Intra-operative Imprint Cytology of Dysgerminoma- A Case Report

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Abstract:

Ovarian neoplasms can be either epithelial, stromal or germ cell origin. Dysgerminoma is a rare ovarian germ cell tumor accounting for 1- 2% of all ovarian malignancies. Fine needle aspiration cytology of the ovaries are relatively inaccessible because of its deep location. Distinguishing most of the tumors on the basis of clinical and gross features are difficult. Diagnosis of ovarian tumours on imprint cytology is quite challenging. We report a case of ovarian dysgerminoma in a 28 year old female presented with abdominal pain and mass. An abdominal ultrasound showed left ovarian tumor and laprotomy was performed. Intraoperative imprint cytology showed hypercellularity having round to polygonal cells on a tigroid background. Based on these features diagnosis of dysgerminoma was made which was confirmed on frozen section and histopathology.

Key words : Dysgerminoma , Imprint cytology, Intraoperative diagnosis.

Introduction:

Preoperative diagnosis of ovarian lesions by fine needle aspiration (FNAC) is relatively inaccessible because of its deep location and image guidance is must for the FNAC of ovarian tumor.[1,2] FNAC can also cause intraperitoneal seeding and dissemination of ovarian cancer. Risk of of ovarian cancer dissemination can be avoided by using intraoperative imprint cytology(IOC).[1,3] Frozen sections are usually employed for intraoperative evaluation but is expensive. Shahid M *et al*[1] in their study mentioned that Dudgeon and Patrick introduced imprint cytology as a tool for intraoperative diagnosis in 1927. They also mentioned that according to study done by various authors intraoperative cytology takes 2minute to 13minute for evaluation whereas frozen section takes 10minute to 25minute for diagnosis.[1] Thus IOC is less expensive and rapid as compared to frozen section.

Case report:

A 28 year old female presented to the out patient department of gynaecology with history of pain abdomen since 2 days which was insidious in onset, gradually progressive in nature and was radiating to back and thigh. Patient also gave history of mass per abdomen since 2 months. Her obstetric history was para 3, living 3 with history of last child birth 4 months back. Her medical and gynecological history was otherwise uneventful.

A large, well defined, solid, mobile mass measuring 20X20cm was noted on abdomen and pelvic examination. Borders of the mass were well made out except the lower border. Mass was bimanually ballotable.

Sonographic evaluation demonstrated a well defined left adnexal mass measuring 14X10cm with focal areas of necrosis. Minimal vascularity was noted on color doppler. Based on clinicoradiological features a diagnosis of malignant left ovarian tumor was made, hence CA125 assay was done which was 7.95U/ml (normal range < 35 U/ml).

Laprotomy was planned and at laprotomy left ovarian mass was noted which was not adherent to pelvic structures. Pelvic or para aortic lymph nodes were not enlarged. Left ovarian mass with attached fallopian tube was resected and sent for frozen. On gross examination mass was encapsulated and nodular with breech in capsule at places. Mass was measuring 12X9X5cm. Cut section was predominantly solid pale white, with focal areas of necrosis and hemorrhage along with 3 cysts varying in size from 0.6X0.5cm[Fig 1]. Imprint smears of the mass were prepared. Rapid H & E, PAP stain was done. Rapid PAP stain was done by fixing smears in methanol for 30 second, hematoxylin

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stain for 1 minute, rinsed in tap water then 1 dip in acid alcohol and kept for blueing in water for 2minute then 1 dip each in absolute, 70% and 50% alcohol (graded alcohol). Later 1 dip in OG-6, rinsed in graded alcohol and 1 dip in EA-36 followed by rinsing in graded alcohol. Clearing in xylene and mounted using DPX. Simultaneously, tissue from ovarian mass was processed for frozen section.

Imprint smears showed hypercellularity with cohesive clusters of tumor cells which were round to polygonal with round to oval vesicular nucleus having prominent nucleoli and vacuolated cytoplasm admixed with lymphocytes in a tigroid background.[Fig 2,3] Based on these features and characteristic tigroid background, cytological diagnosis of dysgerminoma was made.

Routine histopathology processing of left ovarian mass showed tumor tissue arranged in nests, trabecular pattern, cords and sheets separated by thick and thin fibrous septae which were infiltrated by lymphocytes. Individual tumor cells were round to polygonal with round to oval vesicular nucleus having large prominent eosinophilic nucleoli and abundant clear to granular eosinophilic cytoplasm. 4-6 atypical mitotic figures/10 HPF were noted along with focal areas of necrosis, hemorrhage and hyalinised blood vessels.[Fig4]

Postoperative course was uneventful. On followup after one and half years, patient presented with retroperitoneal mass. CT scan showed heterogenous mass in retroperitoneum and displacement of adjacent structures causing hydroureteronephrosis. Tru-Cut biopsy of retroperitoneal mass was done which showed features of dysgerminoma.

Discussion:

Dysgerminoma is the most frequent malignant ovarian tumor in children and young female upto 3rd decade with disease presentation in early stage.[4,5] It is the tumor arising from the germ cell of ovary and accounts for 50% of primitive germ cell tumors of ovary.[5,6] According to WHO dysgerminoma is defined as 'A tumour composed of a monotonous proliferation of primitive germ cells associated with connective tissue septa containing varying amount of lymphocytes and macrophage. Occasionally, syncytiotrophoblastic differentiation or somatic cysts can be seen.[7] Dysgerminoma is well encapsulated tumors. 90% of the cases are unilateral and only 10% show bilateral involvement.[8] Recurrence are noted in contralateral ovary, retroperitoneum and para-aortic lymphnodes.[5]

Intraoperative diagnosis of various tumors are done by imprint cytology but it is not widely used in the diagnosis of ovarian neoplasms. Only few studies of intra operative diagnosis of imprint cytology of ovarian tumors have been done for its accuracy and validity.[3] Intraoperative imprint cytology gives faster result within 15minutes and is useful in conservative surgery in young patients to preserve fertility.[10]

Dey S *et al*[2] studied role of intraoperative imprint cytology in diagnosis of suspected ovarian neoplasms. 30 cases were included in their study, out of which 28 cases correlated with histopathological diagnosis. In their study only 1 case of dysgerminoma was reported on imprint cytology and it was correlated with histopathology.

Tushar K *et al*[3] in their study on intra-operative cytology of ovarian tumors showed 89.55% diagnostic accuracy when compared with histology. They included 53 celomic epithelial and 14 non-celomic ovarian tumors. Out of 67 cases, 41 were benign and borderline tumors and 26 were malignant. In their study, out of 4 cases of dysgerminoma 3 cases of pure dysgerminoma were accurately diagnosed and in only 1 case of mixed germ cell tumor with sex cord stromal tumor, diagnosis of second component was missed.

Abe A *et al*[10] retrospectively studied the usefulness of intraoperative diagnosis based on imprint cytology and frozen sections for ovarian germ cell tumor. 23 cases of germ cell tumor were included in their study. Discrepancies between intraoperative imprint cytology and definitive histologic diagnosis were seen in 6 out of 23 cases. Their study had 6 cases of dysgerminoma out of which 5 cases correlated with histology.

Mohammad Shahid *et al*[1] in their study on **the role of intraoperative cytology in the diagnostic evaluation of ovarian neoplasms** showed 95.8%, 96% and 95.8% sensitivity, specificity and diagnostic accuracy respectively in comparison with histopathology. 50cases were submitted for intraoperative imprint cytology out of which 47 cases correlated. Out of 50 tumors, 25 were benign, 5 borderline and 20 mailgnant. In their study, there were 2 cases of dysgerminoma having 100% concordance with histopathology.

In ovarian lesions, IOC has been reported to have a diagnostic accuracy comparable to that of frozen sections. There are several advantages of IOC over frozen sections. IOC is simple and cost effective method, morphological details are well maintained without any freezing artifacts, tissue loss is not seen

like in case of cryostat, possibility to identify focal neoplastic lesions in larger specimens, other minute details like adipose tissue, necrosis and calcification can be made out, diagnosis of malignancy in smaller tissues and safely handled and contamination is avoided. Imprint cytology is also helpful in staging of the neoplasm, follow-up of postoperative cases and for recurrences. Flow cytometry and cytogenetic analysis can be done by the materials obtained by this method.[3]

Conclusion:

IOC can be used in a diagnosis of ovarian tumor in a setup where frozen facility are not available, as IOC is simple, fast and cost effective method and aids in planning of the treatment like fertility sparing surgery since it is reliable.

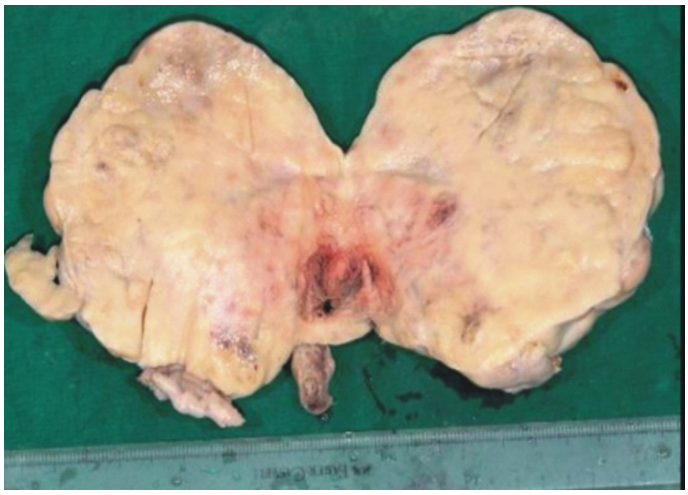

Fig 1- Gross photograph of ovarian tumor - Solid pale white with focal areas of necrosis and hemorrhage

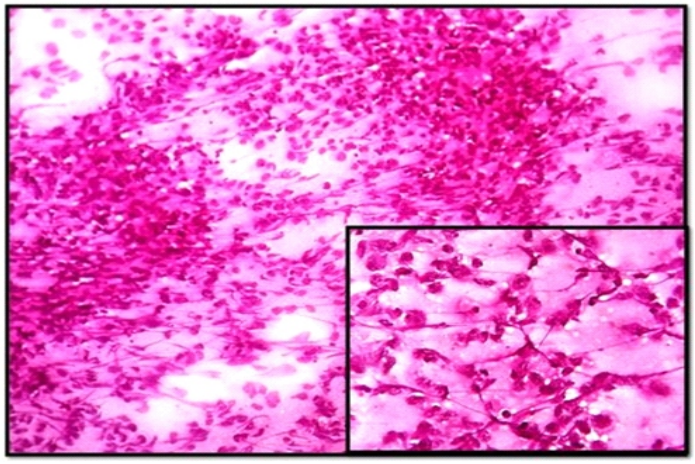

Fig 2- Photomicrograph of the imprint smear showing hypercellularity and cohestive clusters (PAP, X 100). Inset: Cells showing vesicular nucleus and prominent nucleoli (PAP, X400).

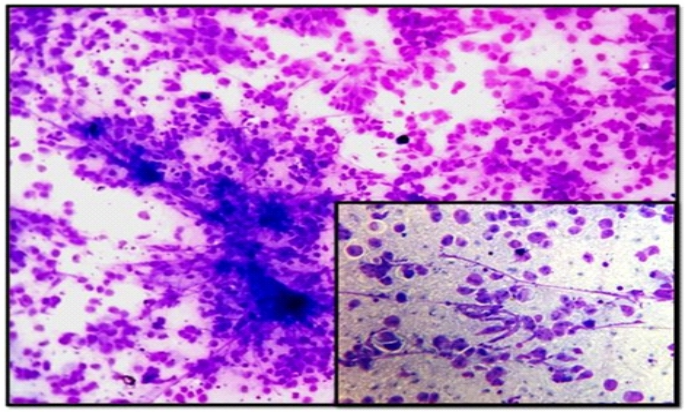

Fig 3- Photomicrograph of the imprint smears showing tigroid background (Gimesa, X 100). Inset(Gimesa, X400).

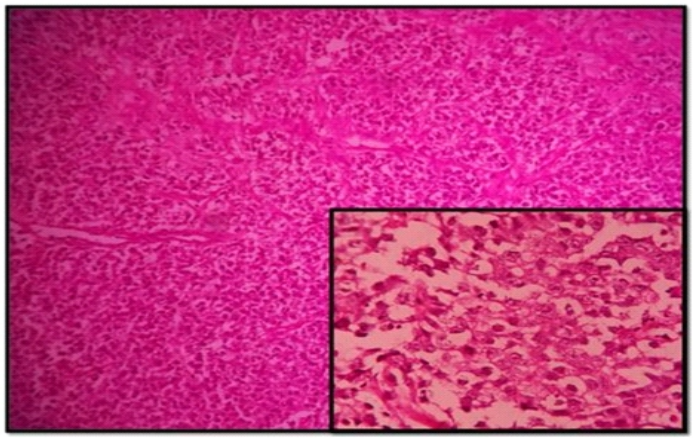

Fig 4- Photomicrograph of the section showing tumor tissue arranged in sheets separated by thin fibrous septa(H&E, X 100). Inset individual cells having vesicular nucleus and prominent nucleoli(H&E, X400).

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