E-ISSN : 2962-9713
P-ISSN : 2963-928X

Prepubertal Testicular Yolk Sac Tumor: A Case Report

Thalia Laurent Lumentut[1], Trifosa Stella Chowindra[2]
[1]Division of Pediatric Surgery, Department of Surgery Undata Hospital, thalialaurent20@gmail.com
[2]Division of Pediatric Surgery, Department of Surgery Undata Hospital, trifosa_stella@ymail.com

Abstract

Testicular yolk sac tumor (YST) is an uncommon but important malignant germ cell tumor in prepubertal boys. This case report describes a 1-year-old boy who presented with painless enlargement of the right hemiscrotum and a firm intratesticular mass. Scrotal ultrasonography revealed a heterogeneous lesion with cystic areas and intralesional vascularity. Preoperative serum alpha-fetoprotein (AFP) was markedly elevated at 44,000 ng/mL, supporting the suspicion of a malignant germ cell tumor. The patient underwent right radical inguinal orchiectomy, and histopathological examination demonstrated Schiller–Duval bodies, confirming the diagnosis of testicular YST. On postoperative day 1, serum AFP decreased to approximately 36,000 ng/mL, representing an initial reduction of 18.2%; however, further serial measurements were required to evaluate AFP kinetics and monitor potential residual disease or recurrence. This case highlights the importance of age-appropriate AFP interpretation, ultrasonography, and histopathological examination in diagnosing pediatric testicular YST. Radical inguinal orchiectomy is an important treatment option for suspected malignant testicular tumors, while serial postoperative AFP monitoring and structured clinical surveillance are essential for assessing treatment response and detecting potential recurrence.

Keywords: *Yolk sac tumor, alpha-fetoprotein, orchiectomy, pediatric.*

Corresponding Author:
Thalia Laurent Lumentut
Undata Hospital, thalialaurent20@gmail.com

INTRODUCTION

Testicular tumors are uncommon in childhood, accounting for a small proportion of pediatric solid tumors. Their histologic s36pectrum differs substantially from that of adult testicular malignancies. In prepubertal boys, germ cell tumors are dominated by yolk sac tumor (YST) and teratoma, while the tumor biology and management strategy differ from those of postpubertal germ cell tumors [1–4]. Large population-based series have confirmed that YST is the most frequent malignant testicular neoplasm in prepubertal children and that most patients present at an early stage [5,6].

Testicular YST, also known as endodermal sinus tumor, is an extraembryonic germ cell tumor characterized by production of alpha-fetoprotein (AFP). AFP is particularly useful in young children because a markedly elevated value in the

appropriate clinical setting strongly supports the diagnosis and can subsequently be used as a dynamic marker of treatment response and surveillance [1,2,7]. However, AFP must always be interpreted according to age because physiologic concentrations are higher during infancy and may take time to reach the normal range [7].

The usual presentation is a painless unilateral scrotal or testicular enlargement. Ultrasonography is the first-line imaging modality for an intratesticular mass and can demonstrate a heterogeneous solid lesion, cystic components, and internal vascularity [2,7]. Once a malignant testicular tumor is suspected, the inguinal approach is preferred because it permits control of the spermatic cord and avoids violating the scrotal compartment. Depending on the preoperative findings, age, AFP concentration, and amount of preserved testicular tissue, either testis-sparing surgery or radical inguinal orchiectomy may be considered [7,8].

We present a case of a 1-year-old boy with a painless unilateral scrotal mass, markedly elevated serum AFP, and histopathologically confirmed testicular YST. The case emphasizes the diagnostic value of AFP, the characteristic clinical and ultrasonographic findings, the role of inguinal orchiectomy, and the importance of serial postoperative AFP surveillance.

CASE PRESENTATION

A 1-year-old boy presented with painless enlargement of the right hemiscrotum. Physical examination revealed a firm right intratesticular mass. The clinical appearance of the scrotal enlargement is shown in Figure 1.

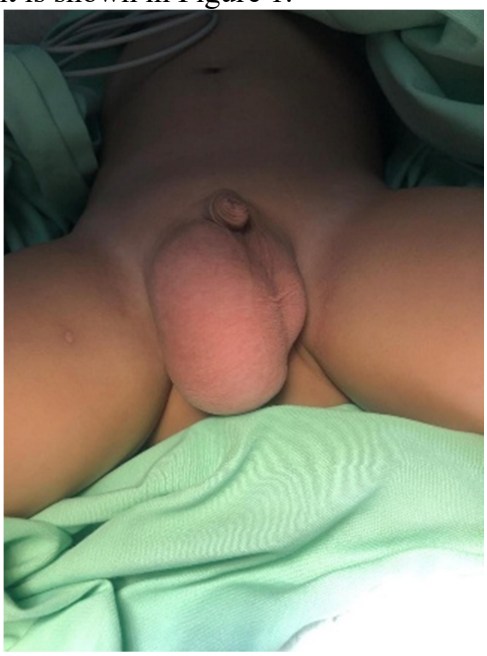


Figure 1. Preoperative clinical appearance showing unilateral enlargement of the right hemiscrotum.

Scrotal ultrasonography demonstrated a heterogeneous intratesticular lesion containing cystic areas and intralesional vascularity. These findings, together with the palpable intratesticular mass, raised suspicion of a testicular neoplasm, particularly yolk sac tumor (YST).

Preoperative laboratory evaluation included a complete blood count, serum electrolytes, coagulation testing, serum alpha-fetoprotein (AFP), and HBsAg

E-ISSN : 2962-9713
P-ISSN : 2963-928X

screening. Serum AFP was markedly elevated at 44,000 ng/mL. Bleeding time (BT) was 4 minutes (reference range, 1–5 minutes), and clotting time (CT) was 7 minutes (reference range, 4–10 minutes); both were within the stated reference ranges. HBsAg was non-reactive. The detailed hematologic, electrolyte, and coagulation results are presented in Tables 1–3.

A chest radiograph in the anteroposterior view showed no apparent cardiopulmonary abnormality. The bronchovascular markings were within normal limits, the cardiac silhouette was not enlarged, and both costophrenic angles and diaphragms were preserved. Based on the patient's age, clinical presentation, ultrasonographic findings, and markedly elevated AFP, a malignant testicular germ cell tumor, particularly YST, was strongly suspected.

The patient underwent right radical inguinal orchiectomy. Gross examination of the surgical specimen revealed an enlarged testis with a predominantly solid, yellow-tan, lobulated cut surface. Histopathological examination demonstrated Schiller–Duval bodies, confirming YST. On postoperative day 1 (POD 1), the serum AFP level was approximately 36,000 ng/mL, compared with the preoperative level of 44,000 ng/mL. This represents an approximately 18.2% decrease; however, an early change over one day should be interpreted cautiously, and subsequent serial measurements are needed to assess AFP kinetics. Continued AFP monitoring was planned as part of postoperative surveillance.

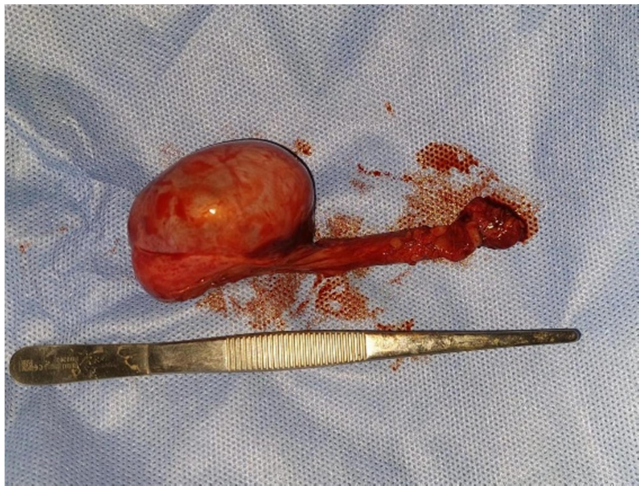


Figure 2. Gross appearance of the resected right testis with the attached spermatic cord.



6

E-ISSN : 2962-9713
P-ISSN : 2963-928X

Figure 3. Cut surface of the resected testicular mass showing a predominantly solid, yellow-tan lesion.

Table 1. Complete blood count and hematologic profile.

Parameter	Result	Unit	Reference range
WBC	10.3	$10^3/\mu L$	6.0–17.5
RBC	6.10	$10^6/\mu L$	4.1–5.1
Hemoglobin	13.7	g/dL	10.5–13.1
Hematocrit	42.7	%	33–45
MCV	70.0	fL	69–93
MCH	22.5	pg	22–34
MCHC	32.1	g/dL	32–36
RDW	14.4	fL	11–15
Platelet	424	$10^3/\mu L$	150–450
MPV	8.0	fL	6.5–9.5
PDW	17.9	fL	—
Neutrophils	40.1	%	25–60
Lymphocytes	45.0	%	20–40
Monocytes	10.1	%	2–8
Eosinophils	3.6	%	1–3
Basophils	1.2	%	0–1
Immature granulocytes	0.1	%	—
ESR	9	mm/h	<10

Table 2. Serum electrolyte profile.

Parameter	Result	Unit	Reference range
Sodium	140	mmol/L	136–146
Potassium	5.4	mmol/L	3.5–5.0
Chloride	103	mmol/L	98–106

Table 3. Coagulation profile.

Parameter	Result	Unit	Reference range
Clotting time (CT)	7	min	4–10
Bleeding time (BT)	4	min	1–5

The complete blood count was generally within the laboratory's stated pediatric reference ranges, although the recorded RBC count, hemoglobin, lymphocyte percentage, monocyte percentage, eosinophil percentage, and basophil percentage were above the displayed reference intervals. Serum potassium was mildly elevated at 5.4 mmol/L, while sodium and chloride were within the stated reference ranges. These findings were documented as part of the preoperative assessment and were not used as diagnostic markers for YST.

DISCUSSION

Testicular tumors are uncommon in childhood, and their histologic distribution differs from that observed in adolescents and adults. In prepubertal boys, yolk sac tumor (YST) is the most common malignant testicular germ cell tumor, whereas teratomas and some stromal lesions may follow a more benign course. These age-related differences are important when evaluating a testicular mass in a young child. In this case, the patient was 1 year old and presented with painless unilateral scrotal enlargement and a firm intratesticular mass, a clinical presentation compatible with pediatric testicular YST [1,4–6,14,15].

Serum alpha-fetoprotein (AFP) is particularly useful in the evaluation of suspected YST because tumor cells commonly produce this marker. AFP can also be physiologically elevated during infancy; therefore, the patient's age and age-specific reference values should be considered when interpreting the result. The markedly elevated preoperative AFP concentration of 44,000 ng/mL in this patient strongly supported suspicion of a yolk sac tumor in the context of the clinical and ultrasonographic findings. Nevertheless, AFP should not be interpreted in isolation, and the diagnosis requires correlation with imaging and histopathology [1,2,5,7].

Scrotal ultrasonography is the first-line imaging investigation for a suspected intratesticular mass. In this patient, ultrasound demonstrated a heterogeneous lesion with cystic areas and intralesional vascularity. These findings supported the presence of a testicular neoplasm, but they are not specific enough to establish the histologic diagnosis by themselves. The definitive diagnosis was obtained after surgery, when histopathological examination demonstrated Schiller–Duval bodies, a characteristic feature of YST. This illustrates the complementary roles of clinical examination, tumor markers, imaging, and histopathology in the diagnostic process [2,8,9].

Right radical inguinal orchiectomy was performed because the clinical presentation and markedly elevated AFP raised concern for a malignant germ cell tumor. The inguinal approach allows removal of the affected testis through an oncologically appropriate route and provides tissue for definitive diagnosis. Although testis-sparing surgery may be considered for selected prepubertal testicular lesions when clinical, imaging, and intraoperative findings support a benign process, the concern for malignancy in this case supported radical orchiectomy [3,6,15].

The serum AFP level was approximately 36,000 ng/mL on postoperative day 1 (POD 1), compared with 44,000 ng/mL before surgery, representing an initial decrease of approximately 18.2%. This early decrease should be interpreted cautiously. A measurement obtained only one day after surgery cannot, by itself, establish treatment response, confirm the absence of residual disease, or allow reliable calculation of the patient's AFP half-life. Further serial AFP measurements, recorded with their dates, are needed to evaluate the subsequent trend. Persistently elevated or rising AFP during follow-up should prompt clinical reassessment and appropriate investigation [5,7,11].

Postoperative evaluation should also include appropriate assessment of disease extent and a structured surveillance plan. A normal chest radiograph alone is insufficient to establish that disease is localized, and complete staging information was not available in this case; therefore, a definitive clinical stage cannot be assigned from the documented findings. Although outcomes for localized pediatric testicular YST are generally favorable, recurrence may occur, making follow-up with clinical assessment and serial AFP monitoring important [3,5,8,10,11]. This case emphasizes the value of recognizing a painless testicular mass in an infant, interpreting AFP in the context of age, confirming the diagnosis histologically, and documenting staging and postoperative marker trends.

CONCLUSION

Prepubertal testicular yolk sac tumor is an uncommon but important pediatric malignancy that should be considered in infants and young boys presenting with a painless unilateral testicular or scrotal mass. Markedly elevated AFP is highly informative in this setting and is useful not only for diagnosis but also for postoperative surveillance. Ultrasonography supports the initial evaluation, while histopathologic examination establishes the definitive diagnosis. Radical inguinal orchiectomy remains an important treatment for selected malignant tumors, although testis-sparing surgery may be appropriate in carefully selected prepubertal patients. Serial AFP monitoring and structured surveillance are essential because recurrence can occur even after apparently localized disease.

REFERENCES

Li M, Wang J, Wang J, Zhang D, Hua Y, Liu F, et al. Characteristics and outcomes of pediatric testicular yolk sac tumor. Front Pediatr. 2022;10:1024906. doi:10.3389/fped.2022.1024906.

Wang Z, Lu F, Song C, Wang X, Li N, Zhai J, et al. Ultrasonic misdiagnosis of giant pediatric testicular yolk sac tumor: a case report and literature review. Front Pediatr. 2022;10:1058037. doi:10.3389/fped.2022.1058037.

Fernandez-Pineda I, De Corti F, Hinojosa AS, Murphy AJ, Hiyama E, Heij HA, et al. IPSO surgical oncology guidelines for children with malignant testicular tumors. ecancermedicalscience. 2022;16:1356. doi:10.3332/ecancer.2022.1356.

O'Shea K, Tong A, Farrelly P, Craigie R, Cheesman E, Shukla R, et al. Management and outcome of paediatric testicular tumours: a 20-year experience. J Pediatr Surg. 2021;56(11):2032-2036. doi:10.1016/j.jpedsurg.2021.02.063.

Maizlin II, Dellinger M, Gow KW, Goldin AB, Goldfarb M, Nuchtern JG, et al. Testicular tumors in prepubescent patients. J Pediatr Surg. 2018;53(9):1748-1752. doi:10.1016/j.jpedsurg.2017.09.020.

Liu P, Li W, Song HC, Jiao LL, Zhang WP, Sun N. Characteristics, treatment decisions and outcomes of prepubertal testicular germ cell tumor: a descriptive analysis from a large Chinese center. J Pediatr Urol. 2018;14(5):443.e1-443.e7. doi:10.1016/j.jpurol.2018.02.030.

European Association of Urology. EAU Guidelines on Paediatric Urology: Testicular tumours in prepubertal boys. Arnhem: EAU Guidelines Office; 2026.

Carachi R, Grosfeld JL, editors. The Surgery of Childhood Tumors. 3rd ed. Berlin: Springer; 2016.

Wei Y, Wu S, Lin T, He D, Li X, Liu J, et al. Testicular yolk sac tumors in children: a review of 61 patients over 19 years. World J Surg Oncol. 2014;12:400. doi:10.1186/1477-7819-12-400.

Liu HC, Liang DC, Chen SH, Liu FL, Chang PY, Sheu JC, Wang NL. The stage I yolk sac tumor of testis in children younger than 2 years, chemotherapy or not? Pediatr Hematol Oncol. 1998;15(3):223-228. doi:10.3109/08880019809028788.

Ye YL, Zheng FF, Chen D, Zhang J, Liu ZW, Qin ZK, et al. Relapse in children with clinical stage I testicular yolk sac tumors after initial orchiectomy. Pediatr Surg Int. 2019;35(3):383-389. doi:10.1007/s00383-018-04426-5.

Akiyama S, Ito K, Kim WJ, Tanaka Y, Yamazaki Y. Prepubertal testicular tumors: a single-center experience of 44 years. J Pediatr Surg. 2016;51(8):1351-1354. doi:10.1016/j.jpedsurg.2016.02.042.

Steffens J, et al. Management of pediatric testicular tumors: diagnosis, therapy, and follow-up. Urologe A. 2009;48(3):312-318. doi:10.1007/s00120-009-1944-1.

Puri P, Höllwarth ME, editors. Pediatric Surgery: Diagnosis and Management. Chapter 78, Testis Tumors. Berlin: Springer; 2009.

Holcomb GW III, Murphy JP, St Peter SD, editors. Holcomb and Ashcraft's Pediatric Surgery. 8th ed. Chapter 50, Testicular Neoplasms. Elsevier.