

A Rare Case of Pediatric Vaginal Yolk Sac Tumor

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A 14-month-old girl was evaluated for intermittent vaginal bleeding. Vaginoscopy revealed a friable tumor, and biopsy results confirmed a yolk sac tumor. Alpha-fetoprotein was elevated (1386 ng/mL) at diagnosis but quickly normalized with chemotherapy. The patient remained tumor-free 12 months after diagnosis without the need for radical surgery. Although rare, malignant tumors of the vagina must be included in the differential diagnosis of prepubertal girls who present with vaginal bleeding. Primary yolk sac tumor of the vagina is seen in girls less than 3 years of age and is treated with chemotherapy with or without surgical excision. Prognosis is good with appropriate treatment. UROLOGY ■■■: ■■■-■■■, 2018. © 2018 Elsevier Inc.

Vaginal bleeding in a female infant or prepubertal child is rare and may be related to a number of etiologies including accidental or inflicted trauma (including sexual abuse), vulvovaginitis, precocious puberty, neonatal hormonal withdrawal, urethral prolapse, and foreign body, or may be idiopathic in nature. However, genital or vaginal tumors have been reported as the cause of vaginal bleeding in 2%-21% of prepubertal patients and must be considered in the differential diagnosis, as early diagnosis and treatment are associated with improved survival and lower morbidity.^{1,2} Here we present a rare case of primary vaginal yolk sac tumor in a young girl.

CASE REPORT

A 14-month-old female child was seen in the outpatient pediatric urology clinic with a chief complaint of intermittent blood in the diaper for 4-5 months. The patient had previously been evaluated in the emergency department, at which point the spotting was attributed to rectal bleeding associated with *Clostridium difficile* diarrhea. However, the mother reported that the bleeding was persistent and vaginal in origin, and the child was eventually referred to pediatric urology for further evaluation. Physical examination was unrevealing, with normal-appearing prepubertal genitalia. Renal and bladder ultrasound and urinalysis were unremarkable, and the patient was scheduled for diagnostic cystoscopy and vaginoscopy. The patient was seen to have a complete left ureteral duplication intraoperatively, but no other intravesical abnormalities were found. However, vaginoscopy revealed a friable tumor emanating from the right and posterior vaginal wall (Fig. 1).

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Cold cup biopsy of the mass was performed, and hematoxylin and eosin staining showed a highly vascular tumor with microcystic architecture. Cell nuclei were enlarged and pleomorphic, with mucinous material seen throughout the tumor. Immunohistochemistry showed positive staining for alpha-fetoprotein (AFP), glypican 3, and cytokeratin, and negative staining for epithelial membrane antigen, CD30, CD117, Oct E, desmin, and myogenin. This was consistent with a final diagnosis of a pure yolk sac tumor.

The patient was immediately referred to pediatric oncology, and a full staging workup was performed. Computed tomography (CT) and magnetic resonance imaging (MRI) revealed a 3.6 × 2.3 × 2.5 cm vaginal mass (Figs. 2 and 3) without distant metastases, and serum AFP was elevated at 1386 ng/mL. Beta hCG was within normal limits.

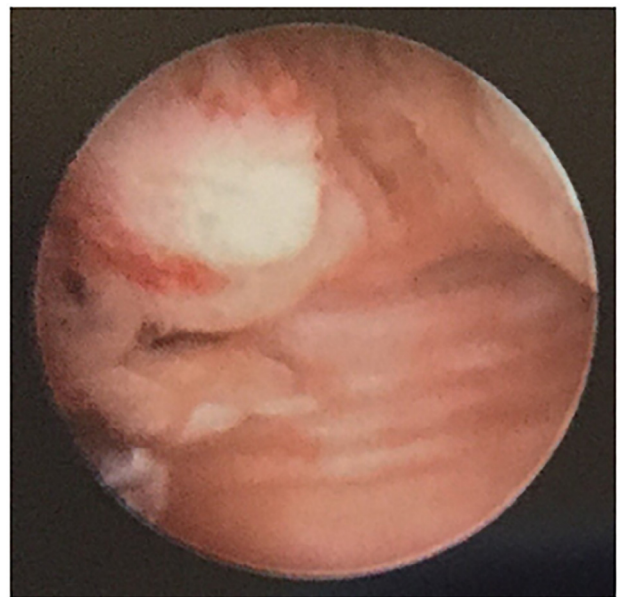


Figure 1. Friable vaginal tumor as seen on vaginoscopy. (Color version available online.)

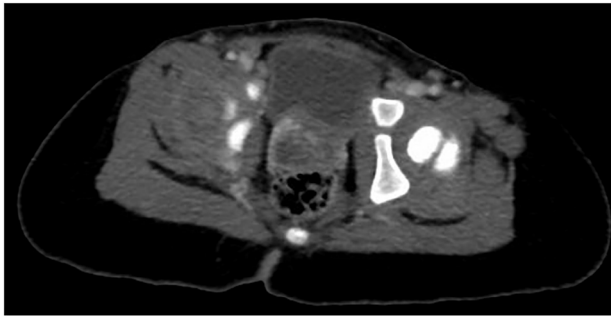


Figure 2. Initial staging computed tomographic image showing the heterogeneous vaginal mass.

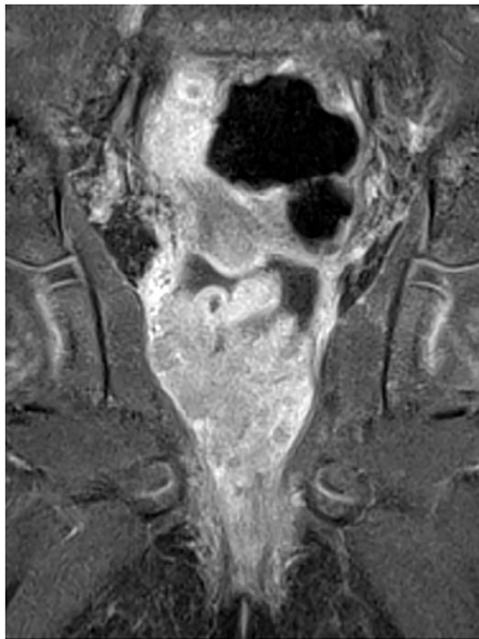


Figure 3. Coronal T1 magnetic resonance image showing lobulated vaginal mass with a normal cervix.

The patient completed 4 cycles of cisplatin, etoposide, and bleomycin (PEB). Her AFP normalized after the second cycle of chemotherapy and has remained within normal limits (2 ng/mL). Surveillance CT, MRI, and vaginoscopy have shown no evidence of recurrent or residual tumor 12 months after diagnosis.

DISCUSSION

Primary vaginal tumors are rare at any age. In adults, the most common histologies are squamous cell carcinoma and adenocarcinoma, whereas clear cell carcinoma in young women has historically been associated with maternal diethylstilbestrol exposure. A British epidemiologic report from 1984 stated an estimated incidence of primary vaginal tumors of 0.25 per million female children per year.³ Embryonal rhabdomyosarcoma (sarcoma botryoides) is the most common primary vaginal tumor in prepuber-

tal children, which classically appears as a “cluster of grapes” vaginal mass. This comprises approximately 70%-75% of pediatric vaginal tumors but <1% of all pediatric tumors.^{3,4}

Yolk sac tumor, also known as endodermal sinus tumor, typically arises from the ovary or testis. However, it may also develop at extragonadal sites including the vagina.⁵ This occurs almost exclusively in girls less than 3 years of age, with a recent review reporting a mean age of 14.0 months at diagnosis. The presenting symptom is vaginal bleeding in nearly all cases, and a vaginal mass is often seen on physical examination. Histologic examination of biopsy specimens combined with an elevated serum AFP confirms the diagnosis, although yolk sac tumor may also occur as a component of a mixed germ cell tumor.⁶

Pathologic examination of biopsy or resection specimens typically show cells arranged in a loose reticular pattern. Papillary structures with a vascular core lined by a single layer of cells (Schiller-Duval bodies) may be seen in yolk sac tumors from any site and are pathognomonic when present. Immunohistochemistry is typically positive for AFP, but staining patterns for other markers are variable.^{7,8}

Because of the rarity of this malignancy, internationally standardized treatment or follow-up protocols have not been developed. In the past, treatment for vaginal yolk sac tumor had consisted of radical extirpative surgery (ie, vaginectomy, hysterectomy) followed by adjuvant chemotherapy and radiation. However, in recent years, more of these tumors have been treated successfully with organ-sparing surgery including some with chemotherapy alone. After a biopsy to confirm the diagnosis, chemotherapy with PEB is begun. If the patient is unable to receive bleomycin due to respiratory concerns, then alternative regimens such as cisplatin, etoposide, and vincristine or vincristine, dactinomycin, and cyclophosphamide may be used. Chemotherapy is continued as consolidation treatment for 2-3 cycles after AFP normalizes, and complete pathologic remission should be confirmed with imaging (CT or MRI). Repeat vaginoscopy for direct evaluation of the tumor site should also be considered, with biopsies of any anomalies seen. Patients should be monitored with regular physical examinations, serum AFP, complete blood count, liver function tests, creatinine, and imaging for local or metastatic recurrence.⁹ A literature review of 77 reported cases showed a 5-year overall survival of 87.6%.⁶ Unfortunately, long-term outcomes including data on sexual function, fertility, and childbearing after treatment for vaginal yolk sac tumor are not available.

CONCLUSION

Persistent vaginal bleeding in a prepubescent girl should be evaluated by vaginoscopy and biopsy if indicated, with prompt therapy instituted for any malignant tumor discovered. Patients with vaginal yolk sac tumor have a generally good prognosis, and treatment with chemotherapy

alone or in combination with organ-sparing surgical resection may allow preservation of later sexual function and fertility.

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