



(CASE REPORT)



POSTPUBERTAL TESTICULAR TERATOMA IN AN ADOLESCENT MALE PRESENTING AS A LONG-STANDING STABLE SCROTAL MASS: A CASE REPORT AND LITERATURE REVIEW

Hadayat Ullah ¹, Raheela Haroon ², Abdul Mohaimin Muhammad ³, Faheem Ullah Khan ⁴, Amin Badshah ⁵, Hajra Aziz Yousafzai ⁶, Muneeb Iqbal ⁷, Amir Sohail ⁸, Asad Riaz ^{9,*} and Rahmatullah ¹⁰

¹ Department of Surgery, Mayo University Hospital (MUH), Castlebar, Ireland.

² Department of Surgery, Saidu Teaching Hospital (STH), Swat, Pakistan.

³ Department of Oncology, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Peshawar, Pakistan

⁴ Department of Surgery, Khyber Teaching Hospital (KTH), Peshawar, Pakistan.

⁵ Department of Medicine, Northwest General Hospital & Research Centre, Peshawar, Pakistan.

⁶ Department of Medicine, Ayub Teaching Hospital (ATH), Abbottabad, Pakistan.

⁷ Department of Medicine, Alkhidmat Hospital, Peshawar, Pakistan.

⁸ Department of Surgery, Ayub Teaching Hospital (ATH), Abbottabad, Pakistan.

⁹ Department of Urology, Institute of Kidney Diseases (IKD), Peshawar, Pakistan.

¹⁰ Department of Urology, Institute of Kidney Diseases (IKD), Peshawar, Pakistan.

* Corresponding Author Email: Asadriaz19@gmail.com

ORCID Details

Hadayat Ullah: <https://orcid.org/0009-0005-0441-7633>

Raheela Haroon: <https://orcid.org/0009-0004-8733-8051>

Abdul Mohaimin Muhammad: <https://orcid.org/0009-0003-3612-411X>

Faheem Ullah Khan: <https://orcid.org/0009-0003-0333-8605>

Amin Badshah: <https://orcid.org/0002-0002-7438-3991>

Hajra Aziz Yousafzai: <https://orcid.org/0009-0007-5359-9458>

Muneeb Iqbal: <https://orcid.org/0009-0009-4280-9792>

Amir Sohail: <https://orcid.org/0009-0000-7853-297X>

Asad Riaz: <https://orcid.org/0000-0002-3765-7335>

Rahmatullah: <https://orcid.org/0009-0006-8945-8887>

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ABSTRACT

Background: Testicular teratomas are uncommon germ cell tumours with distinct biological behaviour depending on patient age. In prepubertal males, teratomas are generally benign, whereas in postpubertal males they are regarded as malignant or potentially malignant regardless of histologic maturity. Their presentation as a long-standing stable testicular mass since childhood may create diagnostic uncertainty.

Case Presentation: A 16-year-old male presented with a hard, non-tender left testicular mass that had been present since childhood without significant increase in size. There were no constitutional symptoms or local inflammatory changes. Scrotal ultrasonography demonstrated a well-defined cystic lesion with internal septations and no internal vascularity. Contrast-enhanced CT of the thorax, abdomen, and pelvis showed a heterogeneous left scrotal lesion containing fat, soft tissue, and cystic components, favouring a mature cystic teratoma, along with sub-centimetre para-aortic lymph nodes and an indeterminate 4 mm pulmonary nodule. Serum tumour markers (AFP, β -hCG, LDH) were normal. The patient underwent left radical inguinal orchidectomy. Histopathology confirmed a 35 mm pure teratoma composed of cartilage, skin with adnexal structures, and respiratory epithelium, completely excised, confined to the testis, with no intratubular germ cell neoplasia and negative spermatic cord margin.

Conclusion: This case highlights the importance of managing any intratesticular mass in an adolescent/postpubertal male as malignant until proven otherwise, even when the lesion is long-standing and radiologically suggestive of mature teratoma. Radical inguinal orchidectomy remains the standard diagnostic and therapeutic approach. Histopathological distinction between prepubertal-type and postpubertal teratoma has important prognostic implications, and close surveillance is warranted.

Keywords: Testicular Teratoma, Adolescent, Postpubertal Teratoma, Orchidectomy, Germ Cell Tumour, Case Report

1 INTRODUCTION

Teratomas of the testis are rare nonseminomatous germ cell tumours (NSGCTs) composed of somatic tissues derived from more than one germ cell layer. They exhibit age-dependent biological behaviour. In prepubertal males, testicular teratomas are generally benign and not usually associated with germ cell neoplasia in situ (GCNIS). In contrast, in postpubertal males, all testicular teratomas are considered to possess malignant potential, even when they are histologically mature and apparently well circumscribed [1–4].

Postpubertal testicular teratoma may occur as a pure tumour or as a component of mixed germ cell tumours. It is clinically significant because of its potential for metastasis, chemoresistance of metastatic mature teratomatous elements, and risk of malignant transformation into somatic-type malignancy [2,5]. Imaging may suggest the diagnosis when cystic, fatty, calcified, or heterogeneous elements are present, but definitive diagnosis requires histopathological examination following inguinal orchidectomy [6,7].

We report a case of pure postpubertal testicular teratoma in a 16-year-old male with a long-standing stable testicular swelling since childhood, and review the relevant literature concerning epidemiology, pathology, imaging, management, and follow-up.

2 CASE PRESENTATION

2.1 Patient Information

A 16-year-old male presented to the urology outpatient department with a complaint of a left testicular mass. The swelling had been noted since childhood and was reported to have remained stable in size over the years. The patient denied pain, recent enlargement, or change in the overlying scrotal skin. There was no history of trauma, erythema, discharge, or systemic symptoms such as fever, weight loss, or anorexia.

2.2 Clinical Examination

Examination of the external genitalia revealed a hard, non-tender mass confined to the left hemiscrotum. The upper pole of the left testis was separately palpable, suggesting that the lesion arose from or was closely related to the lower pole of the testis. There were no signs of scrotal inflammation, erythema, or skin tethering. The transillumination test was negative, making a simple hydrocele unlikely. The contralateral testis and both epididymides were normal on palpation.

3 INVESTIGATIONS

3.1 Scrotal Ultrasonography

Scrotal ultrasonography performed on 14 May 2026 demonstrated:

- A well-defined cystic lesion measuring 3.6×2.0 cm at the upper pole of the left testis
- Internal septations

- No internal vascularity on colour Doppler
- Normal right testis and bilateral epididymides
- No hydrocele or varicocele
- Normal scrotal wall thickness without oedema

Sonographic impression: Features consistent with a testicular teratoma.

Contrast-Enhanced CT of the Thorax, Abdomen, and Pelvis

A staging CT performed on 3 June 2026 showed:

3.1.1 Thorax

- A 4 mm soft tissue nodule in the right middle lobe
- No mediastinal lymphadenopathy
- No pleural effusion or pneumothorax

3.1.2 Abdomen and Pelvis

- Multiple sub-centimetre pre- and para-aortic lymph nodes, largest 7 mm in the left para-aortic region
- A 3.2 × 2.7 × 3.1 cm well-defined heterogeneous lesion in the left scrotal sac
- Predominantly fat density with internal septations, soft tissue elements, and cystic areas
- No abnormalities in the liver, spleen, pancreas, kidneys, urinary bladder, or major vessels
- No bony lesions

3.1.3 CT Impression:

- Left scrotal heterogeneous lesion with fat, soft tissue, and cystic components, suggestive of mature cystic teratoma
- Indeterminate 4 mm pulmonary nodule, follow-up advised
- Sub-centimetre para-aortic lymph nodes

3.2 Laboratory Investigations

Preoperative serum tumour markers and hormonal profile were within normal limits:

Table 1: Serum Tumor Markers and Hormonal Profile in a Patient Presenting With a Left Testicular Mass

Investigation	Result	Interpretation
β-hCG	3 IU/L (mIU/mL)	<5 IU/L (mIU/mL)
AFP	8 ng/mL	<10 ng/mL
LDH	170 U/L	140–280 U/L
Serum Testosterone	5.26 ng/mL	0.2–9.5 ng/dL

Normal tumour markers are not uncommon in pure teratoma and do not exclude malignant potential in postpubertal males [3,8].

4 MANAGEMENT

Following multidisciplinary review and informed consent, the patient underwent left radical inguinal orchidectomy. (Figure-1) This remains the standard approach for a suspected testicular malignancy, allowing en bloc removal of the testis and spermatic cord while minimising the risk of scrotal violation and disruption of lymphatic drainage [9,10]. The procedure was uncomplicated, and recovery was uneventful.

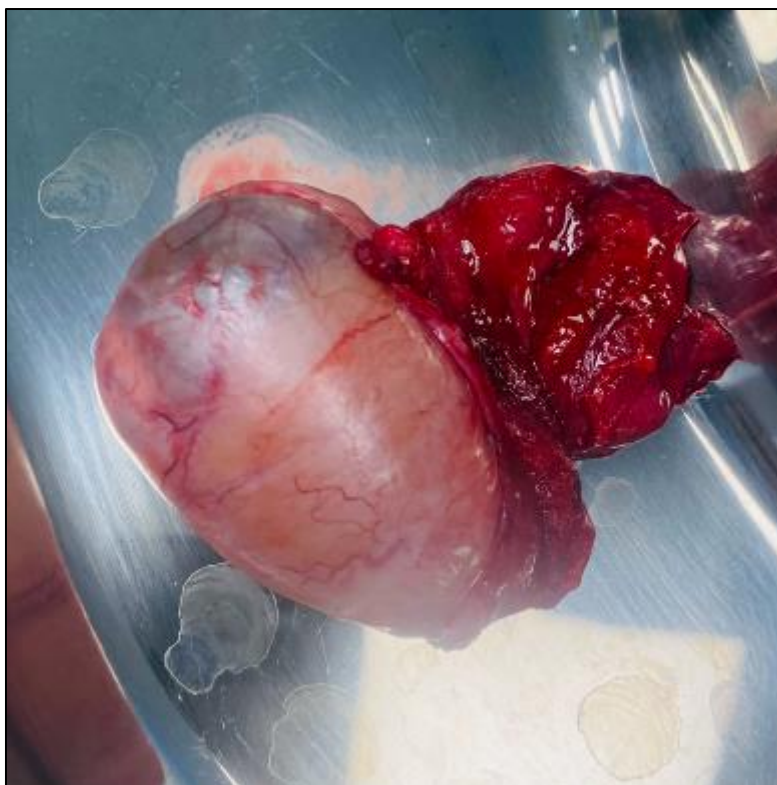


Figure 1: Gross specimen of left testicular mass

5 HISTOPATHOLOGICAL FINDINGS

5.1 Gross examination showed:

- Testis size: 60 × 40 × 25 mm
- Spermatic cord length: 90 × 15 mm
- Tumour size: 35 × 25 × 35 mm
- Tumour limited to the testis
- Epididymis, tunica vaginalis, and spermatic cord margin uninvolved

5.2 Microscopy demonstrated:

- Testicular teratoma composed of:
 - Cartilage
 - Skin and adnexal structures
 - Respiratory epithelium
- No additional germ cell tumour components identified
- No evidence of intratubular germ cell neoplasia

5.3 Final diagnosis:

Left testis, orchidectomy: Pure teratoma, 35 mm, completely excised, confined to the testis, spermatic cord margin free of tumour.

The pathology report appropriately noted that all teratomas in postpubertal males have malignant potential, and clinical follow-up was recommended.

6 DISCUSSION

6.1 Overview of Testicular Teratoma

Testicular teratoma is a subtype of NSGCT and may be classified as prepubertal-type or postpubertal-type. This distinction is crucial because morphology alone does not fully predict behaviour. Prepubertal-type teratomas are typically benign and not associated with GCNIS or chromosome 12p abnormalities. Postpubertal teratomas, however,

are regarded as malignant germ cell tumours, often associated with GCNIS and capable of metastasis despite mature histologic appearance [1,2,4].

Although our patient had a mass that reportedly existed since childhood, the lesion was diagnosed after puberty in a 16-year-old male. In clinical practice, such lesions are managed according to postpubertal oncological principles, as age at presentation and pubertal status are more relevant for malignant potential than the apparent duration of symptoms [2,4].

6.2 Epidemiology

Testicular cancer is the most common solid malignancy in adolescent and young adult males, but pure teratoma of the testis is relatively rare, accounting for a small proportion of testicular germ cell tumours in adults [3,11]. Pure teratomas are much less common than mixed germ cell tumours containing teratomatous elements.

6.3 Clinical Presentation

Patients with testicular teratoma typically present with a painless testicular mass, often detected incidentally or by self-examination [6,12]. Pain is less common and may result from haemorrhage or infarction. A long-standing stable mass, as in the present case, can delay presentation because the absence of alarming symptoms may falsely reassure patients and families.

6.4 Imaging Findings

Scrotal ultrasound is the first-line imaging modality for evaluating a testicular mass. Teratomas often appear as well-circumscribed heterogeneous intratesticular lesions with mixed cystic and solid components; calcifications and echogenic foci from fat may also be seen [6,7]. The lack of internal vascularity in this case supported a complex cystic lesion but did not exclude malignancy.

CT is not routinely required for diagnosis of the primary lesion but is essential for staging suspected malignant germ cell tumours [9,10]. The presence of fat, soft tissue, and cystic elements on CT is highly suggestive of teratoma [6]. In this patient, the para-aortic nodes were sub-centimetre and therefore indeterminate, while the small pulmonary nodule also required surveillance rather than immediate intervention.

6.5 Serum Tumour Markers

Pure teratomas are frequently associated with normal AFP and β -hCG, unlike yolk sac tumour or choriocarcinoma components [3,8]. Thus, normal tumour markers should not be interpreted as evidence of benign disease in postpubertal males with intratesticular masses.

6.6 Pathology and Biological Behaviour

Histologically, mature teratoma is composed of well-differentiated tissues such as cartilage, respiratory epithelium, skin, neural tissue, or glandular structures [1,2]. The present specimen showed cartilage, cutaneous adnexal structures, and respiratory epithelium without immature elements or other germ cell components, consistent with pure mature teratoma.

A notable feature in this case is the absence of intratubular germ cell neoplasia. While postpubertal teratomas commonly arise from GCNIS, not every case demonstrates identifiable intratubular precursor lesions on histology [1,4]. Nevertheless, according to current WHO and urologic oncology concepts, a teratoma in a postpubertal male should still be considered to have malignant potential based on clinical context [1,2].

6.7 Surgical Management

Radical inguinal orchidectomy is the established standard for any suspicious intratesticular neoplasm [9,10]. Testis-sparing surgery may be considered only in highly selected circumstances, such as bilateral tumours, a solitary testis, or very small masses with favourable features, and usually after intraoperative frozen section assessment [13]. In this case, the preoperative concern for malignancy made inguinal orchidectomy the most appropriate treatment.

6.8 Prognosis and Follow-up

For stage I pure teratoma confined to the testis with negative margins and normal markers, prognosis is generally favourable after orchidectomy, but surveillance is necessary because teratoma can metastasise and is relatively resistant to chemotherapy once mature elements are established [5,9,14]. Retroperitoneal recurrence or residual teratoma may require surgical resection. Long-term monitoring typically includes clinical review, serum markers, and interval imaging in accordance with local or international germ cell tumour protocols [9,10].

The indeterminate para-aortic lymph nodes and 4 mm pulmonary nodule in this patient do not establish metastatic disease. Small-volume findings of this nature are commonly followed with repeat imaging, particularly when tumour markers are normal and pathology confirms localised disease.

6.9 Review of Relevant Literature

The literature consistently emphasises the distinction between prepubertal and postpubertal teratoma. Berney et al. and the WHO classification stress that postpubertal teratoma belongs within the spectrum of malignant germ cell tumours, regardless of apparent maturity [1,2]. Ulbright has extensively described the pathology of testicular tumours and highlighted the need to correlate histology with clinical age and tumour context [4]. Dieckmann and colleagues have discussed the biological and clinical significance of pure teratoma and mixed germ cell tumours [11].

From an imaging standpoint, Woodward et al. and Dogra et al. describe the sonographic heterogeneity, cystic change, and occasional calcification seen in teratoma, features that may suggest but not definitively establish the diagnosis [6,7]. Urologic guidelines from the European Association of Urology (EAU) and American Urological Association (AUA) support radical inguinal orchidectomy for suspicious intratesticular masses and CT-based staging for testicular cancer [9,10].

This case adds to the existing literature by illustrating an unusual chronically stable lesion first noted in childhood but diagnosed after puberty, radiologically compatible with mature teratoma and histologically confirmed as pure teratoma without GCNIS. It reinforces the principle that such lesions in adolescent/postpubertal patients require definitive oncological management despite indolent behaviour.

7 CONCLUSION

This case demonstrates that a long-standing, painless, stable intratesticular mass in an adolescent male may still represent a postpubertal pure teratoma with malignant potential. Imaging may strongly suggest the diagnosis when fat, cystic, and soft tissue elements coexist, but normal tumour markers do not exclude malignancy. Radical inguinal orchidectomy remains the cornerstone of diagnosis and treatment. Histopathology determines the final diagnosis, and careful postoperative surveillance is essential given the recognised malignant behaviour of postpubertal teratoma.

Learning Points

- Any intratesticular mass in a postpubertal male should be considered malignant until proven otherwise.
- Pure teratoma may present with normal AFP, β -hCG, and LDH.
- Ultrasound and CT can suggest teratoma when fat, cystic, and septated components are present, but imaging is not definitive.
- Radical inguinal orchidectomy is the standard management for suspected testicular malignancy.
- In postpubertal males, even histologically mature teratomas carry malignant potential and require follow-up.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of informed consent

Written informed consent for publication of the case details and imaging/pathology findings should be obtained from the patient and guardian prior to submission.

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