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CASE REPORT

Mature Teratoma Combined with Bladder Stones: A Case Report and Literature Review

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Abstract: Teratoma is neoplasia originating from a germ cell, which usually contains identifiable tissue derived from all three germ cell layers. The presence of teratoma is due to an organ being affected by a tumor, which generally occurs in ovary. Teratoma is also seen occasionally in some extragonadal organs. However, a primary teratoma in the bladder is a rare entity. We hereby present a case of bladder teratoma. A 53-year-old woman whose chief complaints were urinary interruption, pilimiction, and a stone in her urine was diagnosed by cystoscopy and received rehabilitation after tumor resection surgery. She was then symptom-free and further follow-up observation was in progress. We also include a literature review concerning primary bladder teratoma.

Keywords: mature teratoma, dermoid cyst, bladder tumor

Introduction

Teratoma is derived from a primordial germ cell and is the most common germ cell tumor (GCT) in young women.[1] The patients diagnosed with mature teratoma are commonly in their childbearing years, 13–76, with a median age of 30.[2] Nevertheless, mature teratoma also can be found in males with germ cell neoplasm or testicular cancer, although this is quite rare. In most cases, various well-differentiated tissues from one or more of three embryonic germ layers can be found in the neoplasm of mature teratoma, like hair, teeth, bone, skin, fat and sebaceous glands. According to previous reports, the incidence of malignant transformation of mature teratoma is 1–2%, especially in older women, although most are benign.[3]

Most teratoma arise from the ovaries, but they can also occur in some extragonadal organs. Reports of teratoma occurring primarily in the bladder are extremely rare.[2]

Here, we report on a case of a female patient who suffered primary bladder teratoma. She visited the hospital because she kept finding stones in her urine and was diagnosed by cystoscopy and histological confirmation. We also conducted a literature review concerning primary bladder teratoma.

Case Report

A 53-year-old post-menopausal Chinese woman presented with a chief complaint of repeated urinary interruption over a period of 5 years. There was neither a significant personal history nor any family history of malignancy, and she denied having any significant medical history or occupational exposure. According to her recollection, she had a history of pilimiction (hairs in the urine) in 1996 but did not get medical help because there was no reoccurrence thereafter. From June 2019 onwards, she occasionally found some little flaky stones in her urine. She did not attend the hospital until the

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frequent experience of urinary interruption in February 2024. She was diagnosed with a bladder stone after receiving abdominal computed tomography (CT) scan (Figure 1A) and ultrasound examination (Figure 1B). An operation was recommended but she rejected this option and ultrasonic lithotripsy treatment instead. After that, she intermittently found some circular stones with hair (Figure 1C) in her urine; meanwhile, urinary interruption still occurred occasionally.

In July 2024, she attended our hospital for treatment. No remarkable findings were seen on physical examination and a urine test showed: a white blood cell count of 3+, a urinary occult blood count of 3+, and nitrite (NIT) count of 2+. Urine culture was positive for Escherichia coli. Other laboratory tests, a chest X-ray and an electrocardiogram found no obvious abnormalities. We planned a cystoscopy after 3 days of antibiotic therapy. Cystoscopy showed a 2cm×4 cm white, pedunculated neoplasia with hair on the top wall of the bladder as well as a general urinary stone; the neoplasia had a stone on its surface with hair attached; it resembled a needle mushroom or crab leg (Figure 2A and B).

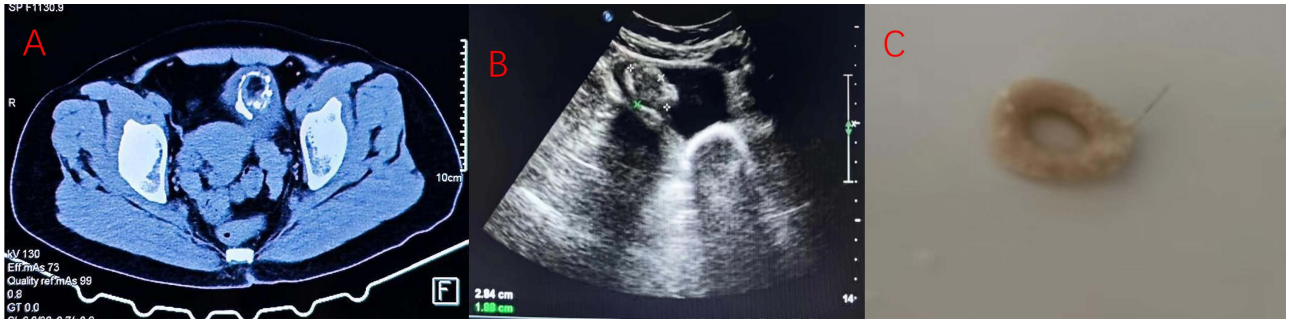

Figure 1 Different imaging examinations showing a stone and entity voided with urine. (**A**) Abdomen non-contrast helical CT shows a circular stone. (**B**) Ultrasonography of the abdomen shows an isoechoic mass with calcification in the bladder. (**C**) A circular stone with black hair (outer ring diameter about 4 cm).

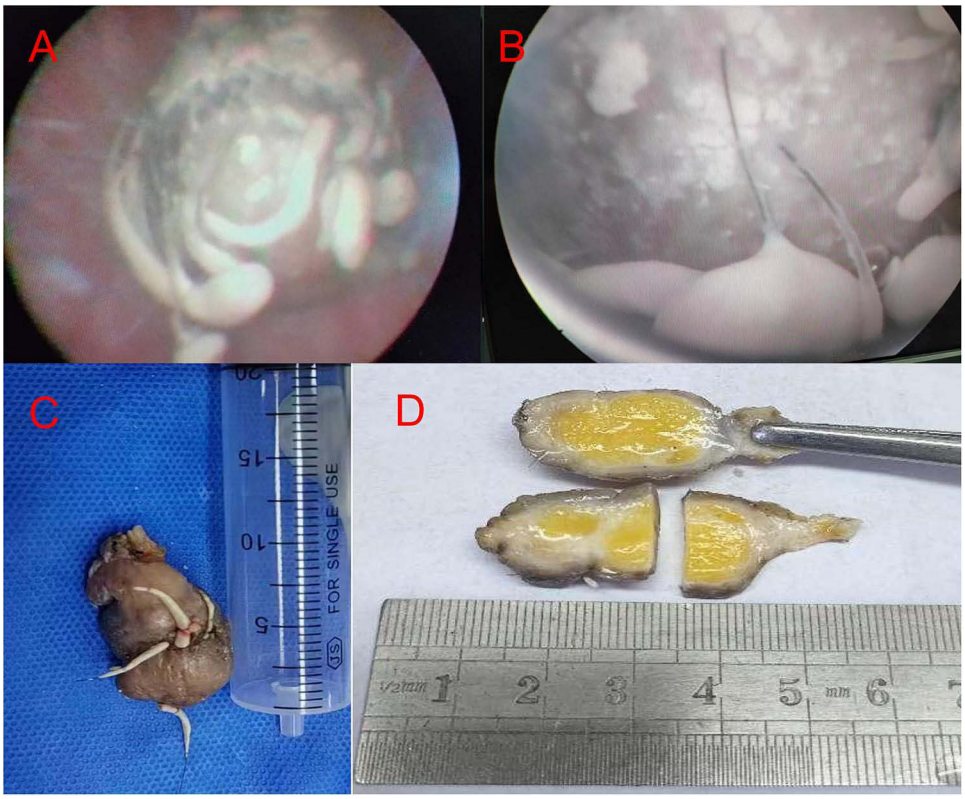

Figure 2 Neoplasia with stone on its surface and hair also attached so that it resembles a "needle mushroom" or "crab leg" (**A** and **B**). The complete neoplasia (**C**) and a yellow fat cross-section after incision (**D**).

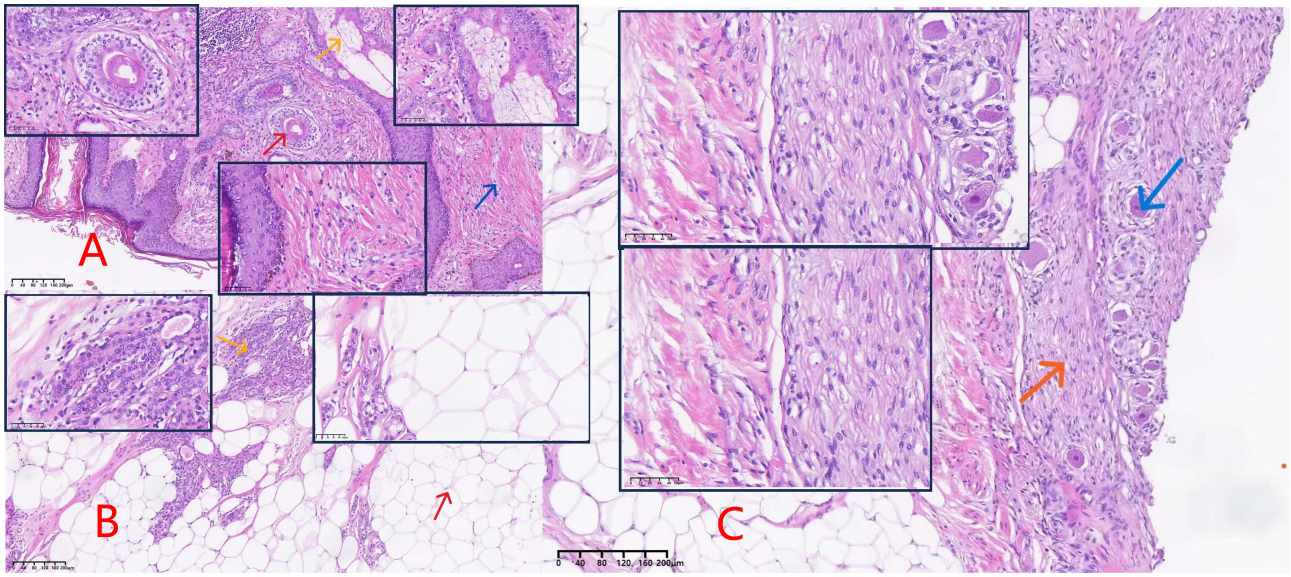

Figure 3 Histopathological slide shows high (20×20 for focal part) and low (10×10 for whole slice) magnification views. (**A**) Red arrow: hair follicle, yellow arrow: sebaceous gland, blue arrow: fibrous tissue. (**B**) Yellow arrow: glandular tissue, red arrow: adipose tissue. (**C**) Red arrow: nervous tissue, blue arrow: ganglion cells.

Subsequently, we disposed of the stone by ultrasonic pneumatic ballistic lithotripsy and resected the neoplasia completely by transurethral resection of the bladder tumor. The specimen appeared intact from its outward appearance (Figure 2C and D) and a postoperative CT scan demonstrated the same finding. The tumor was completely surgically removed. A histological examination confirmed it to be a mature teratoma, confined to the bladder wall (Figure 3).

The patient was discharged symptom-free and further follow-up observation was conducted.

Discussion

We reported on a case of a 53-year-old woman with teratoma occurring primarily in the bladder. In addition, we conducted a literature review and found nine reports about bladder teratoma from which to compare and summarize clinical data (Table 1). Searches in PubMed were performed with the terms "bladder" "teratoma" and "dermoid cyst" and cases were restricted to those published in English between 2000 and 2024.

Generally, teratoma can be classified into three types: mature teratoma, immature teratoma, and monodermal teratoma. Mature teratoma is encountered most frequently and accounts for 95% of cases.[2] Teratoma is a germ cell

Table 1 Summary of Clinical Data of Reported Bladder Teratoma Cases in Recent Years

	Age	Sex	Site	Presenting Complaints	Comorbidity	Examination Methods	Histopathological Report	Treatment	Follow-up
CASE1 2020[4]	22	Male	Bladder	Increased frequency of micturition, Burning micturition Graveluria Pilimiction	None	CT scan Cystoscopy	Mature teratoma	Transurethral tumor resection	Symptom-free whilst waiting for surgical excision
CASE2 2023[5]	48	Female	Bladder	Persistent foul-smelling urine Urinary tract infection	Bladder stone diverticulum	CT cystoscopy	Mature teratoma	Robotic-assisted laparoscopic partial cystectomy	Symptom-free Cystoscopy reexamination shows unremarkable findings
CASE3 2017[6]	27	Female	Bladder	Dysuria Symptoms of irritative lower urinary tract infection	None	X-ray CT scan Cystoscopy CT urogram	Mature teratoma	Partial cystectomy	Symptom-free Cystoscopy reexamination show unremarkable findings
CASE4 2018[7]	17	Female	Bladder	Gross hematuria dysuria	Bladder stone	CT scan Cystoscopy	Mature teratoma	Transurethral tumor resection	Waiting for surgical excision

(*Continued*)

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Table 1 (Continued).

	Age	Sex	Site	Presenting Complaints	Comorbidity	Examination Methods	Histopathological Report	Treatment	Follow-up
CASE5 2019[8]	17	Female	Bladder	Pain in suprapubic region Painless, total hematuria	Bladder stone	CT scan Ultrasound Cystoscopy	Mature teratoma	Transurethral tumor resection	Symptom-free Cystoscopy reexamination shows unremarkable findings
CASE6 2006[9]	29	Female	Bladder	Irritative voiding	None	Plain X-ray Ultrasound Cystoscopy	Mature teratoma	Transurethral tumor resection	Symptom-free
CASE7 2007[10]	34	Female	Bladder	Irritative lower urininfectionary tract Dysuria, suprapubic pain	None	Ultrasound Cystoscopy	Mature teratoma	Open bladder mass excision	-
CASE8 2017[11]	30	Female	Bladder	Left flank pain Dysuria	None	CT scan Ultrasound Cystoscopy	Mature teratoma	Transurethral tumor resection	-
CASE9 2010[12]	26	Female	Bladder	Passage of hair in urine hHematuria	None	CT scan Ultrasound Cystoscopy	Mature teratoma	Open bladder mass excision	Symptom-free

Abbreviations: CT, Computed tomography

tumor and contains multiple tissues from three germ cell layers. It can occur at any site of the median preaxial or closely paramedian areas of the body.[9] Most teratoma are asymptomatic and cannot be detected until routine physical examination, imaging examination, or abdominal or pelvic surgery for nonrelated issues. Perceptible symptoms may be variable due to tumor size, occupation of organs and characteristics of neoplasia, which may cause abdominal pain, a palpable mass during abdominal examination and other complications.[4] Table 1 shows that bladder teratoma mostly affects women under the age of 30; men only account for one-ninth of cases. The most common presenting complaint is a lower urinary tract infection over a long period of time, especially pilimiction. These symptoms may have extremely high diagnostic value. According to one review, ectodermal tissue like hair and other skin appendages can be found in almost 100% of mature teratoma.[2] Some comorbidities may exist simultaneously, like stones and diverticulum in the bladder, which result from a teratoma existing for a long time as a foreign entity in the bladder. As we all know, foreign objects present within the bladder have the potential to hasten the formation of stones, which impair the contractile function of the bladder, thereby giving rise to symptoms of urinary disorders.

CT scan and cystoscopy are the best means of diagnosis, especially cystoscopy because it can efficiently differentiate tumors from recurrent stones or urinary tract infection.

Transurethral resection of the mass is an excellent choice because it is a partial cystectomy and is not dependent on tumor invasion. In most cases, local resection proves to be adequate owing its favorable differentiation and the low invasive ability of the tumor cell. All cases were testified to be mature teratoma by histopathological report after surgery, which was consistent with a previous review.[2] On account of the fact that most teratomas have a benign nature, the prognosis is usually good; all cases, including ours, were symptom-free after surgery. Although follow-up and periodic cystoscopy are needed, urine tests combined ultrasound examinations are also viable alternatives. Further treatment is not considered unless the patient exhibits further symptoms.

Given this particular combination of a rare occurrence and a classic symptom, we hereby present this case to remind clinicians to consider this rare tumor in the bladder with various symptoms and help them make diagnostic and therapeutic decisions.

Conclusion

Teratoma in the bladder is usually rare but should be considered when encountering a patient with recurrent bladder stones or urinary tract infections. Cystoscopy can be employed as a diagnostic approach and total tumor excision usually suffices. Here, we reported on a 53-year-old woman with chief complaints of urinary interruption, pilimiction, and stones in her urine. She was diagnosed with bladder teratoma and rehabilitated after tumor resection surgery.

Ethics

Publication of this case report was approved by the Clinical Research Ethics Committee of the 985th Hospital of People's Liberation Army Joint Logistic Support Force, Taiyuan, Shanxi, China (Lunshen2024-003).

Declaration of Patient Consent

The patient consented to publication of images and other clinical information reported in this article. A written informed consent form was signed by her. We made efforts to ensure information about her identity did not appear in this article.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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