Imprint Cytology Of Immature Teratoma - A Diagnostic Challenge

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ABSTRACT

Immature ovarian teratoma (IOT) is characterized by immature neuroectodermal tissue. Its cytomorphology on imprint smears has rarely been discussed in literature. A 22 year old unmarried nullipara presented with a pelvic mass which was resected and sent for imprint cytological evaluation followed by histopathological evaluation. Imprint smears revealed small round cell morphology with rosette like structures. Cytomorphology was suggestive of IOT which correlated with histological findings. Differential diagnosis of IOT includes other small round cell neoplasms such as ovarian neuroblastoma (NB), small cell carcinoma, primitive neuroectodermal tumor (PNET), desmoplastic small round cell tumor, Non-Hodgkin lymphoma (NHL), Yolk Sac tumor (YST). Distinguishing IOT from these tumors can be strenuous; however if meticulous morphologic studies are performed, accurate diagnosis is possible.

INTRODUCTION

Immature mature ovarian teratoma (IOT) represents 1% of all ovarian tumors and 3% of all teratomas [1]. Patients present with abdomino-pelvic mass associated with pain and raised serum alpha-fetoprotein levels. IOT manifests as unilateral, large, solid and cystic mass that spreads beyond the ovaries in 33% of the cases. [2] We in this poster portray the cytomorphology of IOT on Imprint smears which has rarely been discussed in literature.

CASE HISTORY

22 year unmarried nullipara presented with heaviness and distension in the lower abdomen associated with pain since 1 month and elevated serum AFP levels. Per abdominal examination revealed a globular & firm mass of 18 to 20 weeks gravid uterus size, with restricted mobility in hypogastrium. Laparotomy was done followed by resection of adnexal mass

Table 1. Differential diagnoses of IMT on cytology[3]

Features	IOT	PNET	NB	NHL	YST
Small round cells	Dispersed clusters	Dispersed clusters	Dispersed	Dispersed	-
Rosettes in Fibrillary matrix	+	+/-	+	-	- (appearance similar to schiller- duval bodies)
Spindle cells	+	+/-	+	-	-
Other findings	Squamous cells, Glandular cells	Chief cells	-	Lympho-glandular bodies	Schiller duval bodies, elevated serum AFP levels

GROSS & IMPRINT CYTOLOGY

We received an encapsulated mass measuring 10 x 10 x 6cm. Outer surface was smooth & congested with areas of capsular breech at places. Cut surface showed heterogeneous solid- cystic and haemorrhagic areas.

Imprint smears were hypercellular showing mostly uniform small round cells with high nucleocytoplasmic ratio, uniform granular chromatin, scant cytoplasm. Cells were arranged in small clusters (**rosette like pattern**), sheets as well as lying singly in a fibrillary background. Occasional scattered anucleate squames were also evident. A diagnosis of Malignant Germ Cell Tumor was proposed with differentials of IOT, YST and PNET.

HISTOLOGY

H&E sections showed a admixture of mature and immature components. Mature tissues include keratinous cysts lined by stratified squamous epithelium, dermal appendages, mucinous glands, cartilage and smooth muscle. Immature tissue comprise of numerous tubules and rosettes of primitive neuroectodermal cells; sheets of glial tissues were also seen. Based on these findings a definite diagnosis of **Immature ovarian teratoma - Grade III** was made.

Figure 2. HPE image showing immature neural tissue arranged in tubules and rosettes (a, d) , keratinous cysts lined by stratified squamous epithelium, dermal appendages, cartilage, smooth muscle, mucinous glands (b) and sheet of glial tissue(c). (H&E. 20x)

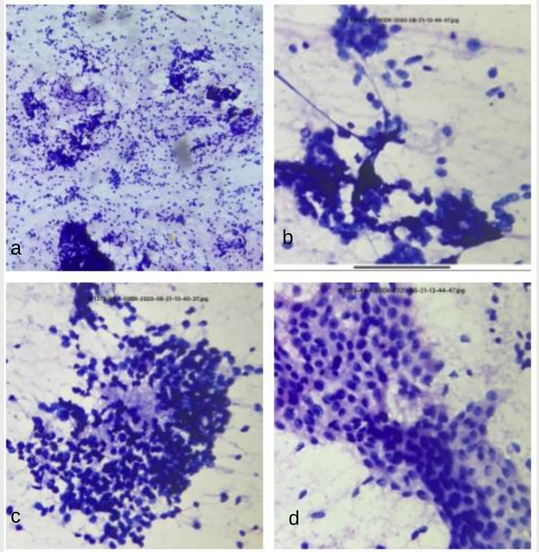
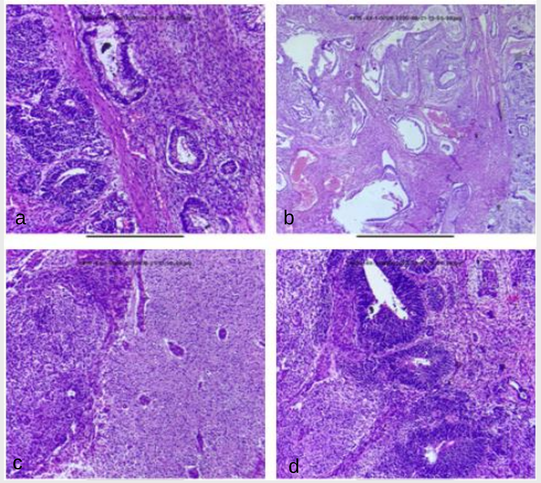


Figure 1. (a,b,c) Cellular smear shows small round cells with coarse chromatin arranged in rosette, sheets, and lying singly with immature glial-like cells in a fibrillary neuropil matrix.(H&E,10x). (d) Smear shows monolayered sheets of bland-looking cuboidal cells. (H&E, × 40x).



DISCUSSION

Cytological detection of IOT components in imprint cytology is rare, thus a meticulous search for various components, i.e. epithelial, glial is of utmost importance for impeccable diagnosis. High serum level of AFP also aids to the diagnosis. Cytological features of IOT as described in literature include cellular smears, small round cells with coarse chromatin, rosettes, glia, and less commonly squamous and glandular elements. YST shows similar age of presentation with elevated serum AFP levels. Neuroectodermal rosette can be confused with cytomorphology of Schiller-Duval bodies. PNET though uncommon in the ovary shows similar cytomorphology[3]. Presence of rosettes, neuropil or endo/ectodermal elements rule out YST & PNETs as primary differentials. As IOT tend to spread past the ovaries, imprint diagnosis of the tumor can help the surgeon to recognize dissemination/ peritoneal implants and cautiously plan the surgery thus improving patient's subsequent clinical course.

CONCLUSIONS

The varied cytomorphology of IOT when considered together are profoundly indicative of the diagnosis and thus increases the sensitivity and specificity in differentiating it from other cytological mimics.

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