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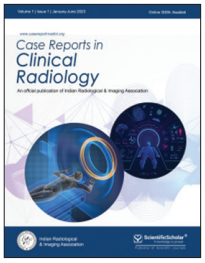

Case Series

MRI of rare vaginal tumors: Report of two cases

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ABSTRACT

Tumors of the vagina are overall rare and unexplored entities and thus often pose diagnostic dilemmas. We report two rare malignant vaginal tumors and their magnetic resonance imaging (MRI) appearances. We describe two cases of rare vaginal malignancies. In the first case of a 29-year-old married, nulliparous woman, MRI revealed a T2 heterogeneous peripherally enhancing mass involving the upper vagina and the cervix. The uterus was uninvolved. A biopsy was obtained, which showed features of choriocarcinoma. In the second case of a 13-year-old adolescent girl, MRI revealed a T2 hyperintense, moderate to intensely enhancing mass within the vagina. The patient was examined, and tissue sampling was obtained, which showed embryonal rhabdomyosarcoma (RMS). Primary choriocarcinoma and embryonal RMSs of the vagina are extremely rare. Choriocarcinomas are treated by chemotherapy and RMSs by chemotherapy, surgery, and/or radiation therapy. Accurate characterization and staging on imaging help in appropriate intervention.

Keywords: Choriocarcinoma, Rhabdomyosarcoma, Vaginal, Tumors, Magnetic resonance imaging

INTRODUCTION

Tumors of the vagina are overall less common gynecological neoplasms. The common presenting symptoms are post menopausal bleeding, vaginal discharge, dyspareunia and lower abdominal pain. Although, squamous cell carcinoma is the most common vaginal malignancy, other rarer tumors can also occur in the vagina and often pose diagnostic dilemmas for the radiologist. The radiological features of these tumors have not been discussed in detail in the literature. In this case series, we report the MRI features of two rare vaginal tumors.

CASE 1

A 29-year-old married, nulliparous woman, presented to the department of gynecology with pelvic pain, abnormal vaginal bleeding, and increased frequency of urination for the past 3 months. Bowel functions were normal. Previous menstrual history was normal. There was no history of any prior abortion or live birth. On clinical examination, her vitals were stable. On per-abdominal examination, a pelvic lump of 16 weeks gestation was palpated. On per vaginal examination, an obstructive mass was felt in the vagina. Investigations revealed anemia (Hemoglobin: 9.0 g/dL) and normal liver and renal function tests. The urine pregnancy test was positive. Serum beta human chorionic gonadotropin (HCG) was 256,743 IU/L (<5.0 IU/L for non-pregnant women). Other tumor markers were negative.

An ultrasound examination revealed a hypoechoic mass within the upper vaginal canal. Magnetic resonance imaging (MRI) examination was done for further evaluation. MRI scan [Figure 1] showed a mass within the upper vaginal canal, 2.5 cm proximal to the introitus. On T1-weighted

(T1W), the mass showed a low to intermediate signal and had a hyperintense rim. On T2-weighted (T2W), the mass showed areas of mixed hyper and hypointense regions. On post-contrast, the mass showed predominantly peripheral enhancement. The central portion was predominantly non-enhancing. The cervix also appeared to be involved by the lesion. The uterus was not involved. No extension was seen outside the vaginal walls. The mass was compressing the posterior wall of the urinary bladder with no obvious invasion. Fat plane with rectum was well maintained. A solitary enlarged right obturator lymph node (size: 1.2 cm on short axis) was seen. No ascites or focal fluid collection were present.

A biopsy of the mass was done under local anesthesia. Histopathology confirmed choriocarcinoma with no other germ cell component. A computed tomography (CT) scan of the chest and abdomen revealed no metastasis. The patient was given chemotherapy (etoposide, methotrexate, actinomycin, and cisplatin). The beta-HCG levels dropped to 4808 IU/L after 3 weeks of initiation of chemotherapy.

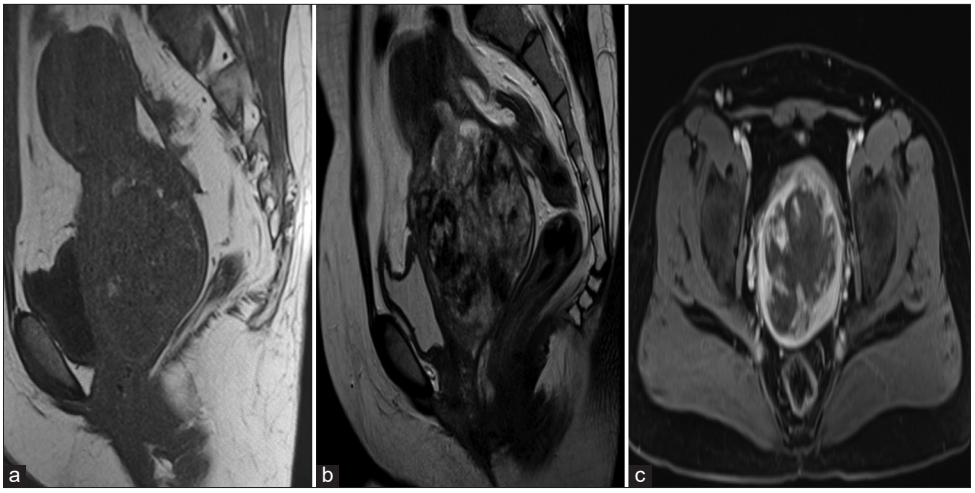

Figure 1: Magnetic resonance imaging of primary choriocarcinoma of vagina. (a) Sagittal T1-weighted shows that the lesion is low to intermediate signal intensity and has a hyperintense rim. (b) Sagittal T2-weighted shows that the lesion is very heterogeneous with mixed signal intensity. The lesion also extends into the cervix. (c) Axial post-contrast fat-suppressed image shows predominantly peripheral enhancement of the mass.

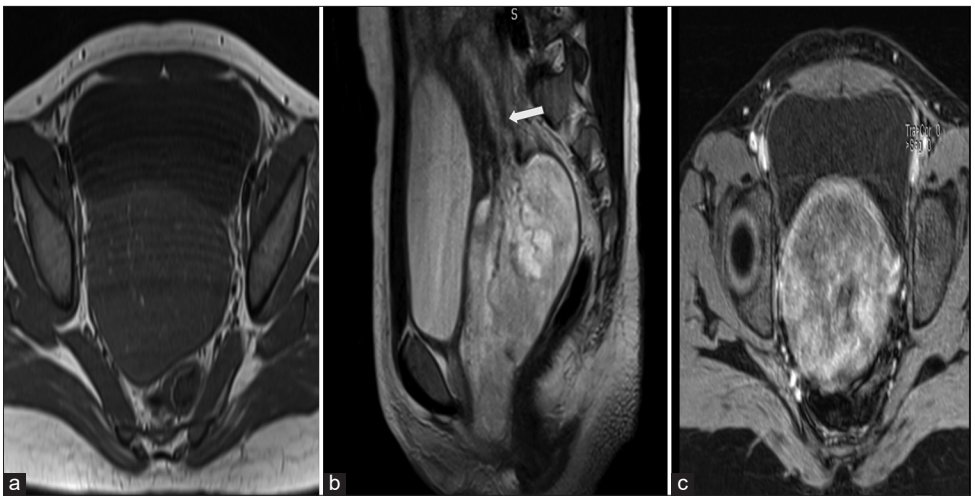

Figure 2: Magnetic resonance imaging of embryonal rhabdomyosarcoma. (a) Axial T1-weighted shows a low to intermediate signal intensity mass distending the vaginal canal. (b) Sagittal T2-weighted shows that the mass is hyperintense with a cyst-like appearance. Internal tortuous vessels are seen arising from the endometrium and coursing within the lesion (arrow). (c) Axial post-contrast fat-suppressed image shows moderate to intense enhancement of the mass.

DISCUSSION

Choriocarcinoma is one of the subtypes of gestational trophoblastic neoplasia, which also includes other entities such as hydatidiform mole, invasive mole, and placental site trophoblastic tumor.[1] Choriocarcinomas are malignant neoplasms that most commonly arise in the uterus in women of reproductive age. Vaginal bleeding and pelvic pain are the most common presenting symptoms. Clinically, it is difficult to diagnose this condition. Serum beta-HCG value and its serial monitoring are helpful.

Primary extrauterine choriocarcinoma is rare and most commonly arises in the cervix.[2] About 30% of cases have metastasis at the time of diagnosis. The vagina is the second most common site of metastasis after the lungs.[3] Thus, secondary choriocarcinomas are sometimes seen in the vagina. However, primary vaginal choriocarcinoma is extremely rare, and their imaging findings have not been detailed in the literature.

MRI plays a key role in lesion characterization and staging. Wong *et al*. described a case of primary vaginal choriocarcinoma in which MRI showed a T1 hypointense mass with hyperintense rim and peripheral rim enhancement.[4] In our case also, we noted the T1 hyperintense rim and peripheral enhancement. However, we also saw heterogeneous hyper and hypointensity on T2, which was not described earlier.

The clinical and imaging differentials include cervical polyps, vaginal carcinomas, and vaginal ectopic pregnancy. A biopsy is mandatory in indeterminate cases before initiating chemotherapy. Choriocarcinomas are chemosensitive, and hence, chemotherapy is the mainstay of treatment. Methotrexate is the most commonly used chemotherapeutic drug. Other drugs used in combination include etoposide, cisplatin, and actinomycin. Serum beta-HCG levels help in monitoring response to treatment. These tumors generally have a good prognosis, and complete cure occurs even in the presence of metastasis.

CASE 2

A 13-year-old girl presented to the department of gynecology with abnormal vaginal bleeding and a fleshy mass at the introitus for the last 5 months. Bladder and bowel functions were normal. She attained her menarche 1 year ago, and her previous menstrual cycles were normal. No significant past history was noted. On clinical examination, a polypoidal mass was seen at the introitus. The hematological profile and liver and kidney function tests were normal.

An ultrasound examination was done, which revealed an isoechoic mass distending the vaginal canal. The mass showed increased flow on color Doppler evaluation. MRI examination was done to characterize further and stage the lesion. On MRI, the lesion was isointense to myometrium on T1W and hyperintense on T2, giving it a cyst-like appearance. Few internal thin tortuous vessels were seen arising from the endometrium and coursing within the lesion. On post-contrast examination, the lesion showed moderate to intense enhancement. The enhancement was more marked in the lesion's periphery than in the center. No obvious extension was seen outside the vaginal walls. The lesion extended into the endocervical canal [Figure 2]. The lesion was compressing the posterior wall of the urinary bladder and the anterior wall of the rectum. However, there was no obvious bladder or bowel invasion. No obvious locoregional lymphadenopathy was seen. There were no ascites or any focal fluid collection. CT scans of the chest and abdomen were negative for metastasis.

The patient was examined under general anesthesia, and imprint smears for cytology and a punch biopsy of the lesion were taken. Both results were consistent with the embryonal variant of rhabdomyosarcoma (RMS). The patient was started on chemotherapy consisting of vincristine, adriamycin, and cyclophosphamide (VAC regimen). Symptomatic relief with reduction in the size of the mass was observed after three cycles of chemotherapy.

DISCUSSION

RMSs are the most common soft-tissue sarcoma and constitute 3–5% of all malignancies in childhood.[5] The head and neck are the most common site for RMS. About 15% of RMS occurs in the genitourinary tract, the second most common site. The various histological subtypes of RMS include pleomorphic, alveolar, and embryonal. Embryonal RMS is the most common type (60–70% of all RMS).[6]

RMS often involves the vagina. About 90% of cases of vaginal RMS occur in children <5 years (median age 1.8 years).[7] In adolescents and young adults, the uterus is most commonly involved.[8] Vaginal involvement is rare after puberty. In our case, the patient developed the lesion 1 year after menarche. Chauhan *et al*. reported embryonal RMS in a 23-year-old female.[9]

Ultrasound is often the first investigation done in such cases, but MRI also plays a crucial role in tumor characterization and in defining tumor extent. On MRI, RMS shows low to intermediate signal intensity on T1W and intermediate to high signal on T2W image. The increased T2 signal has been attributed to the abundant myxoid stroma, which gives it a multiseptated cyst-like appearance on T2W. On post-contrast, intense enhancement is generally seen. The major differentials include vaginal vascular malformations and polypoidal myomas.

The treatment of RMS is multimodal, with chemotherapy combined with surgery and/or radiotherapy. VAC is the most commonly used regimen. The surgical procedure depends

on the patient's age and the extent of tumor invasion and varies from polypectomy and wide local excision to radical hysterectomy.[8] The survival rate of vaginal and cervical lesions has been reported to be 60–96%.[10] The presence of distant metastasis at the diagnosis, quality of surgery, and poor response to pre-operative chemotherapy is strongly associated with poor prognosis.

CONCLUSION

Thus, MRI is a useful modality in the evaluation of vaginal tumors. Characteristic MRI findings of primary choriocarcinoma are T1 hyperintense rim and peripheral enhancement and that of embryonal RMS are hyperintense, cystic-like appearance on T2, and intense post-contrast enhancement.

TEACHING POINTS

1. Primary choriocarcinoma and embryonal rhabdomyosarcoma are examples of rare vaginal neoplasms.
2. Primary choriocarcinomas of vagina occur in women of reproductive age group and show peripheral enhancement on post-contrast study.
3. Embryonal rhabdomyosarcomas of vagina occurs in pediatric population and appear hyperintense on T2 and show moderate to intense post-contrast enhancement.

MCQs

1. Which of the following can present as a polypoidal lesion of the vagina
   a. Endometrial hyperplasia
   b. Embryonal rhabdomyosarcoma
   c. Intramural fibroid
   d. Cervicitis

Answer Key: b

2. Which of the following is not an imaging feature of primary extrauterine choriocarcinoma?
   a. T1 hyperintense rim
   b. Peripheral enhancement
   c. Heterogeneous T2 signal
   d. Cyst-like appearance

Answer Key: d

3. Which of the following is unlikely in vaginal rhabdomyosarcoma?
   a. Cyst-like appearance
   b. Tortuous vessels coursing within the lesion
   c. T2 hypointensity
   d. T1 isointensity

Answer Key: c

Ethical approval

The study was approved by the Ethical Review Committee of our Institute.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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