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Fibroepithelial polyps – a rare pathology of the upper urinary tract

DRAGOŞ GEORGESCU[1)], RĂZVAN MULŢESCU[1)], BOGDAN FLORIN GEAVLETE[1)], PETRIŞOR GEAVLETE[1)], CAMELIA DOINA VRABIE[2)], ISABELA-MAGDALENA DRĂGHICI[3)], CASIANA STĂNESCU[4)], AURELIA ENESCU[5)]

[1)]*Department of Urology, "St. John" Emergency Clinical Hospital, Bucharest, Romania*
[2)]*Department of Pathology, "St. John" Emergency Clinical Hospital, Bucharest, Romania*
[3)]*Department of Pediatric Surgery, "Maria Skłodowska Curie" Emergency Clinical Hospital for Children, Bucharest, Romania*
[4)]*Department of Obstetrics and Gynecology, Faculty of Medicine, "Vasile Goldiş" Western University, Arad, Romania*
[5)]*Department of Emergency Medicine, University of Medicine and Pharmacy of Craiova, Romania*

Abstract

Ureteral fibroepithelial polyps are a rather uncommon pathological entity. However, an increase of their incidence was recorded during the recent period, probably due to better access to the investigative methods. The aim of this study was to assess the diagnosis and endoscopic treatment particularities of these cases. Our experience was based on 11 cases evaluated in the last 12 years. The mean patients' age was 43 years (between 26 and 54). Hematuria, flank pain, suprapubic discomfort and urinary frequency were the main symptoms. Diagnosis was based on ultrasonography, IVP (intravenous pyelography), cystoscopy and ureteroscopy and confirmed by histopathology. In four cases, smooth polypoid masses covered by apparently normal urothelium and protruding through the ureteral orifice were discovered. In six cases, the fibroepithelial polyps appeared as a large filling defect in the ureter. In another case, a large, organized, blood clot protruding from the left orifice imposed ureteroscopy with the identification of a mid-ureteral polyp. Ten cases were treated by ureteroscopic laser ablation, while transureteral resection was applied in one case. After complete excision of the polypoid base, a double-J stent was indwelled for six weeks. Histology described the lesions as fibroepithelial polyps: hyperplastic urothelium overlying an intact basement membrane with extensive submucosal edema, dilated blood vessels, chronic inflammatory cells and fibrous stroma. No recurrences were found during a follow-up period of 56 months (between 6 and 72 months). Ureteral fibroepithelial polyps represent a rare pathology, ureteroscopy being the gold standard diagnostic method. The appearance and location of the lesions are pathognomonic, and complete excision may be performed by ureteroscopic approach. Recurrences seem to be rare in these tumors.

Keywords: fibroepithelial polyps, benign tumor, intravenous pyelography, ureteroscopy.

Introduction

Ureteral fibroepithelial polyps (FEP) are a rather uncommon pathological entity. Since their initial report in 1932 [1], only 236 cases of ureteral FEP were referenced until 2013 [2]. However, an increase of their incidence was recorded during the recent period, probably due to better access to the investigative endoscopic methods.

Imaging evaluations, including intravenous pyelography (IVP), computer tomography (CT) or magnetic resonance imaging (MRI) demonstrate non-specific features, implying the risk of misdiagnosis of malignant transitional cell carcinoma. The differential diagnosis of FEP with upper tract urothelial carcinoma is essential, the treatment of these entities being completely different. The macroscopic aspect evaluated during retrograde ureteroscopy is specific, allowing an appropriate management. The aim of this study was to determine the diagnosis and endoscopic treatment particularities of these cases.

Patients and Methods

Between December 2001 and November 2013, in our clinical department 11 patients (eight males and three females) with a FEP of the upper urinary tract were diagnosed and treated. The mean patients' age was 43 years (between 26 and 54).

Clinical features of these cases were evaluated. The investigative protocol was based on clinical examination, blood tests, ultrasonography, IVP, CT, cystoscopy and ureteroscopy. Urinary cytology was performed in all cases.

The diagnosis was made by retrograde ureteroscopy and confirmed histopathologically.

All the procedures were performed after obtaining informed consent from all patients in a routine clinical practice.

Regional anesthesia was used in all cases. Semirigid ureteroscopy was performed in eight cases, while other three benefited from flexible ones. For the last three cases, narrow band imaging (NBI) technology was used in order to identify characteristics suggestive for the benign or malignant nature of a lesion.

In all patients, the treatment implies the complete excision of the lesion. Ureteral JJ stents were left indwelling for six weeks postoperatively.

The duration of the hospital stay was noted, as well as all complications.

The follow-up protocol was based on IVP and ureteroscopy performed at three months after the procedure, and afterwards continued only with IVP yearly.

The mean follow-up period was 56 months (between 6 and 72 months).

Results

The clinical evaluation revealed that flank pain was the most common presenting symptom, being described in eight cases. Four patients presented macroscopic hematuria. Suprapubic discomfort and pain, urinary frequency and dysuria were the main symptoms in other four cases.

Imaging demonstrates non-specific aspects. Ultrasonography revealed no upper urinary tract dilation in four cases, first-degree hydronephrosis in three cases, second-degree hydronephrosis in three cases and third-degree hydronephosis in one case. In four patients, hyperechoic lesion without acoustic shadow protruding through the ureteral orifice into the bladder was described.

In all cases, on IVP or contrast-enhanced CT the fibroepithelial polyps appeared as a ureteral filling defect surrounded by contrast material in the ureter (Figure 1).

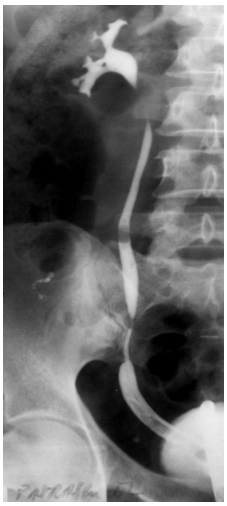

Figure 1 – ***Fibroepithelial polyp appearing like a filling defect of the right ureter on IVP.***

Cystoscopically, smooth polypoid masses covered by apparently normal urothelium and prolapsing through the ureteral orifice (Figure 2) were discovered in four cases.

In another case, a large, organized, blood clot protruding from the left orifice imposed ureteroscopy with the identification of a mid-ureteral polyp.

Retrograde ureteroscopy demonstrated a smooth, mobile, pedunculated mass within the ureter (Figure 3). The aspect of the tumor was specific in all patients. The origin of the tumor was located in the proximal ureter in seven cases and in the distal in four cases (Figure 4). The length of the polyp ranged between 1.5 and 12.5 cm (Figure 5).

Narrow-band imaging (NBI) in conjunction with flexible digital ureteroscopy, used in three cases, enhanced the contrast between mucosal surfaces and microvascular structures, allowing a more accurate diagnosis of the tumor.

Ten cases were treated by ureteroscopic laser ablation. In four cases, Nd:YAG (Figure 6) laser was used, while in other six the polyp was resected with Ho:YAG laser. Transureteral electroresection of a ureteral polyp (Figure 7) located in the distal ureter was performed in one case.

Complete removal of the polypoid base was obtained in all patients.

After the excision of the polyp, a double-J stent was indwelled for six weeks.

Mean operative time was 36 minutes (range between 17 and 62 minutes). No intraoperative incidents or complications were encountered.

The average length of hospital stay was 2.7 days (range 2 to 5).

Postoperatively, two patients complained from flank pain due to vesico-ureteral reflux and one patient presented prolonged hematuria treated conservative.

In all cases, histology confirmed the diagnosis established after retrograde ureteroscopy. He described the lesions as fibroepithelial polyps: hyperplastic urothelium overlying an intact basement membrane with extensive submucosal edema, dilated blood vessels, chronic inflammatory cells and fibrous stroma.

IVP performed in all cases at three months after the procedure showed a disappearance of the filling defect. Ureteroscopy demonstrate normal aspect of the urothelium at the tumoral site. No recurrences or ureteral stricture were registered during the follow-up period.

Discussion

Fibroepithelial polyp is a rare benign tumor of the urinary tract. Approximately 85% of them develop in the ureter, 15% in the renal pelvis and a small number in the bladder or posterior urethra (3). However, it is the most common benign lesion of the ureter.

Even though they may occur in any age, FEP is usually encountered in the third and fourth decades of life [3, 4]. They appear more frequently in males (male-female ratio 1.5:1) [3].

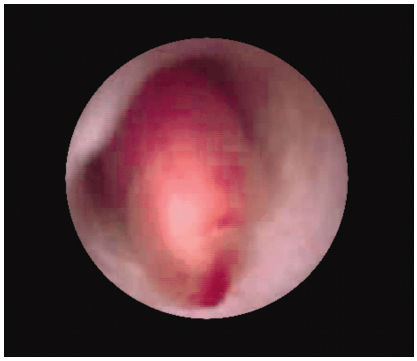

Figure 2 – ***Smooth polypoid masses covered by apparently normal urothelium, protruding through the ureteral orifice.***

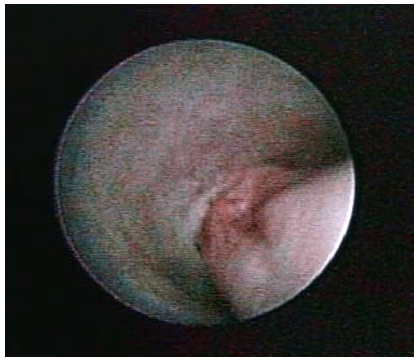

Figure 3 – ***Semirigid retrograde ureteroscopic approach showing a ureteral polyp.***

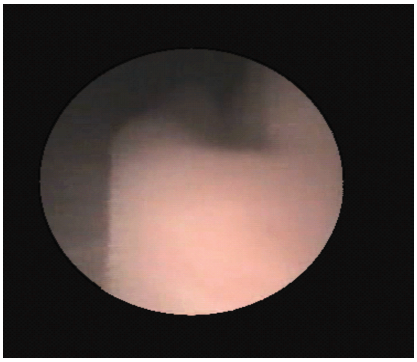

Figure 4 – ***Small attachement base of the ureteral fibroepithelial polyp in the distal ureter.***

Figure 5 – ***Eight centimeters long ureteral polyp (macroscopic post-operative aspect).***

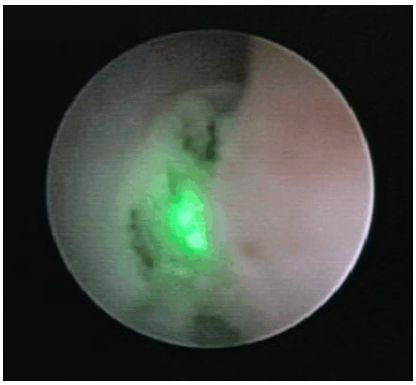

Figure 6 – ***Ho:YAG laser vaporization of the tumoral implantation area.***

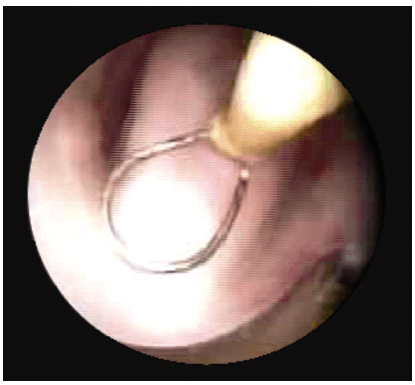

Figure 7 – ***Trans-ureteral electroresection of the ureteral polyp.***

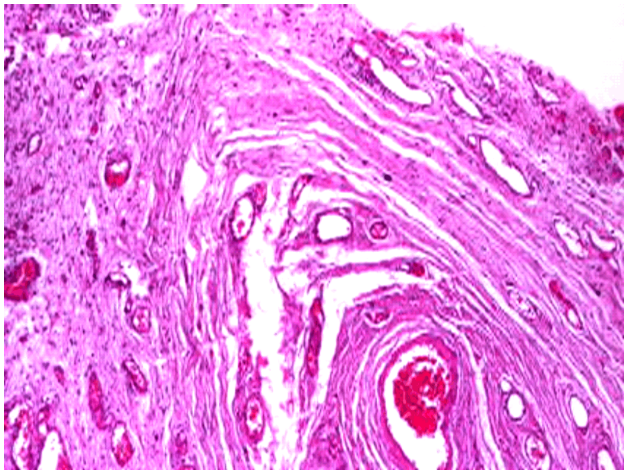

Figure 8 – ***Histopathological aspect demonstrating loose fibrous tissue with smooth muscular layer. HE staining, ×100.***

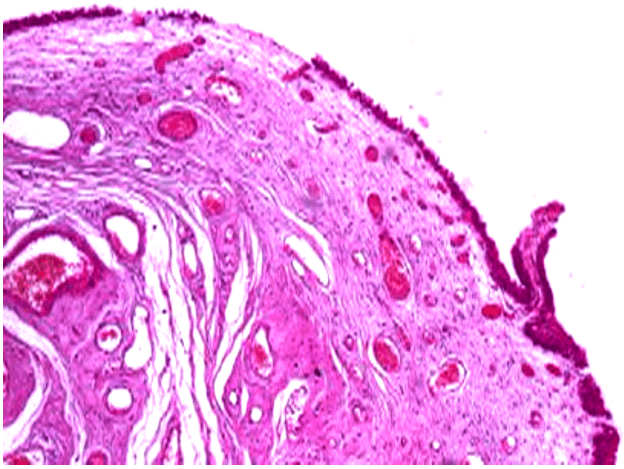

Figure 9 – ***Hyperplastic urothelium with vascular tissue. HE staining, ×40.***

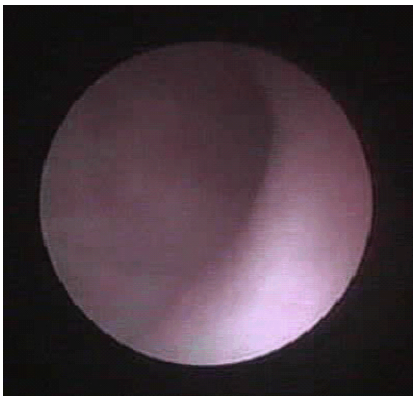

Figure 10 – ***Normal postoperative ureteroscopic aspect after three months.***

The ureteral FEP is usually located on the proximal portion of the ureter [5], approximately 62% of ureteral FEPs occurring at the ureteropelvic junction or upper ureter [3, 6]. The left ureter is affected twice as often as the right [7].

Data from literature indicates that these tumors vary in size from 0.6 to 12 cm [8].

Their etiology is still unknown. Cases arising in children are probably of congenital origin [9] while in adults the occurrence is presumed to be secondary to chronic exposure to infectious, inflammatory, obstructive or traumatic agents [10]. Different other factors as allergies and hormonal disturbances have been considered to be involved in the etiology of this disease [11].

Fibroepithelial polyps are benign tumors of mesodermal origin. This group of tumors includes also angiomatous polyps, leiomyomas, hemangiomas, neurofibromas, lymphangiomas, granulomas and endometriomas [12, 13].

Typically, they present as a smooth, mobile, pedunculated mass in the upper urinary tract, with an intact mucosal surface [11]. The tumors are usually cylindrical, sessile or, rarely, frond-like.

Histological, fibroepithelial polyps are characterized by a loose vascular fibrous stroma derived from the mesoderm with overlying benign transitional epithelium [11]. The central edematous stromal stalk often contains collagen, smooth muscle fibers, fibroblasts, and occasional acute and chronic inflammatory cells [13].

Most of the lesions are solitary, but there have been few reports of multiple fibroepithelial polyps affecting the renal pelvis and ureter [14–16].

It is a tumor of slow growth [17], the resulting hydronephrosis being often less frequent than expected [18]. In our experience, different degrees of hydronephrosis were noted in 64% of cases.

Despite the fact that FEPs are benign lesions, cases of coexistent transitional cell carcinoma or malignant degeneration have been reported in the literature [19, 20].

From the clinical point of view, ureteral fibroepitelial

polyps are not significantly symptomatic if they do not provide partial or complete obstruction. Depending on polyp size and location [21], the patients could present obstructive or irritative symptoms such as flank or suprapubic pain, hematuria, frequency and dysuria [5].

Preoperative detection of ureteral polyp is usually unreliable. Imaging diagnostic studies show ambiguous space occupying lesions [17]. The features are similar to the malignant transitional cell carcinoma on IVP, conventional CT and MRI [22]. Adey *et al.* [23] reported that only two of nine cases were diagnosed with fibroepithelial polyp preoperatively based on filling defects demonstrated by IVP.

Excretory or retrograde pyelography usually shows an elongated, smooth ureteral filling defect within the ureter surrounded by contrast material. Aside from the implantation zone, an FEP may show mobility and change position between images, unlike the fixation that is encountered with most urothelial carcinoma [24]. On CT, FEP is usually described as a filling defect with a surrounding, continuous rim of contrast. This filling defect is attached to one part of the ureteral wall; this feature may be helpful in diagnosis [24]. However, blood clots and ureteral stones can determine similar filling defects and may thus appear to be indistinguishable from an FEP.

On MRI, FEP appears as a T2-hyperintense and T1-isointense filling defect within the ureter. Post gadolinium-enhanced images reveal enhancement of the FEP without ureteral wall thickening or enhancement [22].

Retrograde ureteroscopy is the main investigative method, the macroscopic aspect of the polyp being specific in the majority of cases. In our experience, the benign aspect of the lesion presumed after retrograde ureteroscopy was confirmed by the histopatological examination in all patients.

In case of a doubtful ureteroscopic aspect, NBI technology in conjunction with digital ureteroscopy may increase the accuracy of the diagnosis. NBI is an optical image technique designed for endoscopy to enhance the contrast between mucosal surfaces and microvascular structures without the use of dyes. The basis of this optical technique is represented by white light being filtered into two discrete center wavelengths for blue (415 nm) and green (540 nm) [25]. This narrow band of light is strongly absorbed by hemoglobin and penetrates only the surface of tissue, increasing the visibility of capillaries [26]. Therefore, the vascular structures appear dark brown (capillary vessels) and green (veins), thus contrasting with the pink or white background of normal mucosa [25, 27]. In our experience, NBI with digital flexible ureteroscopy was used in three cases.

A major problem concerning the fibroepithelial polyps of the ureter consisted in the differential diagnosis with other ureteral pathologies, leading to inaccurate diagnosis and treatment. In general, differential considerations for ureteral tumors include malignant lesions such as transitional cell carcinoma, rare benign mesenchymal tumors, and non-neoplastic etiologies including blood clots, sloughed papillae, fungus ball, or rare parasitic infection [28]. Polyps associated with obstruction and stone formation increase the risk of misdiagnosis with malignant tumors.

Ureteral FEP can be long enough to protrude into the bladder resulting in confusion with bladder tumors [29]. We encountered four such cases. Cystoscopy was the main investigation, showing the smooth mass protruding through the ureteral orifice. The subsequent retrograde ureteroscopy allows the visualization of the entire length of the polyp as well as the polypoid base.

It is important to distinguish fibroepithelial polyp from urinary tract carcinoma, because management and prognosis are significantly different. Therefore, a large number of fibroepithelial polyps reported in the literature were discovered at the time of nephroureterectomy for a presumed ureteral transitional cell carcinoma [30]. Debruyne *et al.* reported that unnecessary nephroureterectomies were performed in 42 of 112 (37%) patients with FEP because of an uncertain preoperative diagnosis [31]. Lam *et al.* suggested obtaining histopathological diagnosis through biopsy before definitive treatment [17]. However, the current tendency is resection at the moment of diagnosis under direct vision, but only when typical macroscopic characteristics of the polyp are recognized. If the polyp is atypical, an intraoperative histopathological study can be carried out. Radical surgery is not affected if the histopathological result indicates malignancy after endoscopic resection, as recently proposed by Sun *et al.* [32].

The treatment of these benign polyps is dictated by the degree of obstruction, involvement of the urinary tract, and intraoperative impression of carcinoma.

Fibroepithelial polyps have traditionally been treated by means of open exploration with nephroureterectomy or resection with reanastomosis. Before the widespread of ureteroscopy, diagnosis differentiating malignant or benign lesions was difficult. In the 70s, Stuppler and Kandzari stated that all ureteral tumors, except those whose benign origin can be assured, should be treated aggressively with procedures such as nephrectomy and nephrouretectomy [33].

With the advent of smaller ureteroscopes and the Ho:YAG laser, these patients may now be treated endoscopically. Ureteroscopic approach is an acceptable treatment option with minimal adverse complications and durable treatment outcomes, even for large UFPs [17, 34, 35]. However, ureteroscopic resection can be difficult in patients with a long, polypoid lesion. This difficulty is often due to inability to access the base of the stalk because of hindrance from the pedunculated body of the lesion, which often can hang inferiorly for several centimeters and take up the entire lumen of the ureter. Visualization may also be poor and little working space is available, making it difficult to differentiate the ureteral wall from the polyp itself.

Percutaneous treatments have been described in cases with tumor localized in the pyelocaliceal system, ureteropyelic junction or proximal ureter [17]. This alternative offers a minimally invasive approach in which direct visualization of the base of the polyp is achieved and allows easy removal of the polyp once the stalk is excised [17].

FEPs should be taken into account as a possible cause of ureteropyelic junction obstruction, especially in young adults. In these cases, resection of the polyp with

Anderson–Hynes pyeloplasty is a safe and effective procedure and may be performed laparoscopically [36].

Successful laparoscopic treatment has been described in patients with large, long polyps as well as with multiple polyps. Even though this technique requires three incisions, it has the advantage of extracting the specimen at its base, thus avoiding recurrence [37]. A recent report concludes that laparoscopic robot-assisted polypectomy is also a safe and acceptable surgical option for the excision of ureteral polyps [2].

Even if the risk of recurrence for these tumors is low, a close follow-up is recommended.

The duration and frequency of follow-up are not clearly established in the literature. Controversies exist also concerning the investigative methods during the follow-up. An IVP performed at three months after the procedure and yearly thereafter constitute a reasonable option. Some studies have suggested control ureteroscopy associated with IVU in the follow-up [38]. We chose to perform retrograde ureteroscopy at three months after the polyp resection in order to evaluate the local aspect of the urothelium and to confirm the complete resection of the polyp base.

Although some studies have suggested cytological evaluation of urine in the postoperative follow-up, other authors do not agree with this because of the benign nature of FEP.

Conclusions

Ureteral fibroepithelial polyps represent a rare pathology, ureteroscopy remaining the gold standard diagnostic method. Ureteral malignancy must be excluded in cases where a ureteral mass is detected. The ureteroscopic appearance of the lesions is pathognomonic, and complete excision may be performed. Endoscopic management of ureteral fibroepithelial polyps is an acceptable treatment modality with minimal morbidity and durable treatment results. Recurrences seem to be rare in these tumors.

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Corresponding author
Isabela-Magdalena Drăghici, Lecturer, MD, PhD, Department of Pediatric Surgery, "Maria Skłodowska Curie" Emergency Clinical Hospital for Children, "Carol Davila" University of Medicine and Pharmacy, 20 Constantin Brâncoveanu Avenue, Sector 4, 041451 Bucharest, Romania; Phone +40744–364 856, e-mail: isabelamagdalena@yahoo.com

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