Ureteral diverticulum complicated by urinary lithiasis: About a case report

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ABSTRACT

Ureteral diverticulum is a rare urinary malformation and can frequently lead to urinary complications. It can be congenital, acquired or an abortive ureteral duplication. Most are treated conservatively. A surgical indication is made in case of symptomatic or complicated diverticulum. It can be congenital, acquired or an abortive ureteral duplication. Most of them are treated conservatively. A surgical indication is given in case of symptomatic or complicated diverticulum, and recurrent total hematuria. Radiological investigations confirmed the diagnosis of congenital ureteral diverticulum complicated with lithiasis.

Authors contributions

R. Mejri: participated in the writing of the manuscript.
K. Chaker: participated in the writing of the manuscript.
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S. Ben Rhouma: participated in the writing of the manuscript and its correction.
Y. Nouira: participated in the writing of the manuscript and its correction.

1. Introduction

Ureteral diverticulum is an extremely rare urologic abnormality. A few cases have been reported in the literature. To date, only about 50 cases have been reported. Ureteral diverticulum can be classified as congenital, acquired or abortive ureteral duplication. Its etiology remains unknown. During its evolution, complications of the urinary tract may occur. We present a new case with a review of the positive diagnosis, surgical treatment and long-term results.

2. Case report

A 38-year-old female with no specific medical history, presented to our consultation unit with chronic right lumbar pain evolving intermittently associated with recurrent total hematuria. Her clinical examination was unremarkable. The cytobacteriological analysis of the urine was normal as well as her renal function. Renal ultrasound showed a 15 mm right renal lithiasis without dilatation of the renal cavities. Intravenous urography was performed showing a right lumbar ureteral diverticulum with a stone (a dense radio-opaque shadow at the level of the L2 vertebra with a moderate proximal hydronephrosis). Both kidneys have a normal radiological appearance (Figs. 1 and 2).

The patient underwent a total surgical resection of the diverticular pouch with extraction of the calculus. An end-to-end ureteroraphy protected by a double J catheter was thus performed. No incident was observed in the postoperative follow-up. Histological examination showed a true ureteral diverticulum with all the layers of a ureteral wall. No signs of malignancy were observed.

With a follow-up of 12 months, the back pain and hematuria have completely disappeared and the radiological examinations of controls (KUB film, intravenous urography) did not reveal any abnormality (Fig. 3).

3. Discussion

Ureteral diverticulum is an extremely rare condition of the ureter. The first case of ureteral diverticulum was reported in 1808 by Pepere at autopsy, as described in the reports of Hale and Von Geldern.1 Scientific studies have reported a possible association of ureteral diverticulum with vesico-ureteral reflux, fibroepithelial polyp and trauma.2 Ureteral diverticula are subclassified into three categories: 1) abortive ureteral duplications (a bifid ureter with a blind termination); 2) true congenital diverticula containing all tissue layers of the normal ureteral wall; 3) acquired diverticula representing a mucosal herniation.3 An association of ureteral diverticula with complex abdominal and pelvic anomalies has been reported in pediatrics in conjunction with other congenital anomalies.

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anomalies. The etiopathology of ureteral diverticula is still unclear. The most plausible etiology is to consider that the genesis of ureteral diverticula is secondary to a congenital stenosis that formed either in uterus or shortly thereafter.\(^1\) There are several clinical presentation forms of ureteral diverticula, including asymptomatic form, incidental radiologic discovery, fleeting hematuria, and various urinary tract infection.\(^4\) In our case, the pain and hematuria are probably due to the displacement of the kidney stone in the excretory cavities. The calculation was initially at the kidney level confirmed by ultrasound data. Subsequently, the stone migrated and became encrusted at the level of the diverticulum causing moderate obstruction with exacerbation of pain. The radiological appearance is that of a ball-shaped, speculated formation. This formation has difficulty emptying on late films (failure to empty). The ureteral diverticulum may be single or multiple. It is often limited to the upper third of the ureter.\(^5\) Ureteral diverticula are susceptible to infectious complications and stone formation. Transitional cell carcinoma in a diverticulum of the lower ureter was described by G S Harrison in 1983. In other cases, R Querz\(^\prime\)e in a series of 16 patients with ureteral diverticula could not show a correlation between transitional cell carcinoma and the presence of a diverticulum. The lack of attention in the literature does not allow us to consider the ureteral diverticulum as a precancerous lesion. The main aim of surgical treatment is to remove the obstruction and restore ureteral patency through endoscopic or open approaches. Nephrectomy is performed in case of infectious complications or a completely destroyed kidney with much reduced function. Nowadays, there is no standardized treatment for complicated ureteral diverticula (calculus, obstruction, infection and diverticular perforation). Opinions vary between conservative treatment consisting in removing the obstacle and radical treatment (diverticulectomy with segmental resection of the diverticulum). In our case, we opted for the second choice in order to avoid any recurrence of stones, the theoretical risk of degeneration and serious infectious complications. Thus, our patient underwent diverticular resection with open surgical stone removal. In all cases and whatever the therapeutic attitude, radiological monitoring is indicated to detect in time subsequent complications, in this case secondary ureteral stenosis.

4. Conclusion

The ureteral diverticulum is a rare urological anomaly. It is discovered by chance or following a complication. The diagnosis is made during radiological examinations, especially the intravenous urography. The treatment is surgical in the complicated forms.

Fig. 1. Intravenous urography non-injected image: Lithiasis at the level of the L2 vertebra.

Fig. 2. a. Intravenous urography: right ureteral diverticulum, ball addition image. b. Intravenous urography 3/4 incidence: right ureteral diverticulum.
Declaration of competing interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

References

1. Hale NG, Von Geldern CE. Ureteral diverticula. Cal State J Med. 1921;19:284–287.
2. Satia S, Rbouma SB, Horchani A. Ureteral diverticulum in adults: diagnostic problems and therapeutic implications. UroToday Int J. 2011;5:86.
3. Herndon CD, McKenna PH. Antenatally detected proximal ureteral diverticulum. Urology. 2000;55(5):774.
4. McLoughlin LC, Davis NF, Dowling C, Eng MP, Power RE. Ureteral diverticulum: a review of the current literature. Can J Urol. 2013 Oct;20(5):6893–6896.
5. Socher SA, Dewolf WC, Morgentaler A. Ureteral pseudodiverticulosis: the case for the retrograde urogram. Urology. 1996;47:924–927.

Fig. 3. Intravenous urography 3/4 incidence: Normal urographic appearance at 12 months.

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