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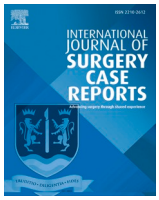

Case report

# A testicular mass found to be a rare testicular adult-type granulosa cell tumor: A case report and literature review

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ABSTRACT

*Introduction and importance:* Granulosa cell tumors (GCTs) are rare tumors, which mostly affect the ovaries. GCTs are classified into two types: juvenile and adult. Adult testicular GCTs are potentially malignant sex cord-stromal tumors.

*Case presentation:* Here, we report a case of a 63-year-old man who presented with a right testicular nodule. Testicular ultrasound showed a hypoechoic tissue mass, measuring 3 cm and hyper vascularized in the color Doppler. A radical orchidectomy was performed. Histology showed a typical adult-type Granulosa cell tumor. After 12 months follow up, the patient is doing well and disease-free.

*Clinical discussion:* According to our case and a review of the literature, this type of tumor is an uncommon and slow-growing neoplasm. The diagnosis is confirmed by histology, treatment is based on surgery, radical orchidectomy. Long-term follow-up of patients is essential because distant metastases may emerge late in the clinical course.

*Conclusion:* This case report adds valuable insights to the limited literature on adult testicular Granulosa cell tumors. Radical orchidectomy remains the optimal treatment, and early diagnosis, coupled with surgery, significantly enhances prognosis.

## 1. Introduction

Granulosa cell tumor (GCT) is a gonad sex cord-stromal neoplasm that most commonly affects the ovaries but can also affect the testes in rare cases [1]. GCTs are divided into two categories: juvenile and adult [2]. The juvenile type commonly concerns the first six months of life [3]. The adult type is very rare and can affect people of all ages, with an average age of 42 years [4]. In 1952, Laskowski reported the first case of adult GCT in a 20-year-old male [5]. The adult-type granulosa cell tumor of the testis (AGCTT) is presented clinically as a slow, painless enlargement over a variable period of time [6]. Erectile dysfunction, gynecomastia, and decreased libido may also be present [6]. Most of the adult-type GCTs seem to be benign and slow growing [7]. Nevertheless, this tumor has the potential to form distant metastases [7]. Patients who present with distant metastases generally have a poor prognosis [7]. The initial management of the adult-type GCTs is radical orchidectomy [4]. However, due to the lack of consensus, the optimal approach for adjuvant therapy in treating metastatic testicular GCTs, whether through chemotherapy or radiotherapy, remains unclear [7]. GCT is an extremely rare tumor, and, to date, only a small number of cases have been reported.

In this case report based on SCARE 2023 guidelines for better reporting [8], we report a case of an adult-type granulosa cell tumor affecting the testis of an adult male.

## 2. Case report

A 63-year-old man presented with a right testicular mass that had been persisting for the past 6 months and had shown a significant increase in size over time. He did not have any other complaints, and he denied experiencing any genitourinary symptoms or trauma. The patient was previously diagnosed with papillary carcinoma of the right kidney, for which he underwent a right nephroureterectomy. Following the surgery, he received adjuvant therapy with Sunitinib, administered at

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50 mg PO once a day for 4 weeks, followed by a 2-week off period, for a total duration of one year.

The clinical examination revealed a hard, painless, 3 cm thick swelling. The patient had no lymphadenopathy, gynecomastia, or abdominal mass. Tumor markers were negative, with LDH at 214 IU/l, beta-HCG <2, and alpha-fetoprotein at 0.5 IU/ml. Testicular ultrasound (Fig. 1) showed a hypoechoic tissue mass, measuring 3 cm and hyper vascularized in the color Doppler. The thoracic-abdominal-pelvic CT scan showed a right testicular lesion with irregular contours, enhanced after injection of the contrast medium, and did not demonstrate any evidence for metastatic disease.

A radical inguinal orchidectomy was performed for pathological diagnosis, and no post-surgical complications were observed in the aftermath of the surgery. Careful examination (Fig. 2) revealed a testicle measuring 4.0/6.0 cm and weighing 50.0 g. On sectioning, we noted a whitish nodule measuring 3 cm in length. The spermatic cord measured 7.0 cm. There was no necrosis, no hemorrhage, and no infiltration of the adjacent parenchyma. The histological (Fig. 3) examination revealed an undifferentiated tumor. The cytoplasm was sparse. No invasion of the epididymis, rete testis, albuginea, or spermatic cord was seen. There was no intra-lobular neoplasia or vascular emboli. The intersecting testicular cord was intact. The immunohistochemical analysis finds positive staining of tumor cells by Calretinin A, anti-Vimentin antibodies, anti-AE1/AE3 antibodies, anti-CD56 antibodies, and anti-INI1 antibodies. Negative staining of OCT3/4 antibodies. The diagnosis retained was an adult-type of testicular granulosa cell tumor. The 1-year postoperative surveillance, including CT and clinical examinations every 3 months, has been unremarkable. Our patient is still alive at the time of writing this case report. On the other hand, our patient was satisfied with our management.

## 3. Discussion

Adult granulosa cell tumors (GCTs) are considered to be uncommon, with only 74 cases previously reported in the medical literature [9,4].

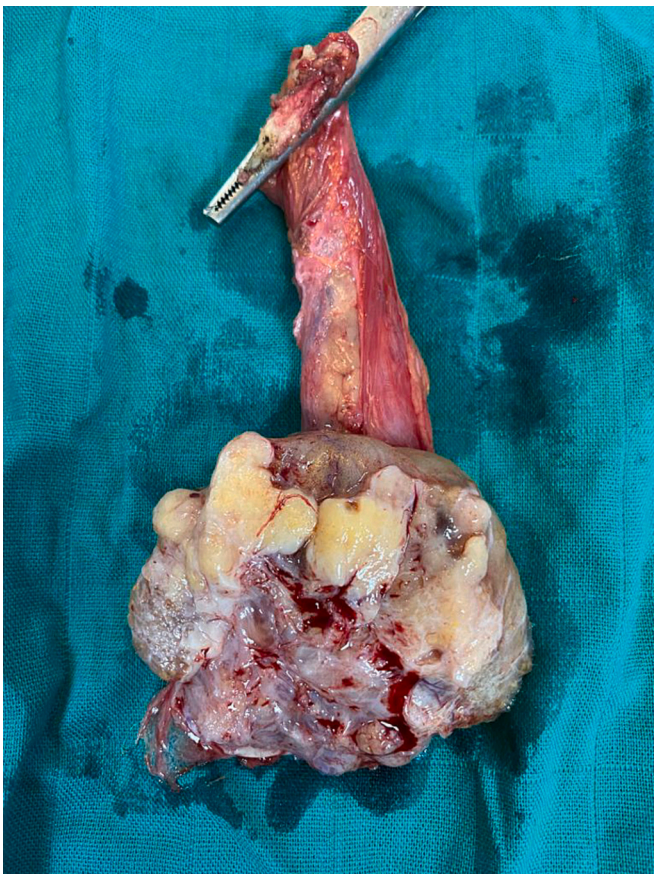

**Fig. 2.** Orchiectomy specimen: Testicle measuring 4.0/6.0 cm and weighing 50.0 g.

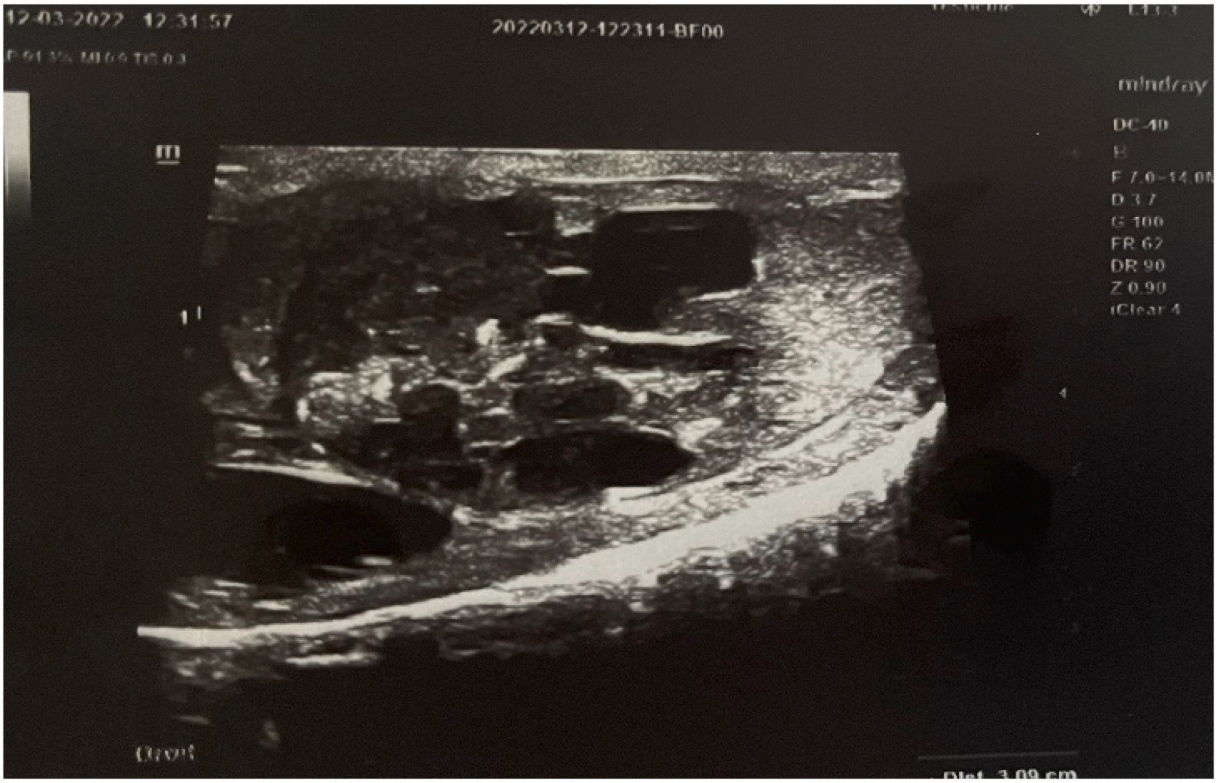


**Fig. 1.** Representative ultrasound images of the testicular mass.

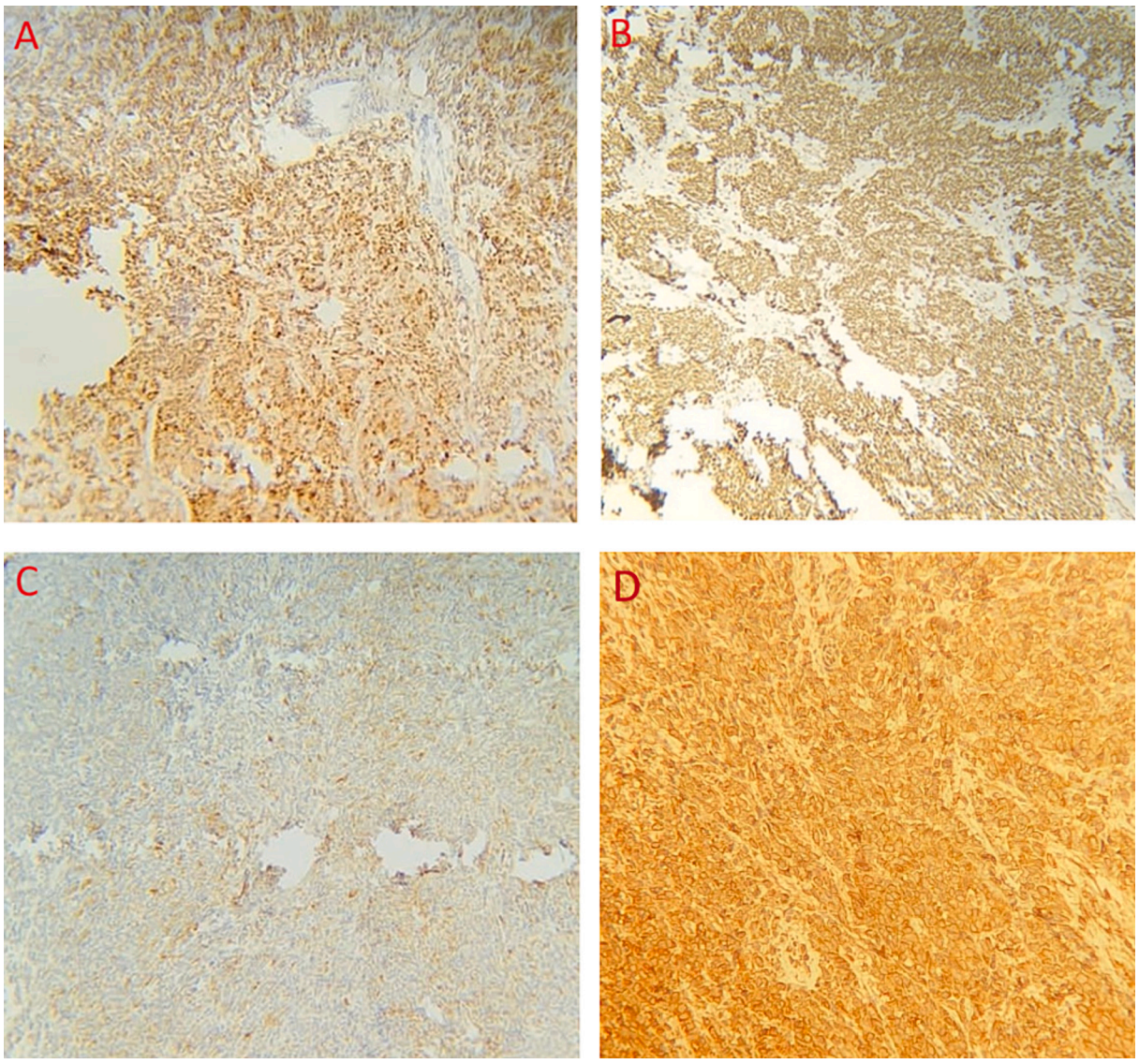


**Fig. 3.** Immunohistochemical staining reveals diffuse strong positivity for calretinin A (A), anti INI 1 (B), anti AE 1/AE3 (C), anti-Vimentin (D).

However, the actual number of cases is likely to be higher than reported, as many cases go unreported. Here, we present a case of a 63-year-old man with an adult-type GCT in his right testis.

Based on histological findings, granulosa cell tumors represent 2 % of all ovarian tumors [10]. Within the ovary, the adult type is more prevalent, comprising 95 % of cases [3]. In contrast, according to a systemic review published by Grogg JB, et al. in 2020 [4], the majority of reported cases of testicular GCTs (166/239, 69 %) are of the juvenile type, with only 73 (31 %) being of the adult type [4]. The occurrence of GCTs in adults is infrequent and has only been reported in small case series and case reports [4]. Similar to the adult type, juvenile granulosa cell tumor is a highly uncommon condition. However, it is considered one of the more frequent congenital testicular tumors [11]. The adult type can appear at any age after puberty, whereas the juvenile type appears in the first 6 months of life [1,12,13].

Adult testicular GCTs mostly affect white men and present as a pain-free mass in the testis, usually with no other associated signs. Some patients may develop gynecomastia because of hormonals abnormalities such as estrogen hypersecretion, or chromosomal abnormalities [14].

Diagnosis depends on histology. Adult granulosa cell tumors are composed of small cells in which the nuclei are pale, often showing grooves. The majority are growing on a fibrocollagenous or oedematous background organized as sheets, microfollicles, nests, and cords, while juvenile granulosa cell tumors usually come with solid and follicular patterns where the nuclei are immature [1].

Adult testicular GCT can be diagnosed using immunohistochemistry [4]. Granulosa cell tumors express inhibin, vimentin, and calretinin, but not epithelial membrane antigen (EMA), placental alkaline phosphatase or synaptophysin [6,9]. CD56 is a specific and useful immunohistochemical marker for ovarian sex cord-stromal tumors [15], whereas it has been expressed in only one case of adult testicular GCT [9]. The tumor in our case was diffusely positive for Calretinin A, anti-Vimentin antibodies, anti-AE1/AE3 antibodies, anti-CD56 antibodies, and anti-INI1 antibodies.

In terms of prognosis, juvenile testicular GCTs are usually benign [16], while adult type has metastatic potential [7]. Approximately 20 % of adult testicular GCTs exhibit malignant behavior [7]. There is currently a lack of well-defined histological, pathological, or clinical criteria to predict whether TGCTs are malignant or benign. However, studies suggest that the size of the tumor, specifically if it is larger than 5 cm, may be positively associated with the malignancy of adult-type TGCTs, while other factors such as mitotic count and tumor necrosis do not seem to be reliable predictors [6]. Male metastases most commonly occur in the retroperitoneal lymph nodes, liver, bones, and

lungs [7,17,18]. Despite the studies mentioned earlier, the behavior and prognosis of testicular adult-type granulosa cell tumors remain unclear due to the limited number of reported cases. Our patient was followed-up closely, but has remained free of disease one year post-surgery.

Due to its rarity, the prognosis for patients with malignant GCTs is variable and not well defined. In a literature review conducted by Hammerich et al., it was found that patients with distant or multiple metastases, progressed quickly and had limited overall survival [7]. On the other hand, patients with metastasis limited to the retroperitoneal lymph nodes tended to have a longer survival period [7]. To provide more conclusive prognoses for patients with metastatic GCTs, it is imperative to have larger sample sizes and longer follow-up periods.

The initial management of the cases in the systematic review [4] is radical orchidectomy. In some cases with lymph node metastasis, retroperitoneal lymph node dissection (RPLND) is performed [18]. However, RPLND is only effective in the early stages of the disease and not in later stages where lymph nodes are already involved [19]. Due to the lack of consensus, the optimal approach for adjuvant therapy in treating metastatic testicular GCTs, whether through chemotherapy or radiotherapy, remains unclear [7]. Nonetheless, post-operative administration of drugs such as bleomycin, etoposide, and cisplatin has been reported in several cases [7,14]. The use of etoposide-based chemotherapy with adjuvant radiotherapy could potentially provide a cure for advanced cases of testicular GCTs [18]. Furthermore, a case report demonstrated that an advanced testicular granulosa cell tumor partially responded to Pazopanib, an angiogenesis inhibitor, after showing resistance to initial cytotoxic chemotherapy [20]. Radical orchidectomy was sufficient in our case as there was no evidence of local or distant metastases.

## 4. Conclusion

Adult testicular granulosa cell tumor is a rare and complicated tumor in terms of prognosis and management. Surgical resection is often sufficient and it is usually curative. However, there is a lack of consensus on the appropriate regimen for metastatic cases. To our knowledge, only 74 cases of this tumor have been reported in the literature to date. Our report includes an additional case of this tumor, that has been treated with a radical orchidectomy. We need a sufficient number of cases for long-term follow-up to further improve the worldwide management of the GCT.

## Consent to participate

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

## Ethical approval

Ethical approval has been exempted by our institution.

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None.

## Guarantor

Rezzoug Fatima.

## CRediT authorship contribution statement

Fatima Rezzoug: writing, review and editing of the manuscript.
Hind Chibani: have helped writing the article, data collection.
Soufia El Ouardani: have helped collecting data.
Ouissam Al Jarroudi: supervised the writing of manuscript.
Sami Aziz Brahmi: supervised the writing of manuscript.
Said Afqir: supervision and data validation.

## Declaration of competing interest

The authors have no conflict of interest to declare.

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