

A Testicular Masquerader: Sertoli Cell Tumour (Not Otherwise Specified) of the Testis Mimicking Seminoma in an Adult Male: A Case Report

Running title: Sertoli Cell Tumour Mimicking Seminoma

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ABSTRACT

Background: Sertoli cell tumour (SCT) of the testis is a rare sex cord-stromal neoplasm, accounting for less than 1% of all testicular tumours. Because SCTs are usually clinically silent and radiologically indistinguishable from germ cell tumours, they are frequently misdiagnosed as seminoma preoperatively, and histopathological examination remains the definitive diagnostic standard.

Case Presentation: A 54-year-old male presented with a slowly progressive, painless left scrotal swelling of five years' duration following a remote scrotal injury. Local examination revealed an 8 × 4 cm left testicular swelling with a positive transillumination test. Serum tumour markers (β-human chorionic gonadotropin and alpha-fetoprotein) were within normal limits; lactate dehydrogenase was mildly elevated. Scrotal ultrasonography showed a heterogeneous hypoechoic intratesticular lesion with increased vascularity and an associated hydrocele, suggestive of a testicular neoplasm. A clinical diagnosis of seminoma was made, and the patient underwent left radical inguinal orchidectomy with herniorrhaphy. Histopathological examination revealed a well-circumscribed, encapsulated grey-yellow tumour composed of cells with round, fine-chromatin nuclei arranged in nests and tubules separated by fibrous septa, with neither necrosis, lymphovascular invasion, nor significant nuclear atypia. A final diagnosis of Sertoli cell tumour, not otherwise specified, pT1b, was rendered.

Conclusion: This case underscores the importance of maintaining a high index of suspicion for Sertoli cell tumour among testicular masses that mimic seminoma and highlights histopathology, supplemented by immunohistochemistry when needed, as the diagnostic gold standard. Because SCT carries a small but definite risk of malignant behaviour, long-term clinical and radiological surveillance is warranted even when initial histology appears benign.

Keywords: Sertoli cell tumour; sex cord-stromal tumour; testicular neoplasm; seminoma; orchidectomy

1. INTRODUCTION

Testicular neoplasms are broadly divided into germ cell tumours, which account for more than 90–95% of cases, and non-germ cell (sex cord-stromal) tumours, which are considerably rarer.¹ Among sex cord-stromal tumours, Sertoli cell tumour (SCT), not otherwise specified (NOS), is the most common

subtype, yet it still accounts for less than 1% of all testicular neoplasms. SCT arises from the Sertoli cells lining the seminiferous tubules and typically presents in adults between the third and sixth decades of life as a slowly enlarging, painless testicular mass.^{2,3}

Serum tumour markers used for germ cell tumours (alpha-fetoprotein, β-human chorionic gonadotropin)

are typically normal in SCT, and no radiological feature reliably distinguishes SCT from seminoma or other germ cell tumours on ultrasonography.^{2,4} Consequently, most SCTs are diagnosed clinically and radiologically as seminoma or another germ cell tumour, and the correct diagnosis is established only after orchidectomy and histopathological examination, occasionally supported by immunohistochemistry.⁴ Most SCTs pursue a benign clinical course, but 10–12% behave in a malignant fashion, with metastasis most often to retroperitoneal lymph nodes.² Recognised histological predictors of malignancy include tumour size greater than 5 cm, lymphovascular invasion, a high mitotic index, tumour necrosis, and marked nuclear atypia.^{3,4} We report a case of SCT NOS in a 54-year-old man who presented with a longstanding scrotal swelling and was managed clinically as seminoma prior to histopathological clarification of the diagnosis, illustrating both the diagnostic pitfalls and the favourable prognostic features associated with this tumour.

2. Case Presentation

2.1 History

A 54-year-old male presented with a left scrotal swelling of five years' duration. He gave a history of sustaining a scrotal injury around the time of onset of the swelling, which was insidious in onset and gradually progressive, without associated pain or any aggravating or relieving factors. There was no history of fever, chills, external injuries, weight loss, or backache. His past medical history was notable for type 2 diabetes mellitus and hypertension on treatment, percutaneous coronary intervention to the right coronary artery two years previously, and severe left ventricular dysfunction (ejection fraction 30%). He was a chronic smoker of 10 years' duration and consumed alcohol for 15 years. His personal history, including diet, appetite, bowel and bladder habits, were otherwise unremarkable.

2.2 Examination

General physical examination revealed a moderately built, elderly male, conscious and well oriented, without pallor, icterus, cyanosis, clubbing, or lymphadenopathy. Bilateral lower-limb oedema was present. Vital parameters were stable (pulse rate 80 beats/min, blood pressure 110/70 mmHg, SpO₂ 98% on room air, afebrile). Systemic examination, including respiratory, cardiovascular, neurological, and abdominal systems, was unremarkable.

Local examination revealed a left testicular swelling measuring approximately 8 × 4 cm; the examiner could get above the swelling, and the transillumination test was positive. On inspection, the penis was normal, and the scrotum was asymmetrically enlarged by the swelling without overlying skin changes. On palpation, there was a local rise of temperature over the scrotum but no tenderness; the epididymis and spermatic cord were normal, favouring a primary testicular rather than epididymal or paratesticular process.

2.3 Investigations

Complete blood count and coagulation profile were within normal limits, and serological testing was negative. Urine routine examination showed glycosuria (2+), and random blood sugar was elevated at 237 mg/dL. Serum tumour markers showed β -human chorionic gonadotropin < 0.2 mIU/mL (normal), alpha-fetoprotein 3.8 ng/mL (normal), and lactate dehydrogenase mildly elevated at 338 U/L (Table 1).

Ultrasonography of the abdomen and pelvis showed no significant abnormality. Scrotal ultrasonography with colour Doppler demonstrated a well-defined, heterogeneous, hypoechoic lesion in the left testis measuring 46 × 35 × 28 mm with increased internal vascularity, suggestive of a neoplastic aetiology, and an associated left hydrocele of approximately 14 cc (Figure 1).

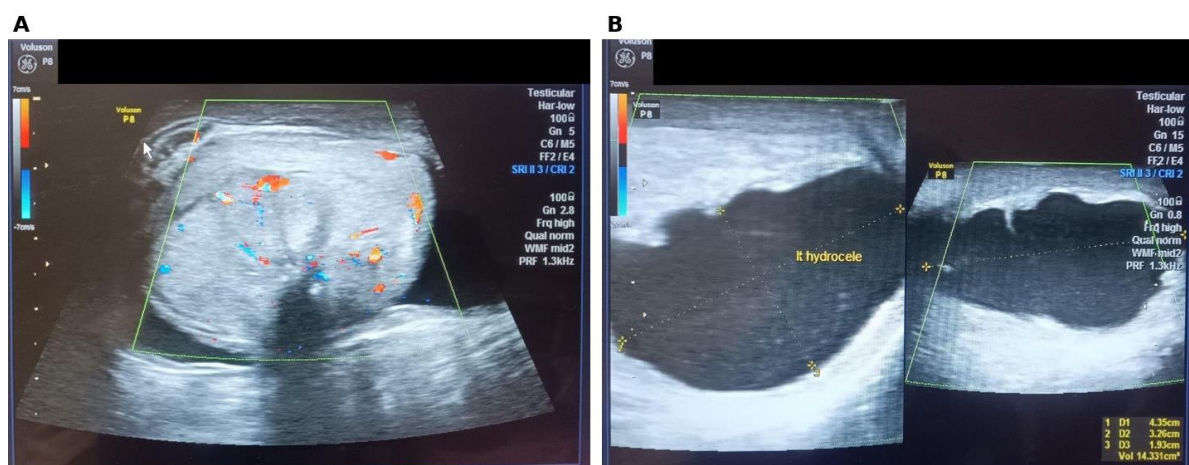


Figure 1. Grayscale and colour Doppler scrotal ultrasonography. (A) Well-defined, heterogeneous, hypoechoic lesion in the left testis with increased internal vascularity on colour Doppler, suggestive of a neoplastic aetiology. (B) Associated left-sided hydrocele (fluid collection approximately 14 cc). Patient-identifying information has been redacted from both images.

2.4 Diagnosis and Management

Based on the clinical and radiological findings, a provisional diagnosis of seminoma of the left testis was made, and the patient underwent left radical (high) inguinal orchidectomy with left herniorrhaphy. The specimen was submitted for histopathological examination.

2.5 Pathological Findings

Gross Examination: The orchidectomy specimen, with attached spermatic cord, measured $13.5 \times 4.5 \times 3.5$ cm, with a 7 cm length of cord. The testis measured $5.5 \times 4.5 \times 3$ cm, and a discrete intratesticular tumour measured $3.5 \times 3 \times 3$ cm. The external surface was smooth. The cut surface showed a well-demarcated, homogeneous, lobulated, grey-yellow mass with an intact capsule, compressing the adjacent normal testicular parenchyma (Figure 2).



Figure 2. Gross pathology of the orchidectomy specimen. (A) External surface of the specimen with attached spermatic cord, showing a smooth external surface and compressed residual normal testicular parenchyma. (B) Cut surface showing a well-demarcated, homogeneous, lobulated, grey-yellow tumour with an intact capsule, distinct from the adjacent compressed normal testis.

Microscopic Examination: Sections showed a tumour composed of cells arranged in nests and tubules separated by fibrous septa. Individual tumour cells had round nuclei with fine chromatin and a moderate amount of eosinophilic cytoplasm. There was no evidence of necrosis, lymphovascular invasion, or significant nuclear atypia (Figure 3).

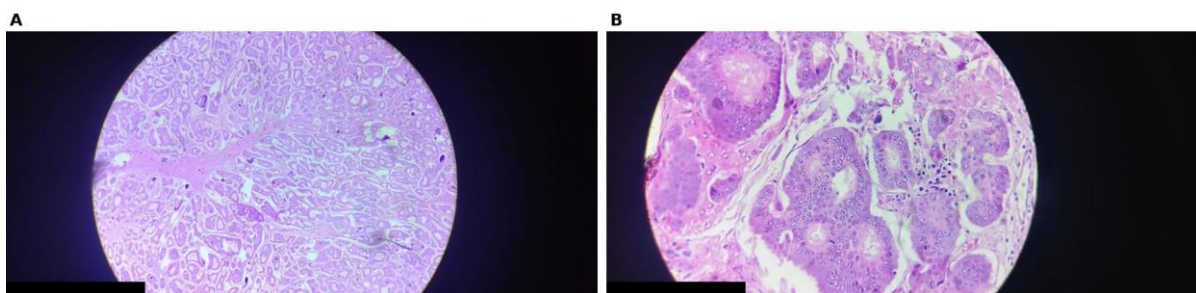


Figure 3. Photomicrographs of the tumour (haematoxylin and eosin). (A) Low-power view showing a lobulated tumour with fibrous septa separating nests and tubules of tumour cells. (B) High-power view showing tumour cells with round nuclei, fine chromatin, and moderate eosinophilic cytoplasm, arranged in nests and tubules without necrosis or significant nuclear atypia.

Final impression: Sertoli cell tumour, not otherwise specified, left testis, well differentiated, tumour size $3.5 \times 3 \times 3$ cm, confined to the testis, with clear resection margins and normal spermatic cord and epididymis. On the basis of tumour size and the absence of lymphovascular invasion, the tumour was staged as pT1b using the anatomic testicular

pT categories of the 8th edition American Joint Committee on Cancer (AJCC) staging system, extrapolated to sex cord-stromal tumours in the absence of a dedicated staging system for these neoplasms, as reported in the largest outcome series of SCT.^{2,7} Regional nodes were not submitted (pNx), and there was no clinical or radiological evidence of distant metastasis (cM0).

Table 1. Laboratory and tumour marker findings

Parameter	Patient value	Reference range
β-human chorionic gonadotropin	< 0.2 mIU/mL	< 5 mIU/mL (male)
Alpha-fetoprotein	3.8 ng/mL	< 10 ng/mL
Lactate dehydrogenase	338 U/L (↑)	140–280 U/L (lab-dependent)
Random blood sugar	237 mg/dL (↑)	< 140 mg/dL (random, non-diabetic)

Table 2. Morphological variants of Sertoli cell tumour

Feature	Classic SCT (NOS)	Large Cell Calcifying SCT (LCCSCT)	Sclerosing SCT
Frequency	Most common variant	Rare	Very rare
Typical age group	Adults (30–60 yr)	Children / young adults	Young adults
Syndromic association	Usually sporadic	Peutz-Jeghers syndrome, Carney complex	None established
Biological behaviour	Mostly benign (~10–12% malignant)	Usually benign (10–20% malignant)	Almost always benign
Typical ultrasonography	Hypoechoic intratesticular mass	May show calcification	Small, solid, well-defined lesion
Standard treatment	Radical inguinal orchidectomy	Orchidectomy ± syndrome evaluation	Orchidectomy

Adapted from published morphological and clinical descriptions of Sertoli cell tumour variants.^{1,5}

3. Outcome and Follow-Up

The patient had an uneventful postoperative recovery. Given the well-differentiated histology, the absence of adverse histological features (necrosis, lymphovascular invasion, marked atypia), and a tumour size below the 5 cm threshold associated with aggressive behaviour, the tumour was considered to carry a low risk of malignant behaviour.^{2,3} Nonetheless, because a small proportion of histologically bland SCTs can recur or metastasize late, the patient was planned for clinical and sonographic surveillance of the contralateral testis and locoregional nodal basins every six months for the first two years, with cross-sectional imaging of the abdomen reserved for any clinical or sonographic concern, in line with follow-up strategies described for rare testicular sex cord-stromal tumours.²

4. DISCUSSION

Sertoli cell tumour (SCT), not otherwise specified, is a rare sex cord-stromal neoplasm of the testis arising from Sertoli cells of the seminiferous tubules, and accounts for less than 1% of testicular tumours; it most commonly affects adults between 30 and 60 years of

age.^{1,2,3} A large systematic review and meta-analysis of 435 patients found that most SCTs pursue a benign course, but approximately 12% present with or develop metastatic disease, most frequently to retroperitoneal lymph nodes (76% of metastatic cases), followed by the lungs (36%) and bone (16%).²

The exact aetiology of SCT is not well established; most cases, as in the present patient, are sporadic. A minority of SCTs, particularly the large cell calcifying variant, are associated with hereditary tumour predisposition syndromes, including Peutz-Jeghers syndrome (STK11 mutation) and Carney complex (PRKAR1A mutation); these syndromic tumours are more often bilateral, multifocal, and occur at a younger age than the classic NOS variant seen in this patient.^{5,6} Approximately one-third of SCTs are hormonally active and produce oestrogen, which may manifest clinically as gynaecomastia; our patient had no endocrine manifestations, consistent with a sporadic, non-functioning tumour.^{2,5}

Clinically, SCT typically presents with a painless, slowly enlarging testicular mass and normal serum tumour markers, which was also seen in this case.² On

ultrasonography, SCTs are usually well-defined and hypoechoic, may show heterogeneous echotexture with variable vascularity, and an associated hydrocele, as seen here, is occasionally reported.^{1,2} None of these features reliably distinguishes SCT from seminoma or other germ cell tumours, and this diagnostic overlap is well recognised: in one of the largest reported series of malignant SCT, 10 of 13 tumours had been submitted with an initial diagnosis of seminoma, underscoring the tumour's propensity to clinically and microscopically "masquerade" as a germ cell neoplasm.⁴ The nested, glycogen-rich growth pattern of SCT and its prominent nucleoli can closely resemble seminoma on light microscopy, and immunohistochemistry (inhibin, calretinin, and other sex cord markers, with negative germ cell markers) remains the diagnostic gold standard whenever morphology is equivocal.^{1,4}

The World Health Organization classifies SCT into three morphological variants: classic SCT (NOS), large cell calcifying SCT, and sclerosing SCT (Table 2).¹ The classic NOS variant, seen in this patient, is the most frequent, occurs predominantly in adults, and is usually sporadic; large cell calcifying SCT occurs more often in children and young adults and carries the strongest syndromic associations; sclerosing SCT is the rarest variant and behaves in an almost uniformly benign fashion.^{1,5} Histological features associated with malignant potential in SCT NOS include tumour size greater than 5 cm, extratesticular extension, lymphovascular invasion, tumour necrosis, high-grade nuclear atypia, and a mitotic index greater than 5 per 10 high-power fields; two or more such features are present in most reported metastatic cases.^{3,4} The present tumour lacked all of these adverse features and measured well under the 5 cm threshold, supporting a favourable prognosis.

Radical inguinal orchidectomy remains the standard treatment for a testicular mass suspected to be a germ cell tumour or an SCT with any adverse feature; testis-sparing surgery has been described for small, radiologically indeterminate lesions when frozen-section or imaging findings favour a benign sex cord-stromal tumour, as reported in a recent case of SCT managed with testicular preservation.⁸ In our patient, the clinical and radiological impression of seminoma justified radical orchidectomy, which also proved therapeutic once the final diagnosis of a low-risk SCT was established. Because a subset of histologically benign-appearing SCTs can recur or metastasize after a prolonged interval, structured long-term follow-up, incorporating periodic clinical examination and ultrasonography of the contralateral testis, is recommended even for tumours without adverse histological features.²

5. Strengths

This case highlights the diagnostic challenge of distinguishing Sertoli cell tumour, not otherwise

specified, from seminoma based on clinical and radiological findings. The detailed gross and microscopic descriptions emphasize the importance of histopathological examination in establishing the correct diagnosis.

6. Limitations

Immunohistochemical findings were not reported, which limits the documentation of ancillary diagnostic confirmation. Additionally, long-term follow-up data were not available to establish the clinical outcome and exclude late recurrence or metastasis.

7. Future Directions

Further studies involving larger case series are needed to better characterize the clinicopathological features and malignant potential of Sertoli cell tumours. Long-term follow-up and appropriate immunohistochemical evaluation may help improve diagnostic accuracy, risk stratification, and surveillance strategies.

8. CONCLUSION

Sertoli cell tumour is an uncommon sex cord-stromal neoplasm of the testis that frequently mimics seminoma on clinical and radiological grounds, and histopathology, supported by immunohistochemistry when needed, remains the diagnostic gold standard. In the present case, the absence of adverse histological features and a tumour size under 5 cm indicated a low-risk lesion; nonetheless, the small but real potential for late metastasis warrants continued long-term surveillance. Awareness of this entity among urologists, radiologists, and pathologists is essential to ensure appropriate management and follow-up of patients presenting with testicular masses.

9. Declarations

Patient Consent: Written informed consent was obtained from the patient for publication of this case report and the accompanying clinical, radiological, and histopathological images. [Authors: please retain the signed consent form on file as required by the target journal.]

Ethical Approval: [Authors: please insert institutional ethics committee approval/exemption details as required by the submitting institution and target journal.]

Conflict of Interest: The authors declare no conflict of interest.

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Author Contributions: Dr. Navyashree S: clinical management, data acquisition, manuscript drafting; Dr. Anuja Dasgupta, Dr. Akhila J, Dr. Pranita Singh: data acquisition and manuscript review; Dr. Shilpa S Biradar: supervision and critical revision; Dr. C. S. B. R. Prasad: guidance and critical revision. All authors read and approved the final manuscript.

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