

Oncology

Rhabdomyosarcoma of the prostate with bladder and urethral infiltration: A case report

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ABSTRACT

Rhabdomyosarcoma of the prostate is rarely found in adults compared to rhabdomyosarcoma in other body regions. In early stage of the tumor, the symptoms are similar to other genitourinary problems, such as dysuria, urinary retention, lower abdominal pain and prostate enlargement. This condition often leads to misdiagnosis and treatment delay because of the tumor's rapid growth. Asides from the histopathological examination, imaging had an important role in determining the diagnosis. MRI is very useful and more preferred than other imaging modalities in determining the diagnosis.

Introduction

Rhabdomyosarcoma is the most common soft tissue malignancy in children.¹ However, this tumor is very rare in adults.^{1,2} On physical examination, rhabdomyosarcoma has similar symptoms as other genitourinary problem in early stage of the tumor, such as dysuria, urinary retention and lower abdominal pain. However, the rapid growth of the tumor and normal level of PSA can be the key findings in determining the diagnosis.²

Imaging modalities, such as MRI, have an important role in the diagnostic process because of the capabilities to evaluate the characteristic of the tumor and the possibility of malignancy. Here in this report, we present a young adult male with chief complaint of difficulty to urinate and the role of MRI in determining the rhabdomyosarcoma of the prostate.

Case illustration

A 32-year old male came to the local hospital complaining of difficulty to urinate. Patient underwent urinary catheterization and was diagnosed with prostate enlargement. After a few months, he came back to the hospital with lump in lower abdomen. Contrast-enhanced abdominal CT in October 2018 showed prostatic mass sized $6 \times 8 \times 13$ cm.

The patient was then referred to urology center in our hospital. On admission, the patient had lower abdominal pain and fever. He also had

constipation, but no bowel dilatation found on abdominal radiograph. Contrast-enhanced abdominal MR in January 2019 showed prostatic mass sized $12 \times 13 \times 15$ cm which appeared as iso-hypointense in T1WI, hyperintense T2WI and hyperintense in DWI sequence (Fig. 1) with bone metastases in L5 and right ischium (Fig. 2). The patient was then underwent transrectal biopsy procedure and the result confirmed the prostatic rhabdomyosarcoma (Fig. 3).

After prolonged antibiotic treatment, leukocytosis persisted and procalcitonin serum was still elevated. Chemoradiation was initially planned but the patient refused medication and was discharged by his own request.

Discussion

Rhabdomyosarcoma of the prostate is characterized by a high degree of aggressiveness and rapid local growth. This tumor also can form large pelvic masses, causing urethral obstruction and systemic spread.² The prognosis of this tumor is poor, with a five-year survival rate 30%–35% for all rhabdomyosarcomas in adult individuals.³ MRI is the imaging modality of choice to evaluate the tumor extension and involvement of adjacent structures.³

Rhabdomyosarcoma on MRI appears as ill-defined mass originating from central region of the prostate, hypointense on T1W, hyperintense on T2W, hyperintense (restricted diffusion) on DWI, and enhanced heterogeneously on post-gadolinium T1W.^{1,3,4} Central necrosis is usually present because sarcomas have rapid growth.² All of these findings

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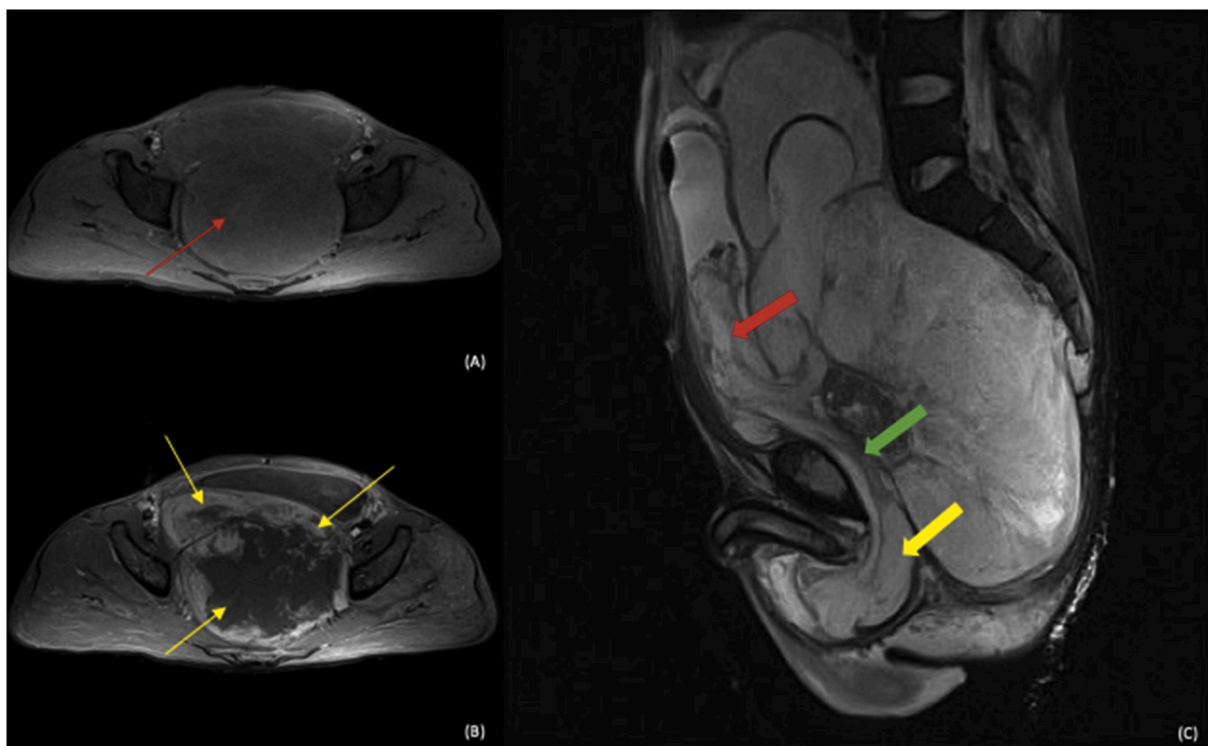


Fig. 1. Abdominal T1W and T2W fat saturation MRI. Fig. 1A showed non-contrast T1W image of solid mass with necrotic component (thin red arrow) which enhanced after contrast administration (thin yellow arrow) in Fig. 1B. Fig. 1C showed hyperintense T2W image of prostatic mass with infiltration to the bladder (thick red arrow) and urethra (thick yellow arrow) through prostatic part of urethra (thick green arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

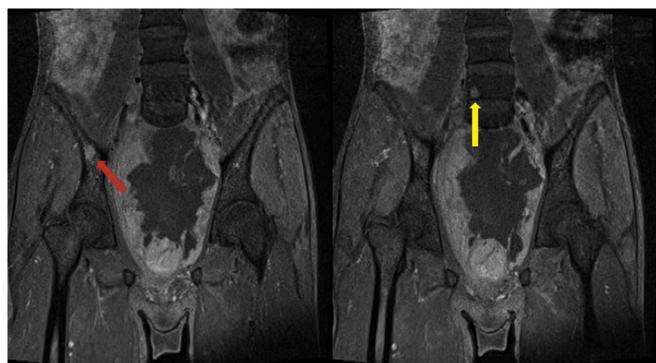


Fig. 2. Bone Metastases. Coronal contrast-enhanced T1W showed metastases on right ischium (red arrow) and vertebra L5 (yellow arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

were present in our case. Heterogeneous signal intensity representing hemorrhagic foci may also present.³

A partial or complete T2WI-hypointense pseudocapsule with heterogeneous enhancement on T1W post-contrast can be seen – representing interface between tumor and adjacent compressed periprostatic fat.^{1,2} On CT, it appears as ill-defined mass with heterogeneously enhancing solid part and non-enhancing cystic (necrotic) areas.²⁻⁴

Although the final diagnosis should be made based on histopathologic examination,² several imaging features may help to distinguish various prostatic cancers. Non-Hodgkin lymphoma of the prostate is hypointense on T2W MRI. Adenocarcinoma is rarely confused with rhabdomyosarcoma, since the latter usually affects young children and adolescents. In adults, differentiating rhabdomyosarcoma from adenocarcinoma could be very difficult because both have heterogeneous appearance.^{1,2} However, non-mucinous adenocarcinoma is usually hypointense on T2W MRI. Mucinous adenocarcinoma is hyperintense on T2WI, but it does not demonstrate abnormalities at DWI MRI and MRS.⁵ Characteristics of bone metastases can help in differentiating rhabdomyosarcomas and adenocarcinomas – bone metastases in rhabdomyosarcomas are predominantly osteolytic and diffusely disseminated, while adenocarcinomas have osteoblastic lesions concentrating in axial

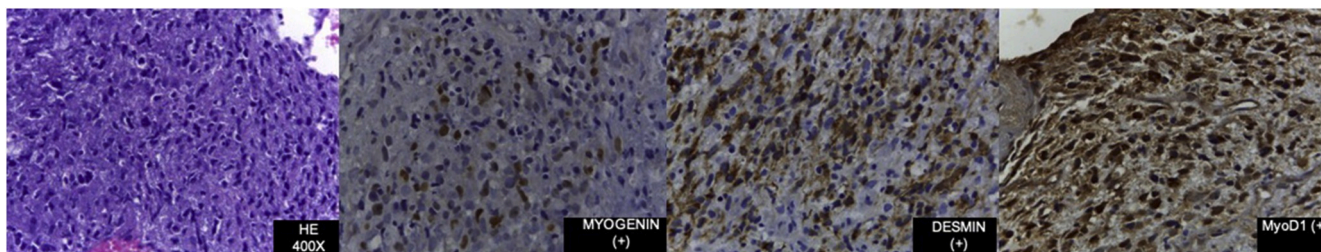


Fig. 3. Positive HE and immunostaining of myogenin, desmin and myoD1.

skeleton.³

MRI findings in our patient were consistent with rhabdomyosarcoma of the prostate described in existing literatures. Moreover, there was also infiltration of the mass into bladder and urethra through the prostatic portion of urethra. This infiltration caused bladder outlet obstruction and urinary retention. Compression of the rectum and distal colon, with or without tumor infiltration could cause constipation in the patient. The bone metastasis findings were also consistent with other studies.⁴

Conclusion

Rhabdomyosarcoma of the prostate in young adults is very rare and has poor prognosis. Radiologist, as well as clinicians, should be aware the possibility of prostate malignancy in young male adults presenting with urinary retention. Routine imaging might be needed in the cases of young male adults with urinary retention to avoid late diagnosis and delay treatment. MRI is the choice for evaluating the tumor extension and its characteristics. Rhabdomyosarcoma should be included in the

differential diagnosis if there's a lesion in the prostate without elevated PSA level.

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