreductive surgery and hyperthermic intraperitoneal chemotherapy have recently become the treatment of choice for metastatic disease.^{5,6} In our patient hemicolectomy was not done due to wide spread peritoneal disease.

Metastasis from gallbladder to ovary is rare. Although a figure of 6% cases of gallbladder carcinoma with metastasis to ovary has been quoted by Albores-Saavedra only few reports are available in the literature.⁷ Some of these were initially misdiagnosed as a primary ovarian tumor. Lack of awareness or limited information may be the reasons for incorrect diagnosis in these cases. Therefore the unique features of occult gallbladder cancer going to ovary need to be explored and reported.⁸

As in our patient, most of these patients usually have non-specific abdominal or pelvic symptoms (pain, distension, or mass). Jaundice or other symptoms related to gallbladder carcinoma may be absent. Radiological features of malignancy were masked by chronic cholecystitis or cholelithiasis. Serological markers such as alkaline phosphatase, and CA-125 were found to be variable at the time of metastases.⁷ In our case, the primary lesion in gallbladder and ovarian metastasis were detected simultaneously. Ovarian metastases from pancreatobiliary and gallbladder carcinomas can have histological resemblance with a primary ovarian epithelial tumor and differentiating metastasis from primary ovarian neoplasms is important in situations where the primary tumor is very small, without producing significant symptoms, and hence can escape detection. Outcome in these cases is generally poor.^{7,8} However, adequate surgery with palliative treatment may prolong survival for few months. Therefore at the time of surgical exploration presence of unusual findings such as a gallbladder mass, dense adhesions of the omentum and adjacent organs to the gallbladder, difficult dissection of the gallbladder from its liver bed should raise the suspicion of a carcinoma. A close evaluation of the extent of the disease should be carried out. External radiation therapy with or without chemotherapy may provide some palliative benefit to these patients.^{8,9}

The ovary is a common site of metastatic deposits. Among them Krukenberg tumors are well known. They are bilateral in more than 80% of

instances. But all metastatic tumors are not Krukenberg, thus metastatic ovarian pathology should also be kept in mind even in case of unilateral, cystic ovarian tumor. In the literature a variety of features have been emphasized that may help to differentiate metastasis from a primary ovarian tumor.¹⁰ Amongst these, the bilaterality, surface implants, multinodularity, infiltrative pattern, foci of uninvolved ovarian tissue, growth in the ovarian hilum, mucin without epithelial cells on the tumor surface and presence of signet ring cells are the most important clues for a metastatic adenocarcinoma. However, many of these features may be absent.^{8,9} Although the immunohistochemistry can distinguish metastasis from other organs with respect of colorectal carcinoma (CK7/CK20⁺) in contrast to ovarian primaries (CK7⁺/CA-125), its role in metastasis from gallbladder is limited because of similar profile to that of primary ovarian mucinous tumors.^{8,10} A thorough gross examination and adequate sectioning therefore are important in such cases. Because metastatic ovarian tumors require different therapy, then the primary, the identification of a metastatic ovarian tumor is very important.

Mucinous carcinomas of ovary are uncommon histological types. These tumors of the ovary are distinct from other ovarian carcinoma types, as they can pose a particular challenge for correct diagnosis of the primary tumor from which they have metastasised.^{7,8}

Due to the overlapping features between primary and metastatic ovarian tumors and the higher frequency of the latter, the possibility of metastases should always be borne in mind in the evaluation of carcinomas of the ovary especially mucinous.⁹ A previous history of colorectal, breast, pancreas or gastric cancer should be prompt at thorough preoperative evaluation to rule out metastasis from these sites. Physical examination findings rarely accurately identify the primary site because metastases to the ovary tend to be larger than the primary tumor.

Tumor markers are sometime helpful in characterizing ovarian tumor. As CA-125 and CK 7 is most likely suggestive of primary ovarian tumor and CK20 and CEA is for primary gastrointestinal tumor.¹⁰ Rectal examination, stool test, gastroscopy and colonoscopy should be performed in cases of mucinous ovarian malignancies.^{1,2}

While computed tomography and pelvic ultrasound are insensitive at detecting gastrointestinal and billiary primary cancer, findings from these studies may hint at an extra ovarian primary site.^{1,2}

Frozen section pathologic examination is accurate in identifying the primary ovarian tumor, but it is not helpful in diagnosing metastatic ovarian

neoplasm.^{1,4}

As liver metastases are infrequently seen in primary ovarian malignancies, gastrointestinal carcinomas should be included in the differential diagnosis when liver metastases are present.^{1,2}

Conclusion

As gastrointestinal tumors may present as advanced ovarian cancer, increased vigilance is required in order to make the right diagnosis and offer the best treatment. Gallbladder carcinoma should be added to the previously known list of origins of metastatic tumors to the ovary that can closely mimic primary ovarian mucinous tumors.⁶ Pathologists and Gynecologist should maintain a high index of suspicion of metastatic disease to the ovary in evaluating bilateral as well as unilateral, solid or cystic ovarian tumors.⁷

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"When religion was strong and science weak, men mistook magic for medicine; now, when science is strong and religion weak, men mistake medicine for magic."

- Unknown

Anesthetic Management for Tracheal Tumor Resection and Reconstruction - A Case Report

Sanghavi Priti R¹, Shah Bijal M², Joshi Geeta M¹, Sharma Gaurav³, Taneja Pravesh³, Patel Bipin M⁴

Professor¹, Assistant Professor², Resident³, Professor & HOD⁴
Department of Anesthesiology

Summary

Tracheal resection and reconstruction is a challenging situation for anesthesiologist as it is a lengthy procedure with unavoidable episodes of ventilatory insufficiency, leading to inadequate gaseous exchange. Adequate visualization of immobile endo-tracheal lumen is essential for surgeon, which requires utmost communication between surgeon and anesthesiologist. We report a successful anesthetic management of a patient with lower tracheal tumor, 1.5 cm above the carina. Tracheal resection and reconstruction was done using right thoracotomy approach with right lung collapse and left lung ventilation.

Introduction

First tracheal resection was performed in 1950s, for benign stricture of trachea.¹ Primary tracheal tumor is the second most frequent cause of tracheal resection and reconstruction. Maximum length to be resected was believed to be 2 cm but advance in surgical and anesthesia techniques now permit more than half of the trachea to be excised safely.^{2,3}

Case Report

A 40 years old male patient weighing 55 kg presented with progressively increasing dyspnea for one and half month, cough with expectoration, decrease in appetite and weight loss. After investigations he was diagnosed to have adenocystic carcinoma grade 1 arising from lower trachea (Figure 1) and so he was posted for surgical resection and reconstruction. A right thoracotomy surgical approach was planned.

On preoperative examination patient was comfortable at rest except for breathlessness. On auscultation of lungs bilateral air entry was equal with no foreign sound. His vital signs, all other systems and routine investigations including x-ray chest and baseline ABG were within normal limits. CT scan of thorax revealed a 2.9 cms x 2.6 cms x 2.5 cms sized heterogeneously enhancing soft tissue lesion arising from right posterolateral wall of trachea, 1.5 cm above the carina (Figure 2). Fiberoptic Bronchoscopy confirmed the location of mass, as well as information regarding intubation. Risk of anesthesia,

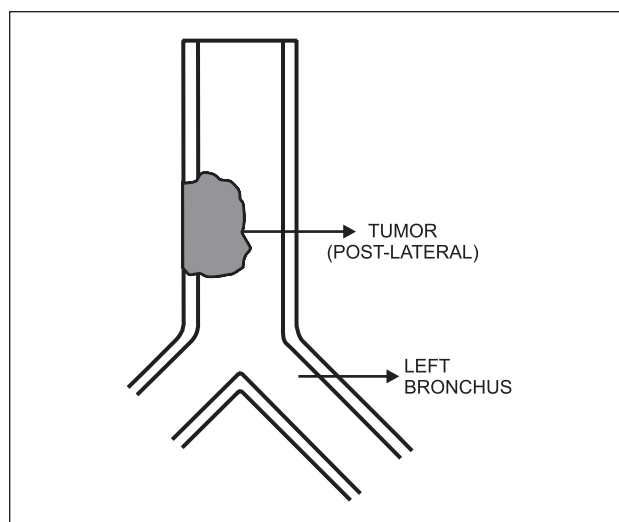


Figure 1: Tumor in trachea

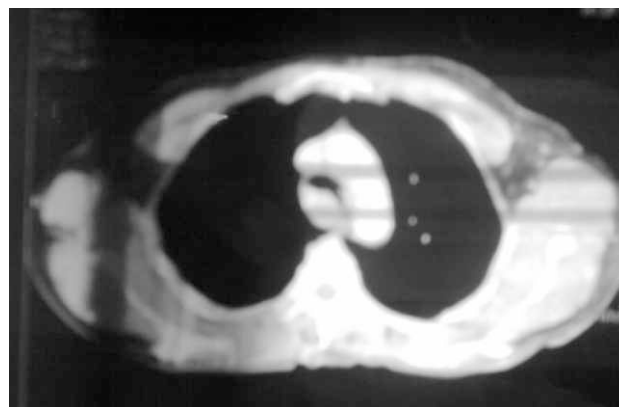


Figure 2: CT scan thorax showing tumor obstructing tracheal lumen

surgical procedure, intraoperative and postoperative complications and need of postoperative ventilation were explained to patient and relatives. No premedication was given. Written informed consent was obtained. Patient was wheeled into the operation room and after applying ECG, NIBP and SPO₂, a 20G thoracic epidural catheter was inserted at T₇-T₈ space under aseptic precautions. Patient was preoxygenated for 5 min, fiberoptic intubation was carried out under topical anesthesia and sedation. Sedation was provided with inj Fentanyl 1 mcg/kg and injection (inj) Propofol 1mg/kg. An oral single lumen portex

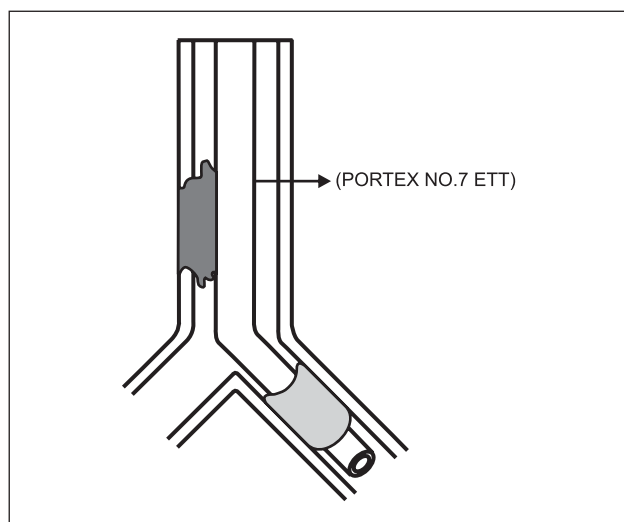


Figure 3: Portex ETT in left main bronchus

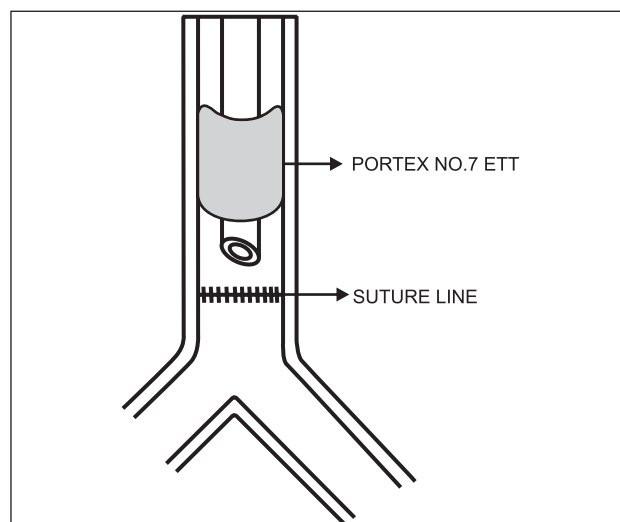


Figure 5: Portex ETT above suture line

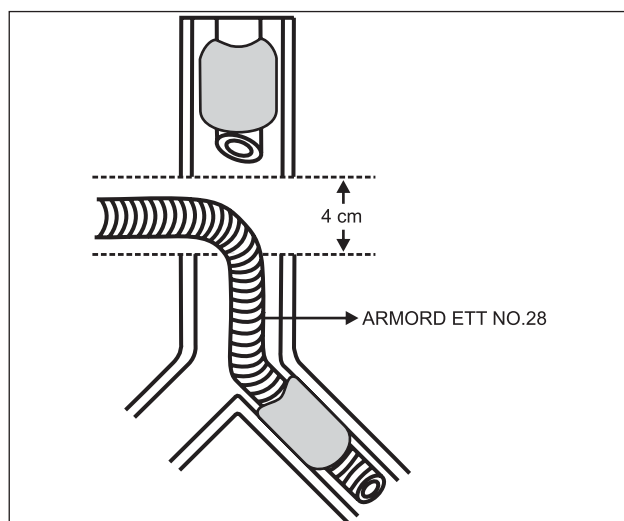


Figure 4: Armored ETT in left main bronchus

endotracheal tube No 7 was advanced into left bronchus (Figure 3). After confirmation of ventilation; inj Propofol 1.5 mg/kg, inj Fentanyl 1mcg/kg and long acting muscle relaxant inj Vecuronium bromide were given. Anesthesia was maintained with gas, oxygen and sevoflurane. Epidural injection of Bupivaccaine hydrochloride 0.125% 10 ml was given before giving thoracotomy position.

During dissection of trachea one lung ventilation was maintained with oral ETT, but when trachea was opened, oral tube was withdrawn above the mass, lower end of trachea below the lesion was cut and surgeon inserted another 28 no flexometallic tube in left main bronchus (Figure 4). Distal ventilation was continued using another sterile circuit attached to the ventilator. After resection and anastomosis of posterior trachea; distal tube was withdrawn and proximal tube was advance in left bronchus. In the last stage of anastomosis, oral tube was kept above suture line (Figure 5) and remaining

anastomosis was completed. Both lungs were ventilated with lower tidal volume, high respiratory rate and low peak end expiratory pressure. Air leak was checked. A guardian stitch was placed between chin and anterior chest wall to achieve head flexion. Surgery lasted for 4 hrs and 4 cms of trachea was resected. ECG, NIBP, SPO₂ ETCO₂, Fluid input and urine output were monitored throughout the operation. Patient was kept on ventilator with low tidal volume, high RR and low peak pressure. Inj Dexmedetomidine was started as ICU sedation under close monitoring of pulse and blood pressure for 24 hrs. Next day patient was weaned off from ventilator but was kept intubated. Next day sedation was provided with Inj Fentanyl and Inj Midazolam. On 3rd postoperative day, after fiber optic bronchoscopy and suctioning patient was extubated successfully. Postoperative analgesia was provided with epidural injection of inj bupivaccaine hydrochloride. Physiotherapy was started from the next day of surgery. The guardian stitch was kept for 5 days.

Discussion:

Tracheal resection and reconstruction surgery has been divided into five phases: induction, dissection, open trachea, closure and emergence.² He has suggested induction, open trachea and emergence are the critical and potentially dangerous stages. So, close communication between surgeon and anesthesiologist is required during these stages.

Grillo HC³ had suggested rigid bronchoscopy as the gold standard, as it provides true vision of tracheobronchial tree. Preoperative Pulmonary function test (flow- volume Loops), identification of whether the obstruction is fixed or variable and differentiation of intra from extra thoracic obstruction is essential. In our case obstruction was fixed and intrathoracic and segmental resection with primary anastomosis was planned through right anterolateral thoracotomy.

In our case Anesthesiologist and Endoscopist team decided to perform fiber optic intubation under topical anesthesia and sedation because preoperative bronchoscopy revealed that ETT No 7.5 could be passed easily. According to Kamaly AM¹ inhalation induction is the safest and most recommended technique. Mentzelopoulos SD et al⁴ had performed an inhalation induction of anesthesia with 8% sevoflurane in a tidal breathing technique. IV induction may be used with proper airway judgement but spontaneous breathing must be maintained till airway is secured. Muscle relaxant was not given for intubation to preserve gas exchange as long as possible and according to Young-Beyer P and Wilson RS⁵, muscle relaxant should be avoided in patient with compromised airway until their airway is secured.

Hannallah MS⁶ suggested that in patient with very low tracheal or carinal lesions where the endotracheal tube must be proximal to anastomosis; a low tidal volume with increased respiratory rate and low level of positive end expiratory pressure can be used postoperatively. In their case trachea was intubated while the neck was maintained in a flexed position for 5 days, same as in our case. The tube position required frequent adjustment under fiber optic bronchoscopy.

The length of trachea that can be resected safely in individual varies widely with age, posture, bodily habitus, extent of disease and prior tracheal surgery. About one half of adult trachea is safely resectable in most cases, while more fragile juvenile is at risk if resection exceeds more than one third'. In our case 4 cm of trachea was resected.

Rane DK et al⁷ has suggested various methods for providing adequate oxygenation and carbon dioxide elimination during tracheal resection. This includes standard orotracheal intubation, insertion of tube into open trachea distal to the area of resection, HFJV through stenotic area, HFPPV and cardiopulmonary bypass.

Conclusion:

Anesthesia for tracheal resection is one of the most challenging aspects of anesthesia practice

because of unique condition associated with narrowed airway diameter and problems of maintaining ventilation during bronchoscopy, induction and the period of the surgical repair. Careful preoperative evaluation of the site and degree of obstruction, close intraoperative communication between the surgeon and anesthesiologist, improved anesthetic techniques and meticulous postoperative care contribute to the successful outcome.

Acknowledgments: We Acknowledge Dr Shah Shakuntala V, Professor and Head, and Dr Patel Mahesh D, Assistant Professor, Surgical Oncology, for their help in perioperative management of this patient.

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"We have not lost faith, but we have transferred it from God to the medical profession."

- George Bernard Shaw

Summaries of the Published Reports

Department of Community Oncology and Medical Records

(A) Population Based Cancer Registry - Gandhinagar district

Year: 2010

Directorate of Medical Education and Research, Gandhinagar, has sanctioned the continuation of "Population Based Cancer Registry – Gandhinagar district" project for the year 2010 with the main objective of generating reliable data on magnitude and pattern of cancer morbidity and mortality among the residents of Gandhinagar district.

During year 2010, 835 (Males: 492; Females: 343) patients with cancer were recorded. The Crude Cancer Incidence Rate (CIR) per lac population per year in male was 57.6 and in females 44.2. The corresponding Age Adjusted Rates (AAR) was 76.7 and 48.5. The truncated incidence rate (TR) among males and females were 146.9 and 106.3 per 1,00,000 persons respectively. Male/Female ratio was 1.43:1.

Majority of cases (14.23%) among males were found in age group of 50-54 and 55-59 years and 14.29% cases among females were found in age group of 45-49 years. About 90% of cancers occurred after age of 35 years, whereas total population above age of 35 years accounted for about 30% in both sexes thus indicating need for control measures to prevent cancer problem among general population at very beginning of truncated age group.

Paediatric cancers (age 0-14 years) constituted 19 cases (2.28%) of total cancer load in both sexes with higher percentage of cases among boys (2.44%) than girls (2.04%).

Tongue cancer (13.21%) was the leading site among males followed by cancer of Mouth (13.01%), Lung (8.13%), Oesophagus (6.71%) and Hypopharynx (4.47%). Among females, Breast (23.03%) was the leading site followed by cancer of Cervix (13.12%), Ovary (6.12%), Mouth (4.95%) and Tongue (4.08%).

Over half (55.89%) of all cancers in males and 19.24% of all cancers in females were Tobacco Related Cancers.

During the year 2010, Head & Neck cancers constituted 30.90% of total cancers. Among males, 204 cases (41.46%) and among females, 54 cases (15.74%) were head and neck cancers.

In the year 2010, 134 deaths in males and 94 deaths in female were registered. The Crude Mortality Incidence Rate (CMR) per lac population per year in

male was 15.7 and in females 12.1. The corresponding Age Adjusted Mortality Rates (AAMR) was 21.3 and 13.4. The Truncated Mortality Incidence rate (TMR) among males and females were 37.3 and 24.9 per 1,00,000 persons respectively. Mortality to Incidence (M/I) ratio was 27.31% and the cases registered with Death Certificate Only sources (DCOs) accounted for 0.84% in both the sexes.

Year: 2011

Directorate of Medical Education and Research, Gandhinagar, has sanctioned the continuation of "Population Based Cancer Registry – Gandhinagar district" project for the year 2011 with the main objective of generating reliable data on magnitude and pattern of cancer morbidity and mortality among the residents of Gandhinagar district.

During year 2011, 767 (Males: 458; Females: 309) patients with cancer were recorded. The Crude Cancer Incidence Rate (CIR) per lac population per year in male was 52.47 and in females 39.02. The corresponding Age Adjusted Rates (AAR) was 68.53 and 42.1. The truncated incidence rate (TR) among males and females were 131.32 and 99.4 per 1,00,000 persons respectively. Male/Female ratio was 1.48:1.

Majority of cases (13.10%) among males were found in age group of 55-59 years and 15.53% cases among females were found in age group of 45-49 years. About 85% of cancers occurred after age of 35 years, whereas total population above age of 35 years accounted for about 30% in both sexes thus indicating need for control measures to prevent cancer problem among general population at very beginning of truncated age group.

Paediatric cancers (age 0-14 years) constituted 16 cases (2.09%) of total cancer load in both sexes with higher percentage of cases among boys (2.62%) than girls (1.29%).

Mouth cancer (16.38%) was the leading site among males followed by cancer of Tongue (13.32%), Lung (8.52%), Oesophagus (5.68%) and Hypopharynx and Larynx (4.15%). Among females, Breast (25.89%) was the leading site followed by cancer of Cervix (17.48%), Mouth (5.83%), Tongue and Ovary (5.18%) and Myeloid Leukemia (3.88%).

Over half (59.17%) of all cancers in males and 19.42% of all cancers in females were Tobacco Related Cancers.

During the year 2011, Head & Neck cancers

constituted 34.29% of total cancers. Among males, 213 cases (46.51%) and among females, 50 cases (16.18%) were head and neck cancers.

In the year 2011, 226 deaths in males and 125 deaths in female were registered. The Crude Mortality Incidence Rate (CMR) per lac population per year in male was 25.9 and in females 15.8. The corresponding Age Adjusted Mortality Rates (AAMR) was 34.62 and 17.2. The Truncated Mortality Incidence rate (TMR) among males and females were 65.38 and 37.8 per 1,00,000 persons respectively. Mortality to Incidence (M/I) ratio was 45.76% in both the sexes.

Cancer Incidence and Mortality – Patan district

Year: 2011

Directorate of Medical Education and Research, Gandhinagar, has sanctioned the project “Cancer Incidence and Mortality – Patan district “for the year 2011 with the main objective of generating reliable data on magnitude and pattern of cancer morbidity and mortality among the residents of Patan district.

During year 2011, 472 (Males: 310; Females: 162) patients with cancer were recorded. The Crude Cancer Incidence Rate (CIR) per lac population per year in male was 43.90 and in females 24.92. The corresponding Age Adjusted Rates (AAR) was 61.84 and 28.63. The truncated incidence rate (TR) among males and females were 128.17 and 63.77 per 1,00,000 persons respectively. Male/Female ratio was 1.91:1.

Majority of cases (16.13%) among males were found in age group of 60-64 years and 14.81% cases among females were found in age group of 55-59 years. About 90% of cancers occurred after age of 35

years, whereas total population above age of 35 years accounted for about 27% in both sexes thus indicating need for control measures to prevent cancer problem among general population at very beginning of truncated age group.

Pediatric cancers (age 0-14 years) constituted 13 cases (2.75%) of total cancer load in both sexes with higher percentage of cases among boys (2.90%) than girls (2.47%).

Tongue cancer (14.19%) was the leading site among males followed by cancer of Lung (11.29%), Mouth (10.97%), Hypopharynx (7.42%) and Larynx and Brain & Nervous System (4.84%). Among females, Breast (24.69%) was the leading site followed by cancer of Cervix (13.58%), Ovary and Tongue (4.94%), Mouth (4.32%) and Myeloid Leukemia (3.70%).

61.29% of all cancers in males and 15.12% of all cancers in females were Tobacco Related Cancers.

During the year 2011, Head & Neck cancers constituted 36.23% of total cancers. Among males, 147 cases (47.42%) and among females, 24 cases (14.81%) were head and neck cancers.

In the year 2011, 74 deaths in males and 38 deaths in female were registered. The Crude Mortality Incidence Rate (CMR) per lac population per year in male was 10.48 and in females 5.85. The corresponding Age Adjusted Mortality Rates (AAMR) was 15.19 and 6.75. The Truncated Mortality Incidence rate (TMR) among males and females were 28.60 and 13.04 per 1,00,000 persons respectively. Mortality to Incidence (M/I) ratio was 23.73% and the cases registered with Death Certificate Only sources (DCOs) accounted for 2.75% in both the sexes.

"The art of medicine consists in amusing the patient while nature cures the disease."

-Voltaire

Summaries of Published Articles

01. Editorial: What is the Hitch for Optimum Cancer Pain Management in India

Joshi Geeta M

Department of Anesthesiology

Summary

The editorial addresses the issues of Cancer Pain, its prevalence and factors responsible for under treatment of this complex pain syndrome. In fact 70 to 90% of all cancer pain can be controlled with oral analgesic drugs prescribed as per WHO analgesic ladder. 10% of cancer patients need interventional pain management. Many myths, on part of patients, caregivers & treating physicians play a major role in treating cancer pain. Availability of opioids, its misuse, fear of addiction and lack of training & education results in under prescription of opioids, which is very effective and affordable treatment for cancer pain. Paucity of funds for Pain and Palliative Care is prime concern in addressing unresolved issues of cancer pain management in India.

Indian Journal of Pain: 2011; 25: 4-5

02. Palliative Care Scenario – Gujarat

Joshi Geeta M

Department of Anesthesiology

Summary

Palliative Care concept was initiated in Gujarat in 1988 with the opening of a pain clinic and palliative care service under the department of Anesthesiology at Gujarat Cancer & Research Institute (GC&RI) a Regional Cancer Centre in Western India. The Indian Association of Palliative Care was registered as

Public Trust & Society in March 1994 in Ahmedabad, which was a platform to address all issues of Palliative Care. In last 20 years, about 10 cancer centers have come up across Gujarat. Each centre has at least one trained doctor or staff nurse in palliative care. Morphine is available at five centers. There are couples of manufacturers involved in Morphine production in Gujarat, but the narcotic Law is yet not simplified. Pain & Palliative Care services at G C & R I has established network with all these centers for patient reference and for training in Palliative care.

Available at:

indiapalliativecare.blogspot.in/2012/04

03. Perioperative Management of a Patient with Glucose-6-Phosphate Dehydrogenase Deficiency

Patel Ravi, Bhade Madhuri A, Sanghavi Priti, Patel Bipin M

Department of Anesthesiology

Summary

Glucose-6-Phosphate dehydrogenase deficiency is an X-linked recessive enzymatic disorder of HMP Shunt pathway of carbohydrate metabolism responsible for acute hemolysis following exposure to oxidative stress. The anaesthetic management in such patient posted for composite resection is discussed focusing on avoiding the drugs implicated in hemolysis, reducing surgical stress with adequate analgesia and monitoring for and treating the hemolysis should it occur.

I.M.A.G.S.B. News Bulletin: 2012; 7: 99-100

"A vigorous five-mile walk will do more good for an unhappy but otherwise healthy adult than all the medicine and psychology in the world."

— Paul Dudley White

Summaries of Presentations at Clinical Meetings

01. Protocols for Infection Prevention and OT Discipline - Guidelines from Centre of Disease Control & Prevention

Shah Mandip

Department of Musculo Skeletal Oncology

Summary

The recommendations have been divided in three categories:

Category IA: Strongly recommended for implementation and strongly supported by well designed experimental, clinical or epidemiological studies. Identify and treat all infections remote to the surgical site until resolved prior to surgery. Do not remove hair preoperatively unless the hair at or around the incision site will interfere with the operation. If hair is removed, remove immediately before the operation, preferably with electric clippers. Administer a prophylactic antimicrobial agent only when indicated, and select it based on its efficacy against the most common pathogens causing SSI for a specific operation and published recommendations.

Administer by intravenous route the initial dose of prophylactic antimicrobial agent, timed such that a bactericidal concentration of the drug is established in serum and tissues when the incision is made. Maintain therapeutic levels of the agent in serum and tissues throughout the operation and until, at most, a few hours after the incision is closed in the OR. Before elective colorectal operations in addition to above, mechanically prepare the colon by use of enemas and cathartic agents. Administer non-absorbable antimicrobial agents in divided doses on the day before the operation.

For high-risk cesarean section administer the prophylactic antimicrobial agent immediately after the umbilical cord is clamped. Adhere to principles of asepsis when placing intravascular devices, spinal or epidural anesthesia catheters, or when dispensing and administering intravenous drugs.

Category IB: Strongly recommended for implementation and supported by some experimental, clinical or epidemiological studies and by a strong theoretical rationale. Adequately control serum blood glucose levels in all diabetic patients and particularly avoid hyperglycemia perioperatively. Encourage tobacco cessation. Do not withhold necessary blood products. Require patients to shower or bathe with an antiseptic agent on at least the night before the operative day. Thoroughly wash and clean at and around the incision site to remove gross contamination before performing

antiseptic skin preparation. Use an appropriate antiseptic agent for skin preparation. Surgical team members should keep nails short and not wear artificial nails. Perform a preoperative surgical scrub for at least 2 to 5 minutes using an appropriate antiseptic, scrubbing the hands and forearms up to the elbows. After performing the surgical scrub, keep the hands up and away from the body so that the water runs from the tips of the fingers toward the elbows. Dry hands with a sterile towel and don a sterile gown and gloves. Surgical personnel who have signs and symptoms of a transmissible infectious illness should report conditions promptly to their supervisory and occupational health service personnel.

Develop well-defined policies concerning patient care responsibilities when personnel have potentially transmissible infectious conditions. Obtain appropriate cultures from and exclude from duty those surgical personnel who have draining skin lesions until infection has been ruled out or personnel have received adequate therapy and infection has resolved. Do not routinely exclude surgical personnel who are colonized with organisms such as *Staphylococcus aureus* or group A *Streptococcus* unless such personnel have been linked epidemiologically to dissemination of the organism in the healthcare setting. Maintain adequate positive-pressure ventilation in the OR with respect to the corridors and adjacent areas. Maintain a minimum of 15 air changes per hour, of which at least three should be fresh air. Filter all air, recirculated and fresh, through the appropriate filters per the American Institute of Architects' recommendations. Introduce all air at the ceiling and exhaust near the floor. Keep all OR doors closed except as needed for passage of equipment, personnel and patient. Use EPA-approved hospital disinfectants to clean areas visibly soiled with blood or body fluids between cases. Sterilize all surgical instruments according to published guidelines. Perform flash sterilization only for patient care items that need to be used immediately, not for convenience or as an alternative to purchase additional instrument sets or to save time. Wear a surgical mask that fully covers the mouth and nose when entering the operating room if the operation is about to begin or underway or if sterile instruments are exposed and throughout the operation. Wear sterile gloves if you are a scrubbed surgical team member. Use surgical gowns and drapes that are effective barriers when wet.

Use a sterile dressing for 24 to 48 hours postoperatively to protect an incision that has been

closed primarily. Wash hands before and after dressing changes and any contact with the surgical site.

Category II: Suggested for implementation and supported by suggestive clinical or epidemiological studies or by a theoretical rationale. Prepare surgical site from center to the periphery in a concentric circle fashion. Keep preoperative hospital stay as short as possible. Clean underneath each finger nail before first surgery of the day. Do not wear hand or arm jewelry. Perform orthopedic implant surgeries under laminar airflow. Limit the number of personal scrubs on a case. Wet vacuum the operation room floor after the last surgery of the day. Assemble sterile equipments and solutions immediately prior to the procedure. When an incision dressing is being changed, use a sterile technique.

02. Prosthetic Rehabilitation at GCRI

Soni Jyotika

Prosthesis and Rehabilitation Centre

Summary

The department prepares artificial limbs and organs. Part of face and other prosthesis as mentioned below are made from silicone and acrylic material. External prosthesis prepared is: ear, eye, nose, lip, cheek, chin, thumb, finger and breast. The department is involved in making artificial body parts for the patients attending cancer institute, not only cancer patients but patients handicap by birth, burns patients of accidental injury and having lost body parts are also benefited.

03. Experience about GIST at GCRI: A Review of 52 cases

Gaubha Yogesh

Department of Surgical Oncology

Summary

Gastrointestinal Stromal Tumors (GIST), account for less than 2% of all GI malignancies, but they are increasingly being diagnosed with help of IHC techniques. Introduction of Imatinib was a turning point in the management of GIST. The presentation is a retrospective study of 52 cases of GIST (cases enrolled in GCRI in 2009 & 2010). It will be an account about age and gender distribution, common presenting complaints, proportion of cases operable and metastatic, surgeries for GIST, use of targeted therapy (in adjuvant and palliative setting), treatment related side effects and disease response to targeted therapy.

04. Interventional Radiology in Cancer

Jolapara Milan

Department of Radiodiagnosis

Summary

Interventional radiologist has become an integral part of cancer management team. Procedures performed by an interventional radiologist are becoming increasingly important in the diagnosis and treatment of cancer or cancer-related complications. Diagnostic procedures include imaging-guided biopsies and fluid collections using USG or CT guidance. Therapeutic procedures include percutaneous thermal ablation (RF ablation, Cryoablation, Microwave ablation) of small tumors. Transcatheter chemoembolization is a procedure of choice in patients having unresectable HCC and in some liver metastasis. Portal vein embolization can be performed in patients planned for liver resection, but the volume of future remnant liver appears to be insufficient. Cancer complications can also be treated with interventional radiology techniques. Examples include pain control procedures, vertebroplasty and drainage of obstructed organs (PTBD, biliary stenting, PCN). Interventional radiology techniques typically represent the least invasive definitive diagnostic or therapeutic options available for patients with cancer. They can often be performed with less associated morbidity than other interventions. This presentation is an overview of all therapeutic and supportive/ adjuvant treatments offered by interventional radiologist to cancer patients.

05. Comparison of Saline Flush Test (SFT) and Internal Jugular Vein Occlusion Test (OT) for Detection of Misplaced Subclavian Vein Catheter into Ipsilateral Internal Jugular Vein

Patil Priyanka

Department of Anesthesiology

Summary

Misplacement of subclavian vein (SV) catheter into the ipsilateral internal jugular vein (IJV) is very common. Chest radiograph is the most reliable method to detect misplacement of central venous catheter, but it requires time, manpower and has disadvantage of radiation exposure which has to be repeated after any repositioning. 150 cancer patients for chemotherapy induction were planned for SV catheterization. In group F (75 patients) SFT was performed by injecting 10 ml of normal saline into the distal port of catheter while anterior angle of ipsilateral neck was palpated by an independent observer. A thrill of fluid elicited on the palm of hand (positive test) was suggestive of catheter misplacement into ipsilateral internal jugular vein. In group O (75 patients) IJV OT was performed by occluding IJV with external pressure over neck in the supraclavicular area for approximately 10 seconds and increase in CVP value above baseline value suggest misplacement into ipsilateral IJV. SV catheterization

was performed in 150 patients. In group F there were 8 misplacements as detected by chest radiography. In 5 patients catheter tip was located in ipsilateral IJV, in 2 patients it was in the contra lateral SV and in 1 patient it was in brachiocephalic vein. SFT was positive in all 5 patients who had misplaced SV catheter into ipsilateral IJV and negative in rest of the patients. In group O there were 10 misplacements as detected by chest radiography. In 7 patients catheter tip was located in the ipsilateral IJV and in 3 patients it was in contra lateral SV. IJV OT was positive in 6 patients with misplaced catheter into ipsilateral IJV with an increase of 3-6 mm of hg in CVP and negative in rest of the patients. Both SFT and IJV OT successfully detect the misplacement of the SV catheter into ipsilateral IJV with 100% sensitivity and specificity of SFT test and 85.6% sensitivity and specificity of IJV OT.

06. Hematopoietic Stem Cell Transplantation – A GCRI Experience Study of 158 Patients

Patel Kinnari

Department of Medical Oncology

Summary

Study of hematopoietic stem cell transplantation. We studied 158 cases of hematopoietic stem cell transplantation done in our institute from 1999 to 2011. Allogenic transplantation was done in 39% and autologous transplant in 61% of patients. Out of 158 patients Leukemia patients were 27, lymphoma pts. 48, Multiple myeloma 43, Thallesemia major 25, Aplastic anemia pts.7 and others were 8. Autologous transplantation was done in 97 patients. Most common indication was multiple myeloma (44%) while HL (28%), NHL (22%) and others were (6%). Allogenic transplantation was done in 61 patients, common diseases were Thallesemia major (41%), AML (36%), Aplastic anemia (11%), CML (8%). In Multiple Myeloma 53% are in CR, 32% Relapsed, 5% TRM and 9% expired after discharge. In Hodgkins Lymphoma 70% are in CR, 23% relapsed and 5% while in NHL 38% are in CR, 38% relapsed and 24% TRM. In Thallesemia 48% are in CR, 40% relapsed and 12% TRM. In AML 32% are in CR, 45% relapsed and 23% TRM. In Aplastic Anemia 71% are in CR and 29% relapsed or not responded but no TRM. Unlike regenerative stem cell therapy, HSCT is a curative and established mode of therapy for number of Hematological benign and malignant condition. HSCT should be done at earliest if indicated to get best results. HLA matched sibling or unrelated donor is must for Allogenic HSCT. HSCT does not have 100 % success rate or '100% Guarantee'. It has transplant related morbidity and mortality. Unlike solid organ transplant, life time Immunosuppression and same blood group donor is not required.

07. An Audit of Surgical Outcomes of Carcinoma of Esophagus in the unit (Surgical Oncology Unit – II)

Deshpande Gururaj

Department of Surgical Oncology

Summary

Esophageal cancer accounts for 5% of gastrointestinal malignancy with an insidious onset and a poor prognosis. Predominantly affects older age groups - 60 and 70 years of age. Male: female ratio of 3:2. The most common esophageal cancer worldwide is squamous cell carcinoma (SCC). Adenocarcinoma accounts for less than 15% of all esophageal cancers but incidence is increasing. In India it amounts for 0.06% of cancer deaths and about 11.20% of tobacco related cancers with peak age of incidence of 55-64yrs. The reported five year survival worldwide ranges from 5% to 30%. We have operated 26 cases of carcinoma esophagus between Feb2010 to Feb 2012. Male: Female was 3:2, SCC Vs. adeno ca. ratio was 3:1; Mean age of presentation was 48 yrs (30yr – 61yrs). Carcinoma middle/3: lower/3 was 2: 3. Dysphagia was most common symptom followed by weight loss. Squamous cell carcinoma was the most common type of tumor. P-TNM stage groups were stage II – 56% and stage III – 44%. Average lymph node yield was 12 in two field and 25 in three field clearance. Average proximal margin was 4.6cm and distal margin was 4.7cm. Of the 26 cases operated, 9 patients had post op morbidity. There was no post operative mortality. Average hospital stay was 15 days. Average follow up was for 8.75 months. Three patients developed metastatic disease on follow up.

08. A Case of Growing Teratoma Syndrome

Gaubha Yogesh

Department of Uro Oncology

Summary

24 year old lady was treated in GCRI for Immature teratoma in 1994 to 1996. She was lost to follow up for 11 years. When she came back, she had two large subdiaphragmatic masses. She was resistant to chemotherapy and surgery was the only hope. She was operated by the combined effort of Uro-oncology and oncosurgeon team. Right mass was removed successfully and left is yet to be removed.

09. Role of Intraoperative Frozen Section in the Diagnosis of Ovarian Neoplasms: Experience at GCRI

Sinha Vandana

Department of Gynecology Oncology

Summary

Ovarian neoplasms are an important cause of morbidity and mortality in women. The surgical management of ovarian neoplasms depends on their

correct categorization as benign, borderline or malignant. This study was undertaken to evaluate the accuracy of intra-operative frozen section in the diagnosis of various categories of ovarian neoplasms. Intraoperative frozen section diagnosis was retrospectively evaluated in 127 patients with ovarian neoplasms of doubtful diagnosis who underwent surgery as primary line of therapy at our institution. This was compared with the final histopathologic diagnosis on paraffin sections. 2 patients diagnosed for tuberculosis were excluded from our study. In the remaining 125 patients frozen section report had a sensitivity of 100%, 95.55% and 50% for benign, malignant and borderline tumors. The corresponding specificities were 92.45%, 98.75 % and 99.14% respectively. The overall accuracy of frozen section diagnosis was 95.2%. The majority of cases of disagreement were in the mucinous and borderline tumors. Intraoperative frozen section has high accuracy in the diagnosis of suspected ovarian neoplasms. It is a valuable tool to guide the surgical management of these patients and should be routinely used in all major oncology centers.

10. In-Silico and In-Vitro Approaches to Decipher Imatinib Resistance in CML

Shah Krupa

Division of Medicinal Chemistry and Pharmacogenomics, Cancer Biology

Summary

CML therapy has progressed from nonspecific cytoreductive chemotherapies with limited efficacy to a highly targeted inhibitor with extraordinary efficacy. Resistance is a major problem because it can develop any time and lead to disease progression. The major mechanism underlying this resistance is a number of **mutations** in abl kinase domain, leading to conformational change in kinase domain. In present study, we found three mutations in Imatinib resistant patients by ASO-PCR (C944T-T315I, T1052C-M351I, T932C-F311L). As each mutation has different impact on drug resistance, each mutation studied individually for its implications. Recently, one mechanism underlying resistance was traced to be the induction of α 1 Acid Glycoprotein, a plasma protein that binds imatinib tightly and inhibits its ability to interact with BCR-ABL kinase. AGP, when present at increased concentrations, bound most of STI571 administered, blocked its diffusion from blood to tissues and cells and thus blocked access to biological targets. Therefore, the bioavailability of STI571 can be substantially modified by AGP. In the study it was found that physiologic concentrations of AGP could bind and block STI571. Another pharmacological mechanism is the over expression of P-gp efflux pump induced in response to drug exposure.. Thus the study

of insilico docking of natural compounds with α 1 AGP and P-gp can be helpful for drug designing. Drug resistance promoted by mutational modification constitutes a challenge for drug designers thus faced with a shifting target. More daunting is the problem of re-engineering an inhibitor to overcome the negative design introduced by mutations that confer resistance to the original inhibitor. This study targeted such mutated targets with natural compounds. A combination of in silico, in vitro and in vivo assays need to be validated to inspire a new generation of molecular therapies for shifting targets arising from drug-resistant patterns.

11. Small Round Cell Tumors of Peadiatric Age Group: Histological and Immunohistochemical Correlation

Gupta Mamta

Department of Pathology

Summary

Malignant small round cell tumors are characterised by small, round, relatively undifferentiated cells. They generally include ewing's sarcoma, peripheral neuroectodermal tumor, rhabdomyosarcoma, synovial sarcoma, non-hodgkin's lymphoma, retinoblastoma, neuroblastoma, hepatoblastoma, and nephroblastoma or wilms' tumor. Other differential diagnoses of small round cell tumors include small cell osteogenic sarcoma, undifferentiated hepatoblastoma, granulocytic sarcoma, and intraabdominal desmoplastic small round cell tumor. Differential diagnosis of small round cell tumors is particularly difficult due to their undifferentiated or primitive character. Tumors that show good differentiation are generally easy to diagnose, but when a tumor is poorly differentiated, identification of the diagnostic, morphological features is difficult and therefore, no definitive diagnosis may be possible. Typically, a multimodal approach is employed and the principal ancillary techniques that have been found to be useful in classification are immunohistochemistry and immunophenotyping by flow cytometry, reverse transcriptase polymerase chain reaction (RT-PCR), fluorescence in situ hybridization (FISH), and electron microscopy. However, the recent characterization of chromosomal breakpoints and the corresponding genes involved in malignant small round cell tumors means that it is possible to use molecular genetic approaches for detection.

12. Clinical Significance of Cytogenetic Studies in Acute Myeloid Leukemia

Trivedi Pina

Division of Cell Biology, Cancer Biology

Summary

AML is a very heterogeneous disease at the

cytogenetic and molecular genetics levels. The cytogenetic studies of AML are important to understand the basic genetic mechanisms involved in leukemogenesis as well as to constitute clinically useful tumor markers of diagnostic and prognostic value. The aim of the present study was to evaluate the clinical significance of cytogenetics in AML patients. Bone marrow and peripheral blood lymphocytes of 321 AML patients were collected for conventional cytogenetics and FISH studies. Short term cultures were carried out and GTG banding was done for karyotyping. For FISH and M-FISH; as per standard protocols. Based on cytogenetic data, the AML patients were divided into three cytogenetic risk groups: (i) Favorable risk group (n=109), (ii) Intermediate risk group (n=197) and (iii) Adverse risk group (n=15). In favorable group, secondary changes mainly observed were loss of sex chromosome, del(9)(q), trisomy 8, i(17)(q10), ider(17)(q10) and trisomy 22. Two patients developed clonal evolution and showed additional chromosomal abnormalities. In intermediate group, t(19;20)(q?;?) the novel translocation was identified using M-FISH. 11q23 rearrangements were observed as 7 different translocations. i(11)(q23) was confirmed using *MLL* FISH probe. In adverse group, monosomy 7, del(5)(q) and complex karyotype were observed. From present study it was observed that the sex chromosome loss may relate to neoplastic clone rather than to aging process. Present study highlights the importance of FISH in detecting small deletions in association with AML-M4 and inv (16). Complex karyotypes were

associated with poor prognosis. Several novel, rare, and recurring chromosomal abnormalities were also observed. Diagnostic cytogenetics is widely recognized as one of the most significant prognostic factors in AML and should be performed at the time of diagnosis. Karyotyping and FISH both were found to be complimentary to each other and should ideally be carried out together. This study also highlights the importance of diagnostic cytogenetics as an independent prognostic factor in AML, providing the framework for a stratified treatment approach of the disease.

13. Wilm's Tumor-2011 Scenario at GCRI with Special Reference to Outcome of Treatment

Joshi Nitin

Department of Medical Oncology

Summary

Wilm's tumor is the most common primary renal tumor of childhood. Accounting for 6% of all Childhood cancers. Most patients are < 5 years old. Peak incidence 3-4 years.

Presence of anaplasia, metastasis, bilateral tumor are poor risk factors.

Here we are describing our experience over period of 1 year: CR rate 27%, And death in 27%.

Although the data is immature we can say that the death rate is higher than what is described in the literature. This can be attributed to late presentation, lack of awareness in primary physicians and patients.

**"A doctor's reputation is made by the number of eminent men
who die under his care."**

- George Bernard Shaw

Presentations at the Clinical Meetings

(January 2012 to June 2012)

Sr.	Date	Speaker/Department	Title
1	07.01.12	Shah Mandip Musculo Skeletal Oncology	Protocols for Infection Prevention and OT Discipline Guidelines from Centre Of Disease Control & Prevention
2	07.01.12	Soni Jyotika Prosthesis & Rehabilitation Centre	External Prosthetic Rehabilitation - GCRI
3	28.01.12	Gauba Yogesh Surgical Oncology, Unit V	Experience about Gist at GCRI: A Review of 52 Cases
4	11.02.12	Jolapara Milan Radiodiagnosis	Interventional Radiology in Cancer
5	25.02.12	Patil Priyanka Anesthesiology	Comparison of Saline Flush Test and Internal Jugular Vein Occlusion Test for Detection of Misplaced Subclavian Vein Catheter into Ipsilateral Internal Jugular Vein
6	10.03.12	Patel Kinnari BMT-Medical Oncology	Hematopoietic Stem Cell Transplantation- GCRI Experience (Study of 150 Cases)
7	24.03.12	Deshpande Gururaj Surgical Oncology, Unit II	Surgery for Carcinoma Oesophagus – Our (Surgical Unit II) Experience in last 2 Years
8	14.04.12	Gauba Yogesh Uro Oncology	A Case of Growing Teratoma Syndrome
9	28.04.12	Sinha Vandana Gynecological Oncology Unit I	Role of Intraoperative Frozen Section in the Diagnosis of Ovarian Neoplasms: Experience at GCRI
10	12.05.12	Shah Krupa Medicinal Chemistry & Pharmacogenomics, Cancer Biology	In-Silico – In-Vitro Approach to Decipher Imatinib Resistance in CML
11	26.05.12	Gupta Mamta Pathology	Small Round Cell Tumors of Paediatric Age Group. Histological & Immunohistochemical Correlation
12	09.06.12	Trivedi Pina Cell Biology Division, Cancer Biology	Clinical Significance of Cytogenetic Studies in Acute Myeloid Leukemia
13	23.06.12	Joshi Nitin Medical Oncology, Unit II	Wilm's Tumor- 2011 Scenario at GCRI with Special Reference to Outcome of Treatment

Journal club / Guest lecture / Review lecture Presentations

(January 2012 to June 2012)

Sr.	Date	Presenter/Department	Topic	Authors	Citation
1	11.02.12	Rachh Swati Nuclear Medicine Department	Somatostatin Receptor- Based Imaging and Therapy of Gastroenteropancreatic Neuroendocrine Tumors	Bal CS, Gupta SK, Zaknun JJ.	Trop Gastroenterol. 2010; 31: 87-95
2	10.03.12	Patel Devanshi Microbiology	Should We Use Closed or Open Infusion Container for Prevention of Bloodstream Infection	Manuel S Rangel-Frausto, Francisco Higuera- Ramirez, Jose Martinez-Soto, Victor D Rosenthal	Annals of Clinical Microbiology and Antimicrobials 2010; 9: 6 doi:10.1186/147 6-0711-9-6
3	14.04.12	Patel Deepak Neuro Oncology	The Concepts, Diagnosis and Management of Early Imaging Changes after Radiotherapy for Glioblastomas	P. Sanghera, R. Rampling, B. Haylock, S. Jefferies, C. McBain, J.H. Rees, C. Soh, I.R. Whittle	Clinical Oncology 2012; 24: 216–227
4	12.05.12	Kumar Saurabh Medical Oncology, Unit II	Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening	Aberle DR, Adams AM, Berg CD, Black WC, Clapp JD, Fagerstrom RM, Gareen IF, Gatsonis C, Marcus PM, Sicks JD	N Engl J Med 2011; 365: 395-409
5	09.06.12	K. Ravi Surgical Oncology, Unit III	Delayed Colo-Anal Anastomosis is an Alternative to Prophylactic Diverting Stoma after Total Mesorectal Excision for Middle and Low Rectal Carcinomas	Jarry J, Faucheron JL, Moreno W, Bellera CA, Evrard S	Eur J Surg Oncol 2011;37:127- 33 Epub 2010 Dec 24

Case Presentations for Morbidity, Mortality at Clinical Meetings

(January 2012 – June 2012)

Sr No.	Date	Presenter/Department	Case Discussion
1	28.01.12	Gauba Yogesh Surgical Oncology, Unit V	Two Years of Experience of GIST at GCRI-52 Cases
2	28.01.12	Chaudhari Nitin Medical Oncology, Unit II	Successful Induction on 2 Occasions Outside Induction Room in AML
3	28.01.12	Tank Tanmay Anaesthesiology	Morbidity Mortality Data Presentation of Surgical and Medical Department
4	25.02.12	Patil Priyanka Anaesthesiology	Presentation of A Study- "Saline Flush Test"
5	25.02.12	Kumar Sampath Medical Oncology, Unit II	A Case of APML-Morbidity
6	25.02.12	Tank Tanmay Anaesthesiology	Morbidity Mortality Data Presentation of Surgical and Medical Department
7	24.03.12	Jain Devendra Surgical Oncology, Unit II	An Audit of Surgical Outcomes of Carcinoma Esophagus
8	24.03.12	Tank Tanmay Anaesthesiology	Morbidity Mortality Data Presentation of Surgical and Medical Department
9	28.04.12	Jain Devendra Surgical Oncology, Unit II	A Case of Inoperable Gastrinoma Developed Pancreatitis
10	28.04.12	Tank Tanmay Anaesthesiology	Morbidity Mortality Data Presentation of Surgical and Medical Department
11	26.05.12	Kumar Sampath Medical Oncology, Unit II	A Case of AML-Ss-Mortality
12	26.05.12	Tank Tanmay Anaesthesiology	Morbidity Mortality Data Presentation of Surgical and Medical Department
13	23.06.12	Kumar Tarun Surgical Oncology, Unit III	A Case of Ca Colon with CRF-Mortality
14	23.06.12	Tank Tanmay Anaesthesiology	Morbidity Mortality Data Presentation of Surgical and Medical Department

About the Journal and Instructions for Authors

Gujarat Cancer Society Research Journal is a biannually (April and October) peer-reviewed journal published by the Gujarat Cancer Society (formerly published as GCS Research Bulletin). The journal's full text is available online at <http://www.cancerindia.org>

The Editorial Process

A manuscript will be reviewed for possible publication with the understanding that it is being submitted to Gujarat Cancer Society Research Journal at that point in time and has not been published anywhere, simultaneously submitted, or already accepted for publication elsewhere. The journal expects that authors would authorize one of them to correspond with the journal for all matters related to the manuscript. On submission, editors review all submitted manuscripts initially for suitability for formal review. Manuscripts with insufficient originality, serious scientific or technical flaws, or lack of a significant message are rejected before proceeding for formal peer-review. Manuscripts that are unlikely to be of interest to the Gujarat Cancer Society Research Journal readers are also liable to be rejected at this stage itself.

Manuscripts that are found suitable for publication in Gujarat Cancer Society Research Journal are sent to expert reviewer/s. The journal follows a double-blind review process, therein the reviewer/s and authors are unaware of each other's identity. Every manuscript is also assigned to a member of the editorial team, who based on the comments from the reviewer/s takes a final decision on the manuscript. The comments and suggestions (acceptance/ rejection/ amendments in manuscript) received from reviewer/s are conveyed to the corresponding author. If required, the author is requested to provide a point by point response to reviewers' comments in a separate sheet and submit a revised version of the manuscript with the changes underlined in red. This process is repeated till reviewers and editors are satisfied with the manuscript.

Manuscripts accepted for publication are copy edited for grammar, punctuation, print style, and format. Page proofs are sent to the corresponding author. The corresponding author is expected to return the corrected proofs within two days. It may not be possible to incorporate corrections received after that period.

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3. Submit one copy printed on A4 size papers.
4. Please mail the articles/abstracts on **gcsjournal2012@gmail.com**, alternatively CD (soft copy) can also be sent to room no.303.
5. Manuscripts reporting clinical studies should, where appropriate, contain a statement that they have been carried out with ethical committee approval.
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 - Figures and Illustration (separate page, JPEG print version, Number Arabic numerals (e.g. 1,2,3) as in results, If photographs of persons are used, the subjects or patients should not be identifiable).
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 - References (separate page, number references consecutively in the order in which they are first mentioned in the text. Identify references in the text in numerals in superscript). Only recent (not more than fifteen years old unless historical) references should be used.
 - Acknowledgement

Units and Abbreviations

Avoid abbreviations in the title and abstract. All unusual abbreviations should be fully explained at their first occurrence in the text. All measurements should be expressed in SI units. **Drug names** Generic drug names should be used.

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The title page should have the following:

- Type of manuscript (article/case report)
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- The name by which each contributor is known (Last name, First name and initials of middle name), with institutional affiliation
- The name of the department(s) and institution(s) to which the work should be attributed
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- The total number of pages and total number of photographs
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- Uniformly American English
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Summary: Summary no more than 250 words for original article and 150 words for Case Report. Should have following headings: Introduction (state the purposes of the study or investigation), Materials and Methods (selection of study subjects/patients, observational and analytical methods), Results (give specific data and their statistical significance, where ever possible), and Conclusion (succinct emphasis of new and important aspects of the study or observations). Do not use symbols in the Summary; rather, spell out what they stand for in full.

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Identify precisely all drugs and chemicals used, including their generic names, their manufacturer's name, city and country in parenthesis, doses, and routes of administration.

Results: Present your results in a logical sequence in the text, Tables, and Illustrations. Do not repeat in the text all the data in the Tables or Illustrations. Emphasize or summaries only important observations. Specify the statistical methods used to analyze the data. Restrict Tables and Illustrations to those needed to explain the argument of the paper and to assess its support. Where

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Discussion: Emphasize the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or other material given in the Introduction or the Results section. Include in the Discussion section the implications of the findings and their limitations, including the implications for future research. Relate the observations to other relevant studies.

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Illustrations (Figures) and Legends for Illustrations: All Illustrations must be submitted in JPEG print version that is ready for reproduction. Figures should be numbered consecutively in Arabic numerals (e.g. Fig. 1, 2, 3) according to the order in which they have been first cited in the text. If photographs of persons are used, the subjects or patients must not be identifiable. Present the legends for illustrations using double-spacing, with Arabic numerals corresponding to the Illustrations.

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Standard Journal:

You CH, Lee KY, Chey RY et al: Electrogastrographic study of patients with unexplained nausea, bloating, and vomiting. *Gastroenterology* 1980; 79:311-314

Online journal article:

Miyamoto O, Auer RN: Hypoxia, hyperoxia, ischemia and brain necrosis. *Neurology [serial online]* 2000; 54:362-71. Available at: www.neurology.org. Accessed February 23, 2000.

Chapter in a book:

Weinstein L, Swartz MN: Pathogenic properties of invading microorganisms. In: Sodeman WA Jr, Sodeman WA, eds. *Pathologic Physiology: Mechanisms of Disease*. Philadelphia: Saunders, 1974: 457-472

Online book or website:

Garrow A, Weinhouse GL: Anoxic brain injury: assessment and prognosis. In: *UpToDate Cardiovascular Medicine [online]*. Available at: www.UpToDateInc.com/card. Accessed February 22, 2000.

In press:

Lillywhite HB, Donald JA: Pulmonary blood flow regulation in an aquatic snake. *Science*. In press.

Community Oncology Centre

The Community Oncology Centre (COC) is created with the help of generous donation from Late Shri Rajendrabhai Dwarkadas Thakore and Lion Bharat Kshatriya. It is a unique centre of its kind for last 20 years. Its initially area of work was hospice activity. For last 12 years its activities have increased in preventive and diagnostic work. Functioning of this centre is different from other hospitals. Its main emphasis is based on community related work: academic, research, preventive etc. We can divide the activities of this centre as under:

- a) Care of terminally ill patients as a part of hospice.
- b) Cancer awareness permanent exhibition for school and college children in particular and public at large.
- c) Lecture avenue and lecture hall for the cancer awareness functions.
- d) Health check up scheme for early detection of cancer.
- e) Breast cancer help-line for all the queries arising from State of Gujarat as regards early detection and treatment of breast cancer.
- f) Social and cultural activities of the Institute and Society.
- g) Madan Mohan Ramanlal Urban Health Centre.
- h) Cancer Control Activities.

1. Education and Awareness:

We all know cancer is a very complicated and challenging disease. Its incidence has increased with modern life style, particularly oral cavity cancer problem has increased because of the habits like tobacco chewing and smoking. It is important to bring awareness in the community, particularly school and college going students, so they may know the hazards of tobacco and smoking. We have a permanent exhibition of cancer that educates the society and gives scientific information of the disease and also warns against tobacco and smoking. Nearly 65000 visitors viewed this exhibition during last decade. They included various students from schools, medical, paramedical and nursing colleges, teachers, tutors and different NGOs of the state.

2. Cancer Related Health Check up:

Several warning signals of cancer are known. They often herald presence of disease in an advanced stage. Cancer is curable or prolonged survival is possible only if the disease is detected in its early stage. Moreover, certain common cancer problems of

our country are preventable or curable, e.g. oral cavity cancer, breast cancer and cancer of cervix. We are running cancer related health check up programme at this centre for last 12 years for early detection of cancer like oral cavity cancer, breast cancer and cancer of cervix.

Daily average 30 people take advantage of this activity, especially the middle class of the society. We do it at a concessional price of very Rs 500 only. Regular Health Check-ups are carried out for early detection of cancer at this centre. Different diagnostic facilities for Cancer Screening are also available i.e. mammography, X-rays, sonography, pap smear, FNAC, biopsy etc. More than 7000 persons are screened for cancer per year and various tests and imaging studies are performed

3. Hospice:

At the COC, terminally ill patients with cancer are given shelter, warmth and palliative care as a part of hospice service. The patients are referred to us by cancer clinicians. Emergency services like Ryle's Tube insertion, catheterization, pain relief, IV injection treatment etc. are being provided. A beautiful environment is provided and all efforts are made to ease their suffering and make their life comfortable in the small huts with all facilities. Their entertainment is specially looked after. We developed 1st hospice centre of its kind in India at COC in 1990 with capacity of 10 beds. Last year 103 patients were admitted in hospice. Average stay of the patients at Hospice Centre is 10-12 days and average income of taking advantage of hospice is around 2500/- month.

4. Madan Mohan Ramanlal Urban Health Centre:

As a part of Community Service and to serve larger section of people, Gujarat Cancer Society along with Indian Institute of Management, Ahmedabad Municipal Corporation and Akhand Jyot Foundation has developed Madanmohan Ramanlal Urban Health Centre. The activity of Urban Health Centre include (1) Family Planning Services, (2) Vaccination Centre, (3) DOT Centre, (4) Anti-natal Care Centre, and (5) Leprosy Centre.

5. Cancer Control Activities:

Through various activities mentioned above as well as participation in the HPV vaccine trial of WHO, the Centre is active in Cancer Control Programme.

All donations are exempted from Income Tax under IT Act 35(i)(ii)(175%), 35AC(100%) and 80G(50%) and donations in Foreign Currencies accepted approval vide Reg. No.041910257, dated 22-03-2001. Visit us at <http://cancerindia.org> E-mail: gcriad1@sancharnet.in

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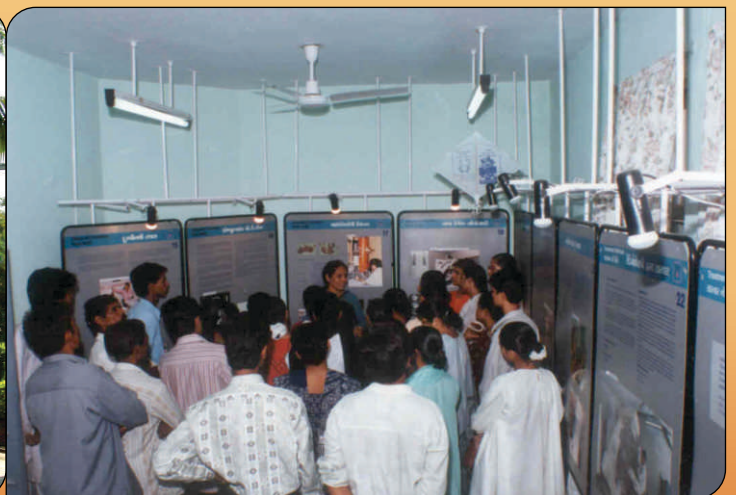
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