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Adult granulosa cell tumour with yolk sac like areas in a young female

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Abstract

Granulosa cell tumour (GST) belongs to the sex-cord/stromal tumours of the gonads. We received slides and blocks for review of a 27 years female whounderwent Right oopherectomy. On microscopic examination, architectural pattern was suggestive of either yolk sac tumor andgranulosa cell tumor. Cellular features were suggestive of Granulosa cell tumor because of presence of nuclear grooves. So we decided to go ahead with immunohistochemistry. We used following IHC markers: Inhibin, Calretinin, EMA (Epithelial Membrane antigen), Glypican and PLAP (Placental alkaline phosphatase). Tumor cells were positive for Inhibin, Calretinin and negative for EMA, Glypican and PLAP. We gave a final diagnosis of adult granulosa cell tumor considering morphological and immunohistochemical findings.

Keywords: Sex cord stromal tumor, Granulosa cell tumor, Adult granulosa cell tumor, Inhibin, Calretinin.

Introduction

Granulosa cell tumour (GST) belongs to the sex-cord/stromal tumours of the gonads.(1) Two forms of GST have been recognized, namely, the typical adult type, and its variation, and the juvenile type. Adult type of granulosa cell tumour usually occurs in post menopausal women(50-55 years) and microscopically shows small, bland, cuboidal to polygonal cells having coffee bean nuclei with folds/ grooves arranged in various patterns, including Call-Exner bodies (small follicle-like structures filled with acidophilic material), macrofollicular, trabecular, solid and insular patterns.(2,3,4,5)

Here we present a case of 27 years female with adult granulosa cell tumour having yolk sac tumour like areas.

Case History

A 27-year-old female underwent Right oopherectomy. We received slides and blocks for review. Microscopic examination showed a tumour composed of cells arranged in following cellular patterns: Microcystic or reticular, Endodermal sinus pattern (Schiller Duval bodies), solid pattern and microfollicular pattern. Cells had scant cytoplasm and pale nuclei, some of which had nuclear grooves.

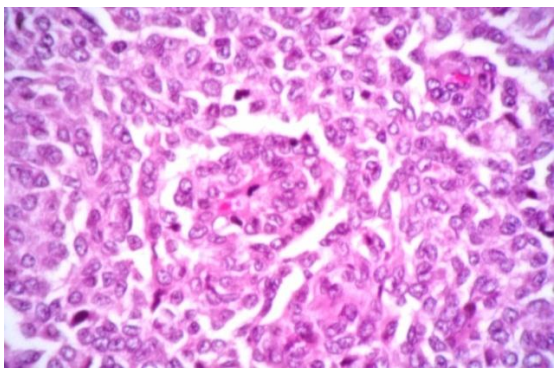

Fig. 1: Schiller Duval body like structures (H and E 40X)

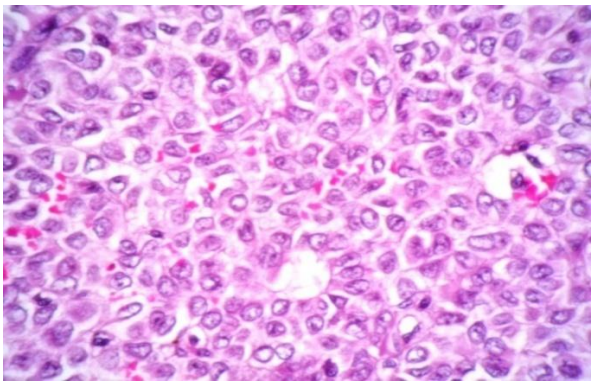

Fig. 2: Microfollicular pattern with some nuclei showing nuclear grooves(H and E 40X)

On microscopic examination, architectural pattern was suggestive of either yolk sac tumor and granulosa cell tumor. Cellular features were suggestive of Granulosa cell tumour because of presence of nuclear grooves. So we decided to go ahead with immunohistochemistry. We used following IHC markers: Inhibin, Calretinin, EMA (Epithelial Membrane antigen), Glypican and PLAP (Placental alkaline phosphatase). Tumor cells were positive for Inhibin, Calretinin and negative for EMA, Glypican and PLAP. We gave a final diagnosis of adult granulosa cell tumor considering morphological and immunohistochemical findings.

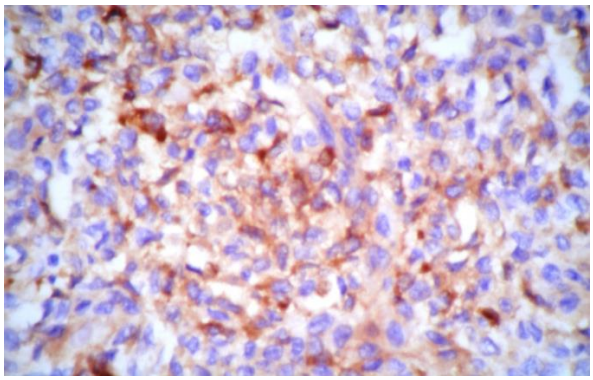

Fig. 3: IHC for Inhibin. Cells are positive for inhibin(40X)

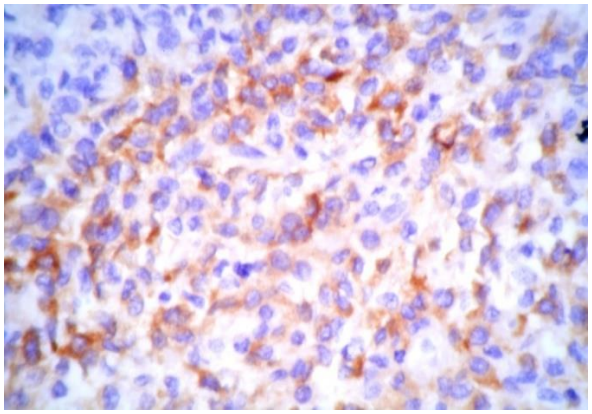

Fig. 4: IHC for Calretinin Cells are positive for calretinin(40X)

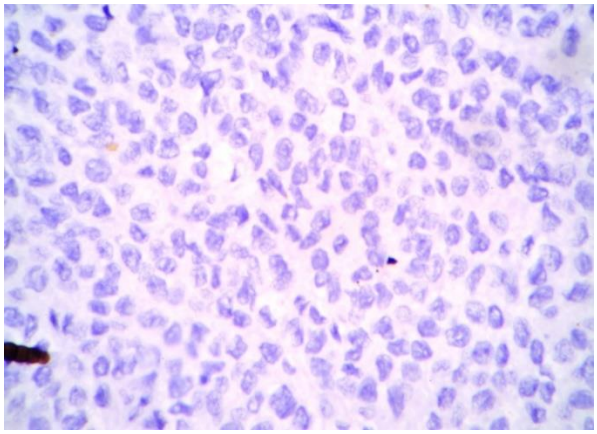

Fig. 5: IHC for EMA. Cells are negative for EMA(40X)

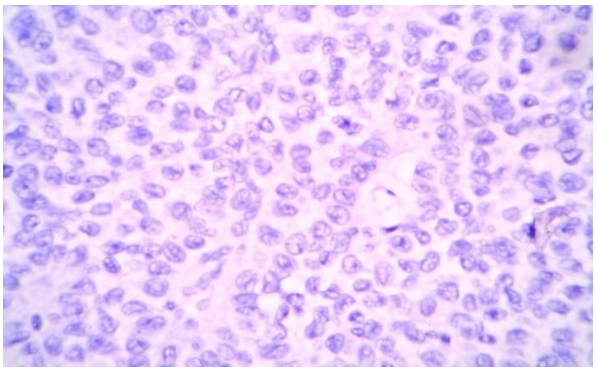

Fig. 6: IHC for Glypican. Cells are negative for glypican in Schiller duval body like areas(40X)

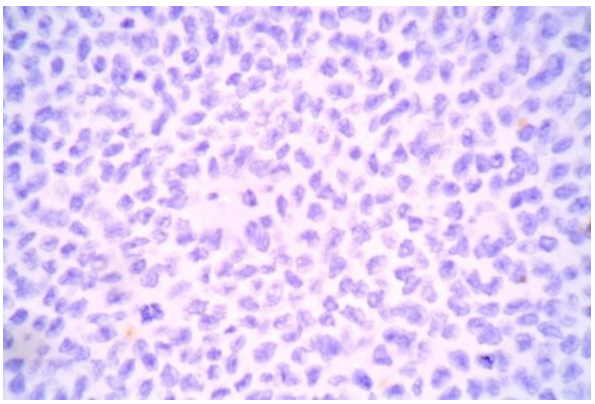

Fig. 7: IHC for PLAP. Cells are negative for PLAP(40X)

Discussion

Granulosa cell tumours predominantly occur in the peri and postmenopausal period with peak prevalence in patients aged 50 to 55 years. The other peak frequency corresponds to the prepubertal age. They are rare in third decade of life.[6]

In our case age of patient was 27 years, which was older for a yolk sac tumor and younger for adult granulosa cell tumor. It is very important to differentiate between sex cord stromal tumour and germ cell tumour. For sex cord stromal tumour usually salpingo-oopherectomy will suffice.[7] For germ cell tumour salpingo-oopherectomy is usually followed by chemotherapy depending upon stage of tumor.[7]

In granulosa cell tumor, cells are arranged in variety of cellular patterns. The rare cellular patterns described in literature are macrofollicular pattern, tubular pattern, papillary pattern etc.[6] In this case of adult granulosa cell tumor, we also observed focal arrangement of tumour cells in form of Schiller duval body like structures. Cellular pattern in form of Schiller duval body like structures have not been previously described in adult granulosa cell tumor.

The commonly used markers for diagnosis of sex cord stromal tumours are inhibin, calretinin, fork head box protein L2 (FOXL2), steroidogenic factor 1(SF-1), WT1, and EMA.

The most helpful triad that currently exists in evaluating sex cord-stromal tumours and their mimics is that of inhibin, calretinin, and epithelial membrane antigen (EMA). The first two are typically positive in sex cord tumours and the third, typically negative.[8]

The commonly used nuclear markers for germ cell tumours include Sal-like protein 4 (SALL4), octamer-binding transcription factor 4 (OCT4), NANOG protein, and SRY (sex-determining region Y)–box 2 (SOX2). SOX2 is also a cytoplasmic marker. The commonly used membranous markers include CD117, D2-40, CD30, PLAP, and Glypican-3. PLAP and Glypican-3 are also cytoplasmic markers. When used in combination with the non–germ cell tumour markers, PLAP and SALL4 reliably separate germ cell tumours from epithelial and gonadal stromal neoplasm in most cases.[9,10,11]

Yolk sac tumours are usually confirmed by diffuse reactivity with SALL4, AFP, and Glypican-3 and negative staining with CK7 and EMA.[12] In our case, tumour cells present in Schiller duval body like pattern were negative for PLAP and Glypican. This helped us in ruling out Yolk Sac tumour. Tumour cells were positive for inhibin and calretinin. This helped us in arriving at a diagnosis of adult granulosa cell tumour.

Conclusion

Adult type of granulosa cell tumour can be rarely seen in young ladies below 30 years. Occasionally these tumours can have schiller duval body like structures which can be confused morphologically with yolk sac tumour. Ancillary techniques like immunohistochemistry is useful in such a situation. Expression of inhibin and calretinin with negative EMA confirms the diagnosis of adult granulosa cell tumour and negative markers like PLAP and Glypican rule out yolk sac tumour.

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