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Leiomyoma of the Urinary Bladder in One Year Old Child: A Rare Case Report

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Abstract:

Leiomyoma of the urinary bladder is a rare benign mesenchymal tumor and accounts for less than 0.43% of all bladder tumors. It occurs more frequently in young and middle age women and is extremely rare in children. The present case to the best of our knowledge represents the third reported case of leiomyoma of urinary bladder in children. This case was initially diagnosed on radiological assessment by ultrasound and computed tomography. The histopathological and immunohistochemical findings of the surgical specimen confirmed the diagnosis of leiomyoma. We, herein, present a rare case report of leiomyoma of the urinary bladder in paediatric age

group.

***Key words*:** Leiomyoma, Urinary bladder, Paediatric pathology.

Introduction:

Mesenchymal tumors of the urinary bladder are relatively rare and constitute 1-5% of all bladder tumors. Leiomyoma, though very uncommon, is still the most common benign mesenchymal neoplasm of the urinary bladder and accounts for 0.43% of all the benign bladder tumors.[1, 2] Leiomyoma occurs mainly in young and middle aged females, three times higher than males. It is extremely rare in children aged 0-14 years. About 255 cases of bladder leiomyoma have been previously reported in English literature.[2] The most common presenting complaints are urinary voiding symptoms such as obstruction, irritation and pelvic pain.[3, 4] We describe here a case report of one year old boy with a leiomyoma of the urinary bladder who presented with lower abdominal pain and urinary symptoms like irritation.

Case Presentation

A one year old boy presented with a three week history of urinary symptoms and lower abdominal pain. His urinalysis, complete blood counts and blood chemistry were within normal limits. Ultrasonographic studies showed a well-defined solid and echogenic mass measuring 18cm x 15.5cm x 12.5 cm, arising from the dome of the bladder and protruding into the lumen. Computed Tomography (CT) scan of the abdomen showed a homogenously enhancing mass with smooth borders close to the dome of the urinary bladder (Fig. 1). A biopsy of the mass was taken by cystoscopy.

The biopsy was fixed in formalin and processed for routine staining i.e. Hematoxylin & Eosin (H&E). Microscopic examination revealed a tumor composed of whorls and interlacing fascicles of spindle shaped cells with centrally placed, blunt-ended, cigar- shaped nuclei and eosinophilic cytoplasm, present in a scant hyaline stroma (Fig. 2). There was no evidence of cytological atypia, mitotic activity or necrosis. The tumour cells demonstrated immunoreactivity for Smooth

Muscle Actin (SMA) (Fig. 3A) and Desmin (Fig. 3B) whereas CD117 immunostaining was found negative. Thus the pathological diagnosis of leiomyoma was confirmed. The attached fragmented portions of urinary bladder mucosa showed chronic inflammation only.

Discussion:

Bladder tumors are either epithelial or mesenchymal in origin. Most of them originate from the epithelium, whereas only 1-5% of all bladder tumors arise from the mesenchymal tissues.[5]

Leiomyoma is a rare benign smooth muscle tumor commonly seen in the uterus; however, rarely it has been reported at other sites including gastrointestinal tract, skin and urinary bladder. Despite the bladder being a rare site for leiomyoma, it is still the most common benign bladder tumor (35%).[6]

The etiology of these tumors is still unknown. It is proposed that leiomyomas may arise from chromosomal abnormalities, hormonal imbalances, bladder musculature infection, perivascular inflammation leading to metaplastic transformation of bladder vasculature or dysontogenesis, i-e, embryonic rests of tissue residing in the bladder develop into leiomyoma .[1, 5] These tumors occur most frequently in young and middle aged women (30-60 years) and an association with female hormone estrogen has also been suggested (tumor expression of estrogen receptors).[6] In fact, estrogen receptors have been identified in the leiomyomatous tissues.[5]

Bladder leiomyomas before puberty are very rare in male children. To the best of our knowledge, only two cases have been reported worldwide in the literature since 2011. The first case of bladder leiomyoma in pediatric patients was reported by Mutchler and Gorder in 1972 [7] and the second case was reported by Hui Chen, Zhi Bin Niu, and Yi Yang in 2011.[8] Our case is the third one having this rare finding.

Bladder leiomyomas may be symptomatic or asymptomatic depending upon their location and size. These symptoms range from obstructive symptoms (49%), irritative symptoms (38%), hematuria (11%) or flank pain (2-3%). Larger tumors usually present with irritative symptoms. Depending on the location of these tumors, these can be endovesical (86%), extravesical (11%) and intramural (3%). Of these types, the endovesical type is most likely to be symptomatic because they protrude into the lumen of the bladder causing obstructive, irritative urinary

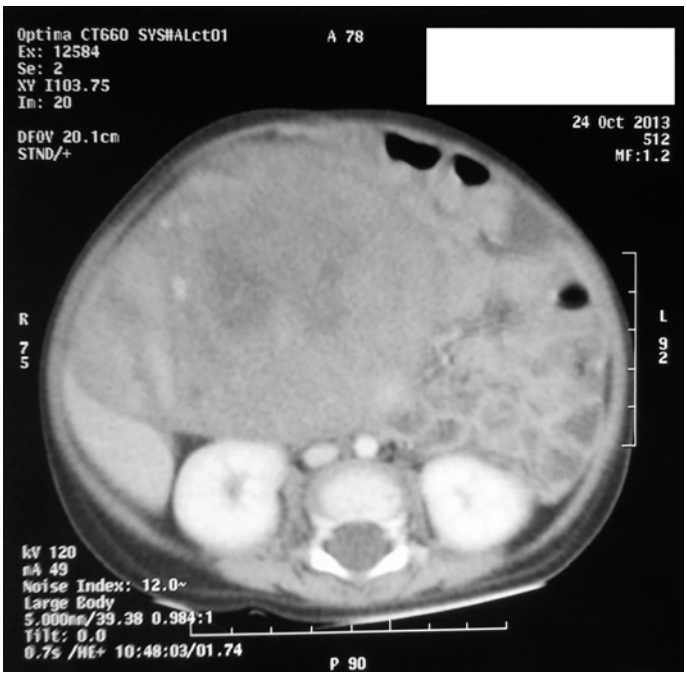

Fig.1. Computed Tomography (CT) scan of the abdomen showing a homogenously enhancing mass with smooth borders in the urinary bladder.

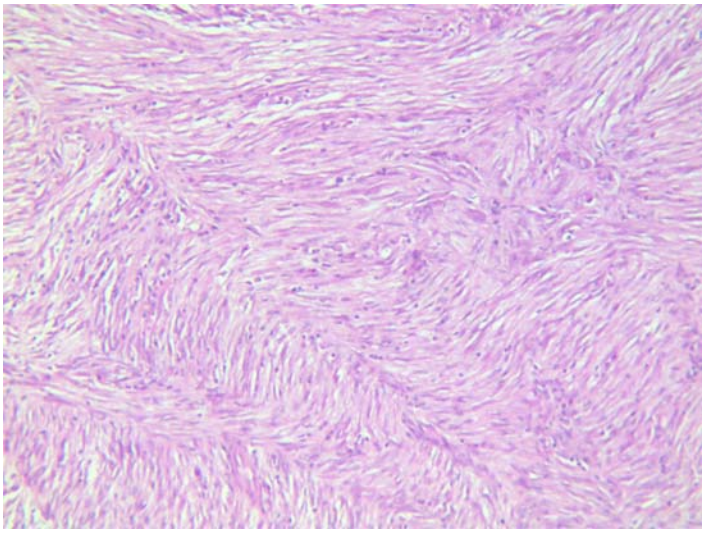

Fig.2. The tumor is composed of whorls and interlacing fascicles of spindle shaped cells in a scant hyaline stroma. H&E staining, 10x.

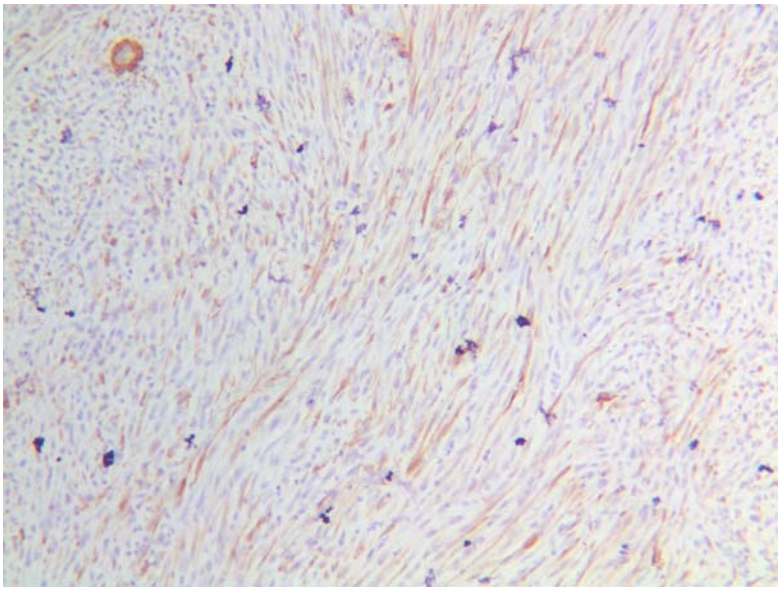

Fig.3. The tumor cells are showing positivity for smooth muscle actin (SMA). IHC staining, 10x.

symptoms or bleeding.[9] In our case also where the tumor was large (18 cm) and endovesical, the patient presented with irritative symptoms and lower abdominal pain.

Initial evaluation of bladder leiomyomas includes Ultrasonography, Computed Tomography (CT), and Magnetic Resonance Imaging (MRI). On all three modalities, leiomyomas either appear smooth, well-circumscribed intramural mass or smooth indentation of the bladder wall.[10] Ultrasound is usually the first procedure done owing to its affordability and availability. The sub-mucosal location with intact mucosa is a characteristic feature of urinary bladder leiomyoma and resembles uterine leiomyoma.[11] No imaging technique can safely exclude malignancy and so histological approach should always be attempted prior to invasive therapeutic procedure and histopathology remains the gold standard in making diagnosis.[12] The same protocol was followed in our case where the lesion was detected on ultrasound and confirmed by histopathology.

Microscopically, leiomyomas of the bladder are non-infiltrative tumor and are composed of whorls of interlacing fascicles of spindle shaped smooth muscle cells separated by connective tissue. The cells have abundant eosinophilic cytoplasm. The nuclei are centrally placed, blunt-ended, cigar- shaped and lacking mitotic activity, atypia and necrosis.[7] The same histologcal

findings were there in our case too.

Immunohistochemistry is a modern technique that aids in confirmation of diagnosis. Most leiomyomas of the bladder exhibit strong diffuse immunoreactivity for smooth muscle actin (SMA) and Desmin. We also found the tumour showing positivity for SMA and Desmin on immunohistochemistry; thus confirming the diagnosis.

Treatment is provided depending on the size and location of the tumor and symptoms of the patients. Symptomatic patients are treated by excision either by transurethral or by open resection through laparotomy.[13] As the tumor was of large size in our patient, it was excised by open resection and a follow up was advised.

Conclusion

Leiomyomas of the urinary bladder are rare benign mesenchymal tumors of the smooth muscle. Ultrasonography, CT and MRI play a very important role in their diagnosis but histopathology remains the gold standard in diagnosing these rare lesions. Immunohistochemistry proves to be a useful tool in confirming the diagnosis.

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