Case Report

Embryonal rhabdomyosarcoma of the prostate in a young Sudanese male: A rare case report

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ABSTRACT

Rhabdomyosarcoma (RMS) is an aggressive soft-tissue cancer. Embryonal RMS (ERMS) is common in when originating in the prostate, usually carrying a poor prognosis. A 15-year-old male from Sudan presented with acute urinary retention. Examination and biopsy confirmed ERMS of the prostate with metastasis to the lungs and pelvic lymph nodes. Despite palliative surgery, transurethral resection of the prostate, and chemotherapy, the patient passed away 6 months later due to chemotherapy complications. This is the first documented case of prostatic ERMS in Sudan. The case underscores the malignancy's aggressive nature and the critical need for early detection, accurate diagnosis, and multidisciplinary care to improve survival rates.

Key words: Embryonal rhabdomyosarcoma, Prostate, Sudan

Rhabdomyosarcoma (RMS) is an uncommon and aggressive cancerous soft-tissue tumor that develops from skeletal muscle progenitor cells. While several subtypes have been identified [1], the two primary ones are alveolar RMS and Embryonal RMS (ERMS). ERMS is the most frequently occurring subtype, accounting for about 53% of cases, and it mainly affects children and adolescents [2]. However, prostate–originating ERMS is rare, with most cases occurring in the pediatric population, but it is rare and aggressive in adolescents with high clinical suspicion for atypical urinary symptoms, and better medical documentation in resource–limited settings is essential for earlier detection. The symptoms of ERMS are usually associated with the tumor's local growth. As the tumor enlarges, it puts pressure on surrounding structures, causing symptoms that vary based on the tumor's location. For example, in cases where the prostate is involved, patients might experience urinary retention, hematuria, or dysuria. The rapid onset of these symptoms often indicates the tumor's aggressive nature [3]. Due to the high likelihood of local spread and distant metastasis, the prognosis for patients with this condition tends to be poor, especially when metastasis is present at the time of diagnosis. Treatment typically involves a combination of surgery, chemotherapy, and, in some instances, radiotherapy [4].

This case report presents a 15-year-old male who visited the urology clinic with acute urinary retention and was diagnosed with ERMS of the prostate.

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CASE REPORT

A 15-year-old male presented to the urology clinic with a complaint of urinary retention lasting for 1 week. He has no significant medical history and is otherwise healthy. He reported being unable to urinate for the past week, along with increasing discomfort and pressure in his lower abdomen. He denied any history of hematuria or dysuria. In addition, he did not experience any symptoms like weight loss, fever, or urinary tract infections. The urinary retention began suddenly and worsened progressively over the next week, which led him to seek medical help.

On examination, the patient seemed unwell, exhibiting mild pallor but no signs of jaundice or severe discomfort. Vital signs were normal. Tenderness was noted over the suprapubic area, and a digital rectal examination revealed a prostate that was enlarged, firm, and had irregular borders with several palpable nodules. There was no evidence of palpable inguinal lymphadenopathy.

Laboratory investigations, including renal function tests (serum creatinine, blood urea nitrogen), urinalysis, complete blood count, and prostate-specific antigen levels, were within normal limits. These findings indicated no evidence of renal impairment, urinary tract infection, or hematologic abnormalities.

Abdominal ultrasound revealed a significantly enlarged prostate with a volume of 128 cm^3 and noted increased vascularity. No other abnormalities detected. Computed tomography (CT) urography imaging of the

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pelvis showed a heterogeneous prostatic mass measuring 69 × 88 × 70 mm in the anterior-posterior, cranial-caudal, and transverse diameters, respectively (Fig. 1). The mass had irregular outlines and areas of degeneration, suggestive of aggressive disease. In addition, multiple pelvic lymph nodes were enlarged, indicating regional metastasis. Furthermore, two pulmonary nodules were observed on chest CT, with the largest measuring 22 × 14 mm in diameter, consistent with metastatic deposits of a malignant disease.

Standard antibiotic prophylaxis was administered, and two units of blood were prepared for potential transfusion. A pre-operative transfusion was carried out to optimize the patient's condition. The patient underwent a true cut needle biopsy. Microscopic analysis revealed a proliferation of round and spindle-shaped cells in a myxoid stroma, with no normal prostatic tissue present. Immunohistochemical staining for specific markers such as desmin and myogenin was unavailable, so we relied solely on hematoxylin and Eosin staining, which was deemed sufficient for diagnostic purposes in this case (Fig. 2). Histopathological examination of the prostatic tissue confirmed the diagnosis of ERMS (Fig. 2).

The decision was made to proceed with a palliative transurethral resection of the prostate (TURP) due to the patient's urinary retention, which was not relieved by ureteral catheterization. General anesthesia (GA) was administered for the procedure. Cystoscopy revealed a large trilobar prostatic mass with multiple nodules. The mass was encroaching on the urethra and protruding into the urinary bladder (UB) beyond the trigone. The ureteric orifices were not visible, and no additional bladder masses were identified. A tunneling TURP was performed, creating two troughs at the 5 and 7 o'clock positions. The mass was not amenable to complete endoscopic resection; therefore, the primary objective of the procedure was to relieve urinary retention. A three-way catheter was smoothly inserted, and continuous bladder irrigation was initiated. Bladder irrigation was maintained for 24 h. The patient received standard post-operative care, with no complications reported. The patient was referred to an oncologist while catheterized to continue chemotherapy cycles.

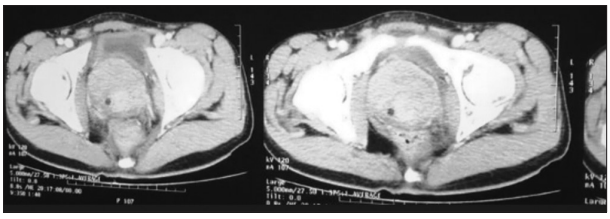

Figure 1: Computed tomography urography show prostate gland replaced by a large mass, mostly rhabdomyosarcoma

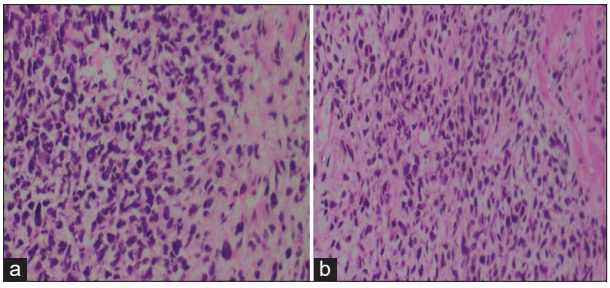

Figure 2: (a) Histopathology slides of the patient (b) Histopathology picture

The early post-operative phase was uneventful, the catheter was removed on day 3, and the patient was able to void satisfactorily, patient left the hospital on the 4th post-operative day. On evaluation 2 months later, the patient's overall condition was deemed satisfactory. Then the patient was referred to the oncology department. The medical oncologist decided to start chemotherapy and received eight cycles. The patient died after 6 months of diagnosis in the oncology department due to anemic heart failure and worsening renal function.

DISCUSSION

ERMS is a malignant soft-tissue tumor predominantly affecting children, and it commonly presents in the head and neck region, genitourinary tract, and extremities [5], with the genitourinary subtype often posing significant clinical challenges due to its aggressive nature and complex anatomical involvement. In this case, the patient presented with urinary retention secondary to a large prostatic mass. This is consistent with the known behavior of genitourinary ERMS, which frequently leads to obstructive uropathy due to its invasive growth patterns [6].

The diagnosis was confirmed preoperatively by transrectal trucut biopsy, which showed a malignant neoplasm composed of round and spindle cells in myxoid stroma. The tumor cells are moderately pleomorphic with brisk mitosis. No normal prostatic tissue was noted, highlighting the importance of early and accurate histopathological evaluation in managing such cases. Pre-operative preparation, including standard antibiotic prophylaxis and blood transfusion, is crucial to mitigate surgical risks, particularly in pediatric patients who may have a more delicate physiological status. GA was appropriately selected to ensure the patient's comfort and cooperation during the procedure. The cystoscopic findings in this patient revealed a substantial trilobar prostatic mass with multiple nodules extending into the UB and encroaching upon the urethra. This extensive involvement underscores the aggressive nature of ERMS and its capacity for local invasion, which complicates surgical management [7]. Despite the complexity, the creation of troughs at the 5 and 7 o'clock positions via tunneling TURP provided necessary relief from urinary retention, although complete resection was not feasible endoscopically. The use of a three-way catheter and subsequent bladder irrigation are standard post-operative measures to prevent clot formation and ensure unobstructed urinary flow. The absence of specific complications in this case highlights the efficacy of these interventions in managing post-operative

outcomes. Following surgery, the patient's referral to oncology for continued chemotherapy cycles is aligned with current treatment protocols for metastatic ERMS [8]. Multimodal therapy, combining surgery, chemotherapy, and sometimes radiation, is essential for improving survival rates and managing metastatic disease [9]. The catheterization during chemotherapy ensures continued urinary drainage, reducing the risk of further complications associated with urinary retention. Despite the multimodal treatment approach, our patient unfortunately passed away after the eighth cycle of chemotherapy, underscoring the aggressive nature and poor prognosis associated with metastatic ERMS [5,7].

To the best of our knowledge, there have been no previously documented cases of ERMS of the prostate in Sudan. This underscores the rarity of the condition both globally and within local contexts, further stressing the importance of early detection and the critical need for awareness in regions with limited medical literature on this type of malignancy.

In summary, this case emphasizes the critical role of multidisciplinary care in managing pediatric ERMS. Early diagnosis, meticulous surgical planning, and comprehensive post-operative care are paramount in improving patient outcomes. Further research and clinical collaboration are needed to enhance therapeutic strategies and support long-term survivorship in pediatric ERMS patients.

CONCLUSION

This case highlights the first reported instance of ERMS of the prostate in a pediatric patient in Sudan. Given the rarity of this malignancy, especially in regions with limited medical documentation, such case reports are critical for increasing awareness and facilitating earlier diagnosis. The aggressive nature of ERMS, along with the presence of metastasis at diagnosis, emphasizes the importance of multidisciplinary management, including timely surgical and oncological interventions. Expanding the literature on rare malignancies like ERMS in Sudan and other underreported regions is essential for improving clinical outcomes and guiding future research.

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