Primary granulosa cell tumor of retroperitoneal origin: A rare presentation with emphasis on cytomorphology

ABSTRACT
The most frequently occurring retroperitoneal tumors are those of the kidneys, adrenal glands, and the pancreas. A primary retroperitoneal tumor composed of granulosa cells and developing far away from the normal location of the ovary is less frequently observed. A 69-year-old female patient presented with abdominal discomfort. Computerized tomography (CT) of the abdomen revealed a solid heterogeneous mass lesion measuring 11.2 cm × 8 cm × 12 cm consistent with retroperitoneal hematoma. Ultrasonography (USG)-guided aspiration smears revealed cytological features suggestive of adult-type granulosa cell tumor (AGCT). As the patient had a history of hysterectomy with bilateral salpingo-oophorectomy 22 years ago for leiomyoma, a diagnosis of extraovarian AGCT was made. Intraoperatively, the tumor was removed in piecemeal that showed yellowish areas with extensive necrosis and hemorrhage. Histopathological examination of the excised mass and inhibit positivity confirmed the diagnosis. Primary retroperitoneal extraovarian GCT is a rare tumor with only 12 cases reported in medical literature in English.

Key words: Adult-type granulosa cell tumor (AGCT); cytological features; extraovarian; histopathology; retroperitoneal

Introduction

The name “granulosa cell tumor” (GCT) was proposed by von Werdt in 1914. Ovarian GCTs are uncommon neoplasms that comprise 2-5% of all ovarian cancers.

The primary extraovarian GCT is an extremely rare tumor. To have primarily originated retroperitoneal GCT is even rarer. In medical literature in English from 1938 till today, only 12 cases have been reported. Although, the histology of ovarian adult-type granulosa cell tumors (AGCTs) is well-documented, it is rarely encountered in cytological specimens and the identification of tumor cells is very difficult. Here, we describe a case of extraovarian AGCT with emphasis on cytologic features.

Case Report

A 69-year-old female presented with abdominal discomfort. Per abdominal examination revealed a well-defined mass palpable in the left hypochondriac and lumbar regions. Computerized tomography (CT) of the abdomen revealed a solid heterogeneous mass lesion measuring 11.2 cm × 8 cm × 12 cm, consistent with retroperitoneal hematoma. Ultrasonography (USG)-guided aspiration of the mass was performed and the smears were hypercellular with small, overlapping cell clusters and cells in a microfollicular pattern. Tumor cells were round to oval, with...
hyperchromatic nuclei containing granular chromatin. Occasional cells showed coffee-bean-like nuclear grooves. Characteristic Call-Exner bodies showing microfollicular structures with amorphous material were not seen. On enquiry, she gave a history of hysterectomy with bilateral salpingo-oophorectomy 22 years ago for uterine leiomyoma. With these cytological features and the clinical history, a diagnosis of extraovarian AGCT was proposed. The patient underwent exploratory laparotomy and the mass lesion was removed in piecemeal. We received multiple dark brown and necrotic tissue fragments together measuring 10 cm × 8 cm × 3 cm. The cut section of all fragments showed gray white, yellowish, and hemorrhagic areas.

Histologically the neoplasm was composed of small round to oval neoplastic cells with predominantly microfollicular [Figure 1c], diffuse, and watered-silk patterns. Characteristic Call-Exner bodies were seen. The cells showed scanty cytoplasm and round to oval nuclei with nuclear groove. Mitotic activity was low. The tumor showed extensive areas of hemorrhage and necrosis. Immunohistochemistry (IHC) for inhibin and epithelial membrane antigen (EMA) was done. The tumor was positive for inhibin [Figure 1d] and negative for EMA. With the typical histopathological features and IHC findings, a diagnosis of primary AGCT of retroperitoneum was confirmed. The patient was prescribed chemotherapy, as the excision was not complete.

**Discussion**

GCTs are uncommon ovarian tumors that comprise 2% of all ovarian cancers.[4] There are two subtypes: adult and juvenile, based on different clinical and histological features.[4] AGCT of the ovary is oftentimes a hormonally active stromal cell neoplasm that is distinguished by its ability to express aromatase and to secrete sex steroids such as estrogen.[5] The histogenetic origin of extraovarian AGCT is thought to be from the ectopic gonadal stromal tissue from the mesonephros.[2]

The cytological smears of an AGCT are usually highly cellular of both single cells, syncytial aggregates, and follicular pattern.[6] The cells are monomorphic with scanty to moderate amount of pale cytoplasm and monomorphic round to oval nuclei having longitudinal grooves and granular chromatin.[6]

Histologically, the tumor cells resemble normal granulosa cells with uniform, round or oval nuclei having finely granular chromatin and longitudinal nuclear grooves or folds.[7] They show microfollicular, macrofollicular, trabecular, watered-silk, or diffuse patterns.[7] Similar cytological and histological features were observed in our case.

Extraovarian GCT should be differentiated from other tumors such as small-cell carcinoma, undifferentiated carcinoma, carcinoids, and lymphoma.[3] Inhibin, calretinin, and EMA immunostains can help in differentiating these tumors.[3] GCT is positive for inhibin and calretinin and negative for EMA whereas other tumors do not show positivity for inhibin and calretinin.[3]

**Conclusion**

The case of primary retroperitoneal GCT is reported for its rarity after excluding previous ovarian origins and to describe its relevance to the histologic origin. Due to their rarity, AGCTs present a diagnostic challenge for cytologic preparations. We believe that sensitive cytologic evaluation, histopathologic correlation, taking clinical history, and a positive immunohistochemical reaction with inhibin could help us in practice. Surgery is the primary treatment for these tumors, however, long-term follow-up with history, clinical examination, and tumor markers are crucial for GCTs, as later relapse is a common behavior for these unique tumors.

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Conflicts of interest
There are no conflicts of interest.

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