

Introduction: Granulosa cell tumors comprise approximately 5% of all ovarian malignancy and account for 70% of malignant sex cord stromal tumors. Granulosa cell tumors have been diagnosed from infancy, the peak incidence being perimenopausal age. The potential of malignancy of these tumors is low, recurrences are often late and found in 10-33% of cases.

Case Report: A 32-year-old P1L1 presented with large abdominal mass for which she underwent staging laparotomy with debulking surgery. She was a known case of granulosa cell tumor in the past and had undergone three laparotomies, along with chemotherapy. At the age of 13 years, she was diagnosed with a stage IA granulosa cell tumor (GCT) of the ovary first time. She underwent surgical staging and removal of left sided adnexal mass, after which she was asymptomatic for 7 years. In 2003 she again presented with lump abdomen for which she underwent resection of adnexal mass, histopathology was consistent with recurrent GCT. After second surgery she also received two cycles of chemotherapy. Despite adjuvant chemotherapy, patient presented again after three years in 2006 with adnexal mass and was found to have a third recurrence. At that time, she received 6 cycles of chemotherapy and the mass regressed. Meanwhile she got married and had one child. After four year in 2010 she again presented with lump abdomen and she underwent surgical staging, total abdominal hysterectomy with right salpingo oophorectomy along with removal of mass. After five year in 2015 she again presented with lump abdomen; there was a large pelvic mass which was removed and patient referred for chemotherapy.

Discussion: GCTS which a rare malignant tumors of ovary tend to be associated with late recurrences. Although most recurrences occurs within 10 years after initial diagnosis, there are occasional reports of recurrences after 10 years. We experienced the rare case of a patient who relapsed multiple times over 20 years, despite surgical and targeted treatment. In conclusion the long history of granulosa cell tumor highlights the importance of extended follow up of the patient.

Key words: Granulosa cell tumor; recurrent disease; chemotherapy; surgical staging

Ovary: Oral Abstract

Role of IL-6 and VEGF in epithelial ovarian cancer

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Introduction: Over the last two decades there is a trend toward increasing incidence of ovarian cancer cases. CA-125 and some other tumor markers are known to have prognostic importance. Some cytokines have also been studied for their role in prognosis; IL-6 and VEGF are among them. It is hypothesized that these cytokines might affect the clinical progression of patients with ovarian cancer.

Aim and Objectives: To measure and correlate the effect of levels of IL-6 and VEGF in ascitic fluid on presentation, treatment response and outcome in patients with epithelial carcinoma ovary and to determine whether levels of IL-6 significantly correlate with progression-free survival.

Materials and Methods: Thirty patients with epithelial ovarian carcinoma and 15 patients who were undergoing hysterectomy for benign condition were recruited. Once patients found fit for study, they were taken up for primary debulking surgery. Ascitic fluid was collected and sent for measuring IL 6 and VEGF levels. Peritoneal washings taken from patients posted for total abdominal hysterectomy for benign pathology was used as control to achieve the values of IL-6 and VEGF in the study population. Patients were followed up for 1 year after surgery with ultrasound abdomen and pelvis and serum CA 125 levels.

Results: Median value of IL-6 in ascitic fluid was 8563.18 pg/ml in EOC cases and 17 pg/ml in benign pathology group and of VEGF was 6090.35 pg/ml and 34.01 pg/ml, which were found to be significantly higher in cases compared to control group ($p = 0.0001$). Levels of VEGF was significantly higher in patients with positive ascitic fluid cytology ($p = 0.009$) and ascitic fluid volume $> 1L$ ($p = 0.021$). Correlation of VEGF and IL6 levels with other prognostic was not statistically significant. Levels of IL-6 and VEGF in ascitic fluid did not correlate statistically with survival time or with recurrence ($p = 0.651$).

Conclusion: Levels of VEGF in ascitic fluid were found to correlate with ascitic fluid cytology and volume but not with FIGO stage, histological grade, histological type, tumor size, residual tumor, CA 125 levels, chemotherapy response, presentation and with overall outcome and survival time. None of the above mentioned prognostic factors were found to correlate with levels of IL-6 in ascitic fluid.

Ovary: Oral Abstract

Clinico-pathological characteristics of epithelial ovarian malignancy in young female

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Background and Objective: Epithelial ovarian cancer mostly appears in aged women, but rarely in young women. Little is known about the clinical characteristics and prognosis of epithelial ovarian cancer in women aged below 40 years. This study was to evaluate the clinical and histopathological characteristics of young patients with epithelial ovarian cancer.

Methods: A total of 31 patients with confirmed epithelial ovarian cancer under the age of 40 years between 2007 to 2015 were retrospectively analyzed.

Results: Mean age of the patient is 32 years. The common symptoms included abdominal pain (21 patient 67%), self detected pelvic mass (9 patient 29%) and 1 patient with bleeding per vaginum. The average maximum diameter of tumour is 10.7 cm. Family history positive in 8 patient (5 ca.breast and 3 ca.ovary). Mean level of CA.125 is 883.36 u/ml.CA 125 level lowest is of 6 u/ml and highest is of 7557 u/ml. Tumour located bilaterally in 14 patient (45%). Ascitis present in 18 patient (58%). Pleural effusion seen in 6 patient (19%). Twenty six cases underwent optimal cytoreduction out of them 7 taken NACT.Two patient underwent fertility preservation surgery.Three patient underwent palliative chemotherapy due to unwillingness. Eleven patient classified as stage III and stage IV each (35% of each), six patient is of stage I (19%) and three patient of stage II (9.6%). Serous adenocarcinoma (80.6%) and mucinous adenocarcinoma (19%) are the common histopathological findings. Thirteen patient (41.9%) has well differentiated tumour, eight (25.8%) has moderately differentiated and ten (32.25%) has poorly differentiated tumour. Twenty eight patient received platinum and paclitaxel-based chemotherapy before or after operation.

Conclusion: Young women with epithelial ovarian cancer under the age of 40 years mostly have serous adenocarcinoma; well differentiated and tumors are normally bilateral. The ovarian function can be preserved (fertility preservation) in part of stage Ia and Grade I patients.

Ovary: Oral Abstract

Role of CA 19-9 in complex ovarian tumors

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Background: Cancer antigen 19-9 (CA 19-9) is a tumor-associated mucin glycoprotein antigen that may be elevated in healthy individuals as well as in patients with benign and malignant tumors. It is useful in the management of pancreatic and other gastrointestinal tumors. CA 19-9 is also elevated in benign and malignant ovarian tumors.

Aim: To study the pattern of serum CA19-9 in complex ovarian tumors.

Methods: The study design was descriptive, based on data collected from medical records. Patients with a complex ovarian mass, who were investigated with CA 19-9 and had undergone surgery, were included in the study. The study duration was 2 years from January 2014 to December 2015. A total of 273 patients (119 - benign and 154 malignant) with complex ovarian mass and elevated CA 19-9 underwent surgery during the study period.

Results: CA 19-9 was elevated in 55 patients (20%). Of these, 23 patients had benign tumors while 32 had malignant tumors.

Among patients with benign tumors, 21 had dermoid, 23 had mucinous tumors and 75 had other types of tumors. CA 19-9 was elevated in 10 (47.6%) of the dermoids, 7 (30.4%) of the mucinous tumors and 6 (8%) of the other benign tumors. Among patients with malignant tumors, 138 were epithelial and 16 were non epithelial tumors. Of the epithelial tumors, 31 were mucinous and 107 were non mucinous types. Overall, 29 (21%) had elevated CA 19-9. Of the epithelial tumors, 22.6% of the mucinous type and 20.6% of the non mucinous type had elevated CA 19-9. Among the non-epithelial tumors, 3 (18.8%) had elevated CA19-9.

Conclusion: CA 19-9 is elevated in several conditions but most likely to be raised in dermoid cysts and mucinous tumours. CA19-9 levels need to be interpreted along with clinical and radiological findings.

Ovary: Oral Abstract

Clinical outcomes of cytoreductive surgery and HIPEC in advanced and recurrent epithelial ovarian cancers with peritoneal carcinomatosis

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Introduction: The role of surgery for peritoneal carcinomatosis (PC) has slowly evolved from palliation to potential curative intent. Attempting to remove all visible tumor deposits, "surgical cytoreduction" (CRS) was reported in 1930s for ovarian cancer and eventually became an accepted therapy with proven survival benefit. The new approach of combining CRS and hyperthermic intraperitoneal chemotherapy (HIPEC) to treat peritoneal metastasis offer hope for long term survival in this group of patients. The risk and benefit of this approach continued to be debated. A prospective study was conducted to understand the perioperative outcomes of CRS and HIPEC. **Aim:** To evaluate the perioperative outcomes associated with CRS and HIPEC in Advanced and Recurrent Epithelial Ovarian Cancer with PC.

Method: Prospective analysis of patients undergoing CRS and HIPEC from November 2014 to July 2015 was done. Inclusion criteria included localized disease in peritoneal cavity, no distant metastasis and PS <2. Grade 3/4 complications from day of surgery until 30 days postoperatively were recorded.

Results: We performed CRS and HIPEC in 20 patients from November 2014 to June 2015. HIPEC Plus regimens included Cisplatin (50 mg/m²) and Lipodox (15 mg/m²) intraperitoneally and Ifosphamide (1300 mg/m²) and Mesna (260 mg/m²). Infusion time was 90 minutes with a temperature range of 41-43°C. Out of 20 patients 6 (30%) underwent primary debulking surgery and 14 (70%) underwent secondary debulking surgery. PCI score ranged from 2-26 (mean 13.65). Mean operating time was 6.42 hrs and average blood loss was 1046 ml. Average hospital stay was 8 days and SICU stay was 4.9 days (range 3-14 days). Total 26 adverse events were observed of which grade 1 were 11 (42%), grade 2 were 8 (30%), grade 3 (11.5%) and grade 4 were 2 (8%). Most common complication was hematological (8) followed by respiratory (6), sepsis (4) renal (2), GI (2). 4 patients (5 events) developed grade 3 or 4 complications in the form of septicemia, pulmonary embolism, GI fistula of which 2 patients expired and remaining recovered although required prolonged hospitalization. Increased morbidity were observed in cases with symptomatic relapse, higher PCI score and CA 125 level higher than 250 U/ml. Most of the adverse events were grade 1 and 2 and were managed by observation only or GCSF support, transfusions and other minor interventions. The combined grade 3-4 morbidity was 20% (4 out of 20) which consisted of neutropenia, infection and respiratory complications. One patient required relaparotomy and two patients expired attributed to pulmonary embolism and septicemia respectively.

Conclusion: Enthusiasm associated with improvement in survival is often dampened by increased perioperative mortality and morbidity figures and therefore CRS and HIPEC has not yet been considered standard of care by many centres. HIPEC after extensive cytoreductive surgery for ovarian cancer is a procedure with acceptable morbidity that patients can tolerate. More follow up is needed to determine the effect of HIPEC on survival. Till such time more data are obtained by way of larger randomised trials, this approach remains investigational.

Ovary: Oral Abstract

Audit on the role and efficacy of PET/CT in recurrent ovarian cancer settings in a tertiary care centre in India

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Ovarian cancers tend to recur in 15-70% cases. CA-125 - is a tumor marker used for monitoring therapeutic response, and in surveillance, for recurrent disease. However, it has a limited role as a persistent high level can signify either recurrence or persistence of residual tumor. Metastases from ovarian

cancer primarily involve the peritoneum rather than parenchymal sites; thus, the presence of small-volume recurrence or metastatic deposits on the visceral surfaces poses a challenge for interpretation of CT and MR images. PET/CT utilizes its property of higher accumulation in malignant cells to provide both anatomic and functional information for diagnosing malignant tumors.

Objectives: The objectives of the study were to find the correlation between PET/CT findings and final histopathological diagnosis after a secondary cytoreductive surgery in suspected ovarian cancer recurrences.

Materials and Methods: PET/CT was done in cases with rising or above normal CA-125 and no radiological findings. These patients with abnormal PET/CT findings were taken up for a secondary cytoreductive surgery and histopathological proven were taken as the standard against which PET/CT positive findings was compared.

Results: The mean age in our group of patients with suspected recurrence was 53 years (Range 39-74 years). Of the 52 patients with suspected recurrence, 40 patients with a PET-CT scan with findings suggestive of an avid uptake underwent surgery. 22 patients had serous histology, 12 mucinous and 8 had clear cell carcinoma. Stage-wise distribution at the time of primary surgery is as follows stage I-3, stage II-7, stage III-26, stage IV-4. Of the 40 patients who underwent a second look surgery 32 had histopathologically confirmed recurrence. PET-CT detected a total of 86 lesions in the 40 patients who underwent surgery. Of these, 38 were in the lymph nodes 28 in para-aortic and 10 in pelvic, 32 were peritoneal lesions and 14 were pelvic, 2 were metastatic in the parenchyma of liver. Detection of the lesion on PET-CT was size dependant, of the 9 lesions were missed on PET-CT, 7 were less than 0.5 cm. The mean diameter of the lesions detected was 2.2 cm (range 0.3-6.2 cm). PET-CT accurately identified 62 of 70 histopathologically proven lesions. The overall lesion-based sensitivity of PET-CT is 88.6%, specificity 56.2%, Positive predictive value being 72.1%, negative predictive value of 69.2%. Accuracy of detecting lesions greater than 1 cm is 78.6% (44 of 56 lesions).

Conclusions: Correlation between PET/CT and histopathological disease: k (cohen value) = 0.81 which suggests excellent correlation. For selected patients with ovarian cancer recurrence may benefit from a comprehensive radiographic imaging survey (PET-CT) at the time of even no or minimal CA-125 elevation in early detection and successful cytoreductive surgical resection and an increase in overall survival.

Ovary: Oral Abstract

Clinicopathological review of epithelial ovarian tumors in young females and reproductive and survival outcome: Ten years experience from a tertiary center

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Objective: To find out the prevalence of epithelial ovarian tumors in young females and correlation with reproductive and survival outcome.

Design: Retrospective study.

Setting: Tertiary referral hospital.

Methods: A retrospective analysis of females from 9-35 year of age group treated for ovarian tumors between January 2003 to July 2013 was performed. Variables studied included age, presenting symptoms, imaging, tumor markers, surgical findings, type of surgery, histopathology reports and follow-up.

Main Outcome Measures: Histopathological variant, FIGO stage, reproductive and survival outcome.

Results: A total of 155 patients were found to have ovarian tumors. Mean age at time of diagnosis was 24.9 ± 1.8 years (range 9-35). Clinical presentation in majority of the cases was abdominal pain in 68 (43.8%), ascites in 13 (8.3%) mass in abdomen in 25 (16%), followed by irregular menstrual cycles in 15 (9.6%), infertility in 18 (11.6%) 12 (7.7%) were found to be incidental on ultrasound examination while 4 women were found to have virilising symptoms. There were 76 (49.1%) cases of epithelial ovarian tumors, 6 (0.03%) of borderline tumors and 30 (19.3%) were of malignant ovarian tumors while 40 (25.8%) were benign. Stage IA (N = 80), Stage I 8 (N = 2), Stage III (N = 6) and Stage IV (N = 12). Females were further subdivided into three age groups 9-15 years, 15-25 years and 25 to 35 years for determining outcome of epithelial tumors. Reproductive and survival outcome were studied in each stage.