International Journal of Clinical Oncology and Cancer Research
2026, Vol. 11, No. 1, pp. 15–21
https://doi.org/10.11648/j.ijcocr.20261101.12

Case Report

A Pediatric Case of Embryonal Rhabdomyosarcoma of the Bladder: A Case Report and Literature Review

Faye Samba Thiapato[1, *], Fall Mbene[2], Diop Rama Fatou Bintou[3], Kikalulu Kiambote Hamidou[1], Sarr El Hadji Souleymane[3], Seck Aita[2], Dembele Mamadou[1], Diatta Marie Noel[1], Ndiaye Abdoulaye[1]

[1]Urology Departement, Principal Main Hospital of Dakar, Dakar, Senegal

[2]Pediatric Departement, Principal Main Hospital of Dakar, Dakar, Senegal

[3]Anatomo-histopathology Departement, Principal Main Hospital of Dakar, Dakar, Senegal

Abstract

Rhabdomyosarcomas (RMS) are malignant tumors derived embryonically from the mesenchymal tissue that form from the skeletal muscles. It is the most common soft tissue sarcoma in pediatrics. The embryonal mesenchymal subtype is the most common and is often diagnosed in the first decade of life. Treatment of RMS is multimodal including systemic chemotherapy, surgery and radiotherapy. In sub-Saharan Africa, data in pediatric cancers, and on RMS in particular, are rare and limited generaly to case reports. This case aims to report a bladder embryonal rhabdomyosarcoma in a 19-month-old child boy who is diagnosed post mortem. It was referred to the pediatric emergency department for sudden painful complete inability to urinate. On clinical examination, an acute urine retention was diagnosed and transurethral catherisation was established with resultant drainnage of hematic urine. Hemodynamic parameters were unstable, with oxygen saturation at 91%. A painless well-fixed mass of solid appearance was palpable at the hypogastric. Laboratory exams showed an impaired renal function with metabolic acidosis. Urine culture and sensitivity testing revealed a urinary tract infection that isolated klebsiella pneumonia. Emergency ultrasonography of the urinary tract, showed a large, heterogeneous, multilobulated intravesical vegetative mass measuring 60.85 x 35.34 x 42.2mm, responsible of a bilateral stage VI ureterohydronephrosis. Abdominal-pelvic MRI showed a vegetative postero-basal tissue mass invading the entire bladder trigone and classified T3bN0Mx. Bilateral nephrostomy was performed the following day with a medical resuscitation, and antibiotherapy adapted to renal function, was installed. A cystoscopy was performed under general anaesthesia showed a large bladder mass filling almost the entire bladder lumen. The biopsy was done using a monopolar resector. The post-operative event was marked by a cardiorespiratory arrest with failure of all reanimation maneuvers occurred. The histological results the biopsy showed a sarcomatous proliferation of small round or spindle-shaped fusiformed cells with hyperchromatic nuclei and little cytoplasm. Mitotic activity was high. Immunohistochemical analysis showed desmin and myoginin, confirming the diagnosis of embryonal-type rhabdomyosarcoma classified as TNM stage II and ISRG IV.

Keywords

Bladder Cancer, Rhabdomyosarcoma, Embryonal Subtype, Onco-pediatrics

*Corresponding author: thiapatomaleme@gmail.com (Faye Samba Thiapato)

Received: 19 December 2025; **Accepted:** 4 January 2026; **Published:** 23 January 2026

1. Introduction

Rhabdomyosarcomas (RMS) are malignant tumors derived embryonically from the mesenchymal tissue that form from the skeletal muscles [1]. It is the most common soft tissue sarcoma in paediatrics, with around 15-20% of cases originating from the Genitourinary (GU) tract [2]. Several histopathological subtypes of RMS are currently recognized, among which the embryonal mesenchymal subtype, accounts for around 70% of childhood RMS, it is the most common and is often diagnosed in the first decade of life [2]. Age of diagnosis is an important risk factor, age < 1 year or >10 years has an event free survival (EFS) of 53% compared to 71% for those aged 1–9 years [3]. About three quarters of all GU RMS will be diagnosed in the first 5 years of life, with a male predominance [4]. The underlying reason for the gender bias is unknown, but it is possible that most of these tumors are actually prostate in origin as these tumors are often very large at presentation and determining organ of origin can be difficult [5]. Therapy consists of a multidisciplinary treatment approach including chemotherapy, radiation therapy and/or surgery [2]. The optimal local treatment remains unclear as radiotherapy and surgery may both have severe side effects. Surgery might lead to loss of organs and organ function or mutilation. Radiation therapy might induce secondary malignancies after years and in pelvic tumors a dysfunction of growth plates might occur in the radiation field [6] In sub-Saharan Africa, data in pediatric cancers, and on RMS in particular, are rare and limited to case reports [7]. Informations are more scarce, there are few statistics and few cancer registries. Late diagnoses persist with high percentages of advanced stage disease.

We report a case of embryonal rhabdomyosarcoma in a 19-month-old infant complicated by acute obstructive renal failure and a comprehensive literature review.

2. Observation

A 19-month-old infant, with history of parental consanguinity, was referred to the pediatric emergency department for sudden painful complete inability to urinate associated with lower abdominal pain. On clinical examination, he was agitated with diaphoresis, he had a tensed distended tender lower abdomen, reaching the umbilicus with dullness on percussion. Acute urine retention was diagnosed and transurethral catherisation was established with resultant drainnage of hematic urine. This condition was preceded by dysuria which h ad been present for about a month, prompting the parents to consult a health facility where a diagnosis of tight phimosis was made. Circumcision was performed the same day. Three days later, he was unable to urinate at all, which led to his referral to our facility. The rest of the examination showed male external genitalia, with sutures present at the glandulopreputial sulcus, and the testes palpated in the scrotum. Hospitalization was indicated for further exploration. Clinical examination after bladder drainnage and clinical stability revealed a fairly good general state, pale conjuntiva, anicteric sclerae and discrete bilateral edema of the lower limbs. His hemodynamic and anthropometric constants are summarized in Table 1.

Table 1. *Patient's hemodynamic and anthropometric constants.*

Constants	Values/ Units
Body temperature	36.5 °C
Blood pressure	120/ 100mmHg
Heart Rate	120 Bpm
Respiratory Rate	20 Cpm
Diuresis	200 Cc/ 24H
Capillary Dextro	1.17 g/dL
Saturation of 02	91%
Head circumference	48 cm
Height	86 cm
Weight	9450 g

A painless firm well-fixed mass of solid appearance (Figure 1) was palpable at the hypogastric level with no palpable lymph nodes, the digestive and pulmonary systems were normal.

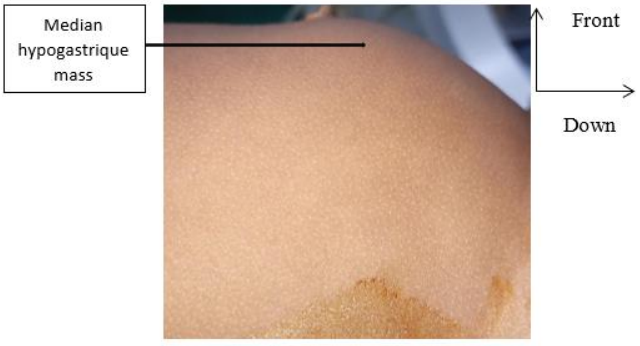


Figure 1. *Hypogastric mass [IMAGE_HPD].*

Laboratory exams showed an impaired renal funtion with metabolic acidosis. The results of the analyses are reported in Table 2. Urine culture and sensittivity testing revealed a urinary tract infection that isolated klebsiella pneumonea a broad-spectrum beta-lactamase sensitive to carbapenems and Amikacin.

Table 2. Results of the laboratory test.

Constants	Values / Units
Hemoglobin level	7.1 g/dL
hematocrit	20.7%
Creatinine level	43.8 mg/L
Blood urea	1.17 g/L
Kalemia	4 mEq/l
Natremia	115 mEq/l
Blood pH	6.98
pCO_2	29mmHg
pO_2	62mmHg
Bicarbonate (HCO_3)	7mmol/L
Hight bases	-23.4mmol/L

Emergency ultrasonography of the urinary tract, showed a large, heterogeneous, multilobulated intravesical vegetative mass measuring 60.85 x 35.34 x 42.2mm, extending from the trigonal region to the posterior wall of the bladder, with some mass effet responsible of bilateral stage VI ureterohydronephrosis (Figure 2).

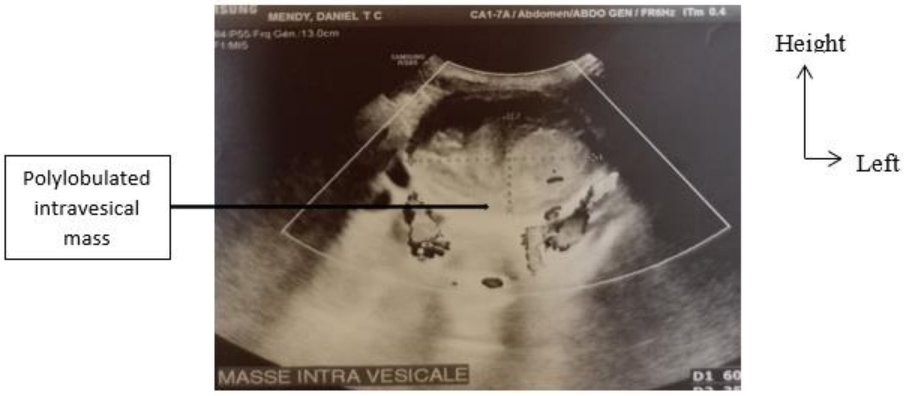


Figure 2. Bladder mass seen on echography [IMAGE_HPD].

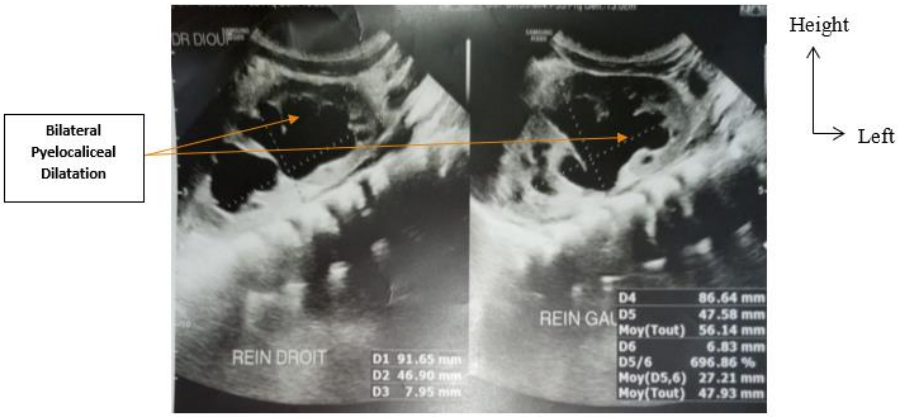


Figure 3. Bilateral Pyelocaliceal Dilatation on echography [Image HPD].

Bilateral nephrostomy was indicated and performed the following day in the operating room under fluoroscopy. Medical resuscitation, including hydroelectric rehydration, iso rhesus group transfusion and imipenem-based antibiotic therapy adapted to renal function, was installed.

On the third day of hospitalization, the general state of the patient had improved markedly, with O_2 saturation at 99% at ambient room air. The patient's laboratory follow-up revealed creatinine level was at 21.7 mg/l, the blood urea 1.0 g/L and hemoglobin level 9.1 g/dl, and Arterial blood gases were normal. Abdominal-pelvic MRI showed a vegetative postero-basal tissue mass invading the entire bladder trigone and classified T3bN0Mx (Figure 3).

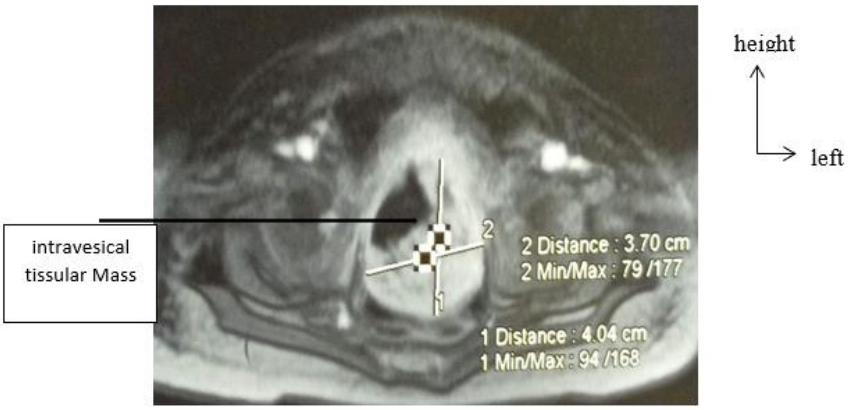
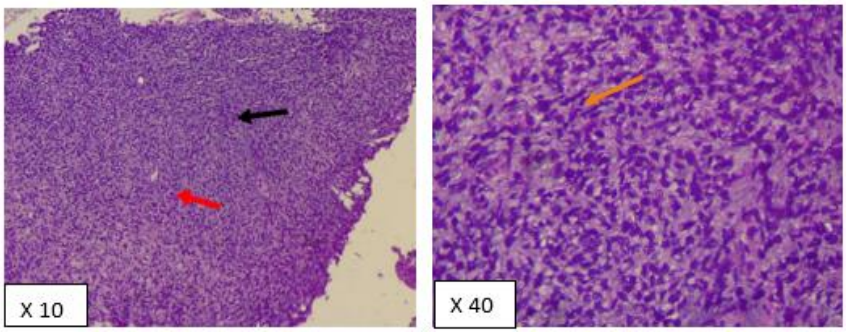


Figure 4. *Intravesical aspect of the mass seen at MRI [IMAGE_HPD].*

A cystoscopy was performed under general anaesthesia on the fourth day of hospitalization that permitted to visualise a large bladder mass filling almost the entire bladder lumen, with a very wide base implantation, taking the trigone and the anterolateral surfaces of the bladder. The biopsy was performed using a monopolar resector during at the same operating time.

The immediate post-operative event was marked by cardiorespiratory arrest on the operative table at the end of the procedure. The patient was successfully reanimated and transferred to the intensive care unit, intubated and ventilated. Another cardiopulmonary arrest with failure of all reanimation maneuvers occurred on day two postoperatively.

The histological results of the post-mortem biopsy showed a sarcomatous proliferation of small round or spindle-shaped fusiformed cells with hyperchromatic nuclei and little cytoplasm. Mitotic activity was high. The stroma was inflammatory (Figure 4).



Arrows: Red= rond cells; black= fusiforme cells; Orange=atypical nucleares

Figure 5. *Microscopic Aspect of ERMS [IMAGE_HPD].*

Immunohistochemical analysis showed desmin and myoginin, confirming the diagnosis of embryonal-type rhabdomyosarcoma classified as TNM stage II and ISRG IV (Figure 5).

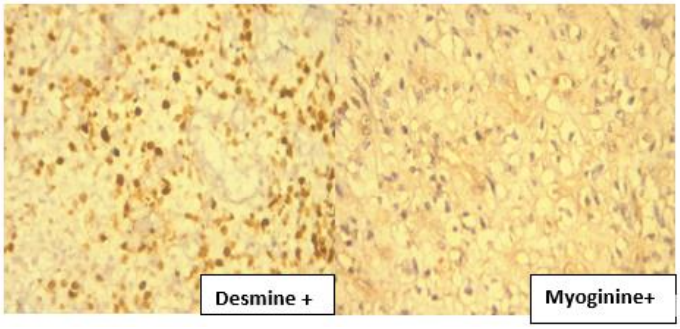


Figure 6. *Immunohistochemical reactions of Desmine and Myoginine (X40) [IMAGE_HPD].*

Ethical Approbation: Ethical approval has been obtained from our hospital's ethics committee.

3. Discussion

Rhabdomyosarcomas (RMS) are the most common soft-tissue sarcoma in paediatrics, with around 15-25% of cases located in the urogenital system [8]. The bladder and prostate are the most common primary location, accounting for around 5% of all RMS cases [9]. RMS arising from these sites are generally associated with a higher rate of complications due to treatment, given their location in the pelvis [10]. According to the 2020 World Health Organization update on the classification of soft tissue tumors, RMS are divided into four histologic subtypes–embryonal, alveolar, spindle cell/sclerosing, and pleomorphic [11]. Embryonal RMS, accounts for around 70% of pediatric RMS, it is the most common subtype and is often diagnosed in the first decade of life [6]. The same histological subtype was found in our patient. The incidence of RMS is slightly higher in European countries compared to the USA based on a report that included 59 cancer registries from 19 European countries [12, 13]. In sub-Saharan Africa, the incidence of rhabdomyosarcoma is highly variable, as shown by a study of 16 populations registries within the African Network of Cancer Registries, which estimated the incidence rate of pediatric rhabdomyosarcoma at 0.6 to 8.6 per million population in West Africa, compared with 2.4 to 2.5 per million in Southern Africa and 2.6 to 16.3 per million in East Africa [14]. Genitourinary RMS have a bimodal age distribution. Peak incidence occurs in the first 2 years of life (>50% of cases, mainly embryonal or botryoid RMS), with another peak occurring in adolescence (mainly alveolar RMS) [1]. Our 19-month-old patient was in the first peak, and the embryonic subtype is classic for this age group. Age of diagnosis and histology subtype are the two prognostic factors for RMS. Whatever the tumor stage at diagnosis and whatever the treatment, RMS are tumors with poor prognosis, with a survival rate of 3 to 19 months after treatment initiation [5]. Metabolic complications in our patient precipitated his vital prognosis. Lower urinary tract symptoms and/or macroscopic hematuria associated with a palpable hypogastric mass are the main clinical signs [15]. In our patient, dysuria was the first sign, followed by acute retention of urine with clotting total hematuria. Clinically, the mass was palpable and occupied almost the entire bladder lumen. This situation already indicated an advanced stage of the disease. Ultrasound is the most commonly performed initial examination, due to its safety and accessibility [16]. If malignancy is suspected, pelvic Computed Tomography (CT) or, preferably, magnetic resonance imaging (MRI) is performed to better characterize the location and extent of the disease. Abdominopelvic ultrasound, followed by uro-MRI, confirmed the diagnosis of bladder tumor in our patient. They also showed the extent of the tumor, the invasion of neighbouring organs and the impact on the upper urinary tract with the presence of bilateral stage IV ureterohydronephosis. There is a growing body of evidence suggesting that metabolic imaging can be used such as Fluorodeoxy-D-Glucose Positron emission tomography (FDG -PET) can be used in the staging of RMS [17]. A recent systematic review of the diagnostic accuracy and clinical effectiveness of metabolic imaging in pediatric RMS showed that the sensitivity and specificity of PET-CT or PET for lymph node involvement were respectively 80%-100% and 89%-100%, compared to conventional imaging which has a sensitivity of 67%-86% and specificity of 90%-100% [18]. Tissue biopsy is often required usually by endoscopic resection or during cystoscopy as imaging alone cannot predict histological subtypes [17, 19]. Cystoscopy with biopsy under general anaesthesia confirmed the histological nature of the lesion in our patient, coupled with immunohistochemistry analysis. An emergency nephrostomy was performed for an acute obstructive renal failure and with impossibility of resecting the tumor. Risk stratification for RMS is based on both a pre-treatment staging system (TNM) and a surgical/pathological clinical grouping system established by the IRSG [20]. The pre-therapeutic TNM classification system is based on tumor size, degree of invasion, lymph node status and tumor site of origin. Locations with good Prognosis for genotourinary RMS are paratesticular, vulvovaginal and uterine, while bladder and prostate location have poor prognosis. The post-therapeutic classification system focuses on the presence of residual tumor [17]. The main therapeutic objective in vesico-prostatic RMS is to ensure healing with maximum preservation of the organs involved, avoiding mutilating interventions associated with an extremely high morbidity [19]. The therapeutic approach includes total or partial cystectomy, transurethral resection of the bladder, chemotherapy and radiotherapy [6]. The tumoral volume and the overal condition of our patient did not permit the initiation of a therapeutic option at that time. In cases of localized RMS, the gold standard is radical cystectomy combined with bilateral lymph node dissection [6, 8]. This radical surgery may be preceded by neoadjuvant chemotherapy. Adjuvant radiotherapy in combination with surgery has been shown excellent outcomes in cases of embryonal bladder RMS in children. Unfortunately, the death of our patient prior to the histologic results did not permit the initiation of any therapeutic strategy. Favorable prognostic factors in bladder RMS are absence of metastasis, embryonal histology, tumor diameter less than 5 cm, and extirpability [2]. In the case reported by Tembely A et al [7], resectability was a very important favorable prognostic factor. In our patient, the locally advanced stage of the disease associated with metabolic complications were the poor prognostic factors.

4. Conclusion

Embryonal rhabdomyosarcoma is a malignant soft tissue

neoplasm from straited muscle fibers. The prognosis remain poor. In our case, the locally advanced stage and metabolic disorders were the poor prognostic factors that precipitated the patient's death. There are many causes of urinary disorders in the lower urinary tract in boys, ranging from simple phimosis to potentially fatal neoplasia. This case perfectly illustrates the importance of rigorously investigating these urinary signs as early as possible by ultrasound of the urinary tract. It remains available, accessible and reproducible despite our context of developing-country. The development of endoscopy in paediatric urology will also be a springboard in the fight against paediatrics urogenital cancers in our developing countries.

Abbreviations

RMS	Rhabdomyosarcomas
MRI	Magnetic Resonance Imagery
TNM	Tumor Node and Metastasis
GU	Genitourinary
ISRG	Intergroup Rhabdomyosarcoma Study
HPD	Hospital Principal of Dakar
CT	Computed Tomography
FDG -PET	Fluorodeoxy-D-Glucose Positron Emission Tomography
EFS	Event Free Survival
PET-CT	Positron Emission Tomography-Computed Tomography

Aknowledgments

To Dr Roselyne Guylene SENA for proofreading the final English version of this article.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] Leaphart C, Rodeberg D: Pediatric surgical oncology: management of rhabdomyosarcoma. *Surg Oncol.* 2007; 16(3): 173–85. https://doi.org/10.1016/j.suronc.2007.07.003

[2] Castle JT, Levy BE, Allison DB, Rodeberg DA, Rellinger EJ. Pediatric Rhabdomyosarcomas of the Genitourinary Tract. Cancers (Basel). 2023 May 22; 15(10): 2864. https://doi.org/10.3390/cancers15102864

[3] Joshi D, Anderson JR, Paidas C, Breneman J, Parham DM, Crist W. Age is an independent prognostic factor in rhabdomyosarcoma: a report from the soft tissue sarcoma committee of the Children's Oncology Group. Pediatr Blood Cancer. 2004; 42(1): 64–73. https://doi.org/10.1002/pbc.10441

[4] Ferrer FA, Isakoff M, Koyle MA. Bladder/prostate rhabdomyosarcoma: past, present and future. J Urol. 2006; 176(4): 1283–91. https://doi.org/10.1016/j.juro.2006.06.019

[5] Rodeberg DA, Anderson JR, Arndt CA, et al. Comparison of outcomes based on treatment algorithms for rhabdomyosarcoma of the bladder/prostate: combined results from the Children's Oncology Group, German Cooperative Soft Tissue Sarcoma Study, Italian Cooperative Group, and International Society of Pediatric Oncology Malignant Mesenchymal Tumors Committee. Int J Cancer. 2011; 128(5): 1232-1239. https://doi.org/10.1002/ijc.25444

[6] Fuchs J, Paulsen F, Bleif M et al. Conservative surgery with combined high dose rate brachytherapy for patients suffering from genitourinary and perianal rhabdomyosarcoma. Radiother Oncol (2016), http://dx.doi.org/10.1016/j.radonc.2016.10.010

[7] Tembely A, Diakite ML, Berthe HJG, et al. Vesical rhabdomyosarcoma: a case study from the Urology Department at Point G University Hospital. Mali Med. 2010; 25(3): 49–52. https://www.bibliosante.ml/handle/123456789/3387

[8] Arndt C, Rodeberg D, Breitfeld PP, et al. Does bladder preservation (as a surgical principle) lead to retaining bladder function in bladder/prostate rhabdomyosarcoma? Results from intergroup rhabdomyosarcoma study iv. J Urol. 2004 Jun; 171(6 Pt 1): 2396-403. https://doi.org/10.1097/01.ju.0000127752.41749.a4

[9] Dasgupta R, Rodeberg DA. Update on rhabdomyosarcoma. Semin Pediatr Surg. 2012 Feb; 21(1): 68-78. https://doi.org/10.1053/j.sempedsurg.2011.10.007

[10] Buszek SM, Ludmir EB, Grosshans DR, et al. Patterns of failure and toxicity profile following proton beam therapy for pediatric bladder and prostate rhabdomyosarcoma. Pediatr Blood Cancer. 2019 Nov; 66(11): e27952. https://doi.org/10.1002/pbc.27952

[11] Choi J. H., Ro J. Y. The 2020 WHO Classification of Tumors of Bone: An Updated Review. Adv. Anat. Pathol. 2021; 28: 119–138. https://doi.org/10.1097/PAP.0000000000000293

[12] Li J, Thompson TD, Miller JW, et al. Cancer incidence among children and adolescents in the United States, 2001-2003. Pediatrics. 2008 Jun; 121(6): e1470-7. https://doi.org/10.1542/peds.2007-2964

[13] Pastore G, Peris-Bonet R, Carli M, et al. Childhood soft tissue sarcomas incidence and survival in European children (1978-1997): report from the Automated Childhood Cancer Information System project. Eur J Cancer. 2006 Sep; 42(13): 2136-49. https://doi.org/10.1016/j.ejca.2006.05.016

[14] Stefan C, Bray F, Ferlay J, et al. Cancer of childhood in sub-Saharan Africa. Ecancermedicalscience. 2017 Jul 28; 11: 755. https://doi.org/10.3332/ecancer.2017.755

[15] Saltzman AF, Cost NG. Current Treatment of Pediatric Bladder and Prostate Rhabdomyosarcoma. Curr Urol Rep. 2018 Feb 22; 19(1): 11. https://doi.org/10.1007/s11934-018-0761-8

[16] Mbeutcha A, Lucca I, Mathieu R, et al. Current Status of Urinary Biomarkers for Detection and Surveillance of Bladder Cancer. Urol Clin North Am. 2016 Feb; 43(1): 47-62. https://doi.org/10.1016/j.ucl.2015.08.005

[17] Harel M, Ferrer FA, Shapiro LH, Makari JH. Future directions in risk stratification and therapy for advanced pediatric genitourinary rhabdomyosarcoma. Urol Oncol. 2016 Feb; 34(2): 103-15. https://doi.org/10.1016/j.urolonc.2015.09.013

[18] Norman G, Fayter D, Lewis-Light K, et al. An emerging evidence base for PET-CT in the management of childhood rhabdomyosarcoma: systematic review. BMJ Open. 2015 Jan 8; 5(1): e006030. https://doi.org/10.1136/bmjopen-2014-006030

[19] Denes FT, Duarte RJ, Cristófani LM, et al. Pediatric genitourinary oncology. Front Pediatr. 2013 Dec 16; 1: 48. https://doi.org/10.3389/fped.2013.00048

[20] Malempati S, Hawkins DS. Rhabdomyosarcoma: review of the Children's Oncology Group (COG) Soft-Tissue Sarcoma Committee experience and rationale for current COG studies. Pediatr Blood Cancer. 2012 Jul 15; 59(1): 5-10. https://doi.org/10.1002/pbc.24118