

# Fibroepithelial Polyp of the Lower Urinary Tract in Adults

Toyonori Tsuzuki, MD, PhD\*‡ and Jonathan I. Epstein, MD\*†

**Objective:** Fibroepithelial polyps of the urinary tract are rare with most cases reported in children.

**Design:** We report the clinicopathologic features of 12 fibroepithelial polyps of the lower urinary tract in adults.

**Patients:** There were 9 males, 2 females, and 1 patient where the gender was unknown (median age, 44 years; range, 17–70 years).

**Results:** Chief clinical symptoms were hematuria, urinary urgency, and hesitancy. Five patients were asymptomatic, where the lesions were discovered incidentally. Most lesions were located near the verumontanum or the bladder neck. Ten patients were treated by transurethral resection. Of the 10 patients with follow-up information, none showed recurrence (mean, 20 months; median, 17 months). Histologically, all of the fibroepithelial polyps were lined by normal-appearing urothelium, with in one lesion the additional finding of a columnar epithelial lining. There were three overall architectural patterns seen within fibroepithelial polyps. The most common pattern (Pattern 1) seen in 5 cases consisted of a polypoid mass with club-like projections resembling a cloverleaf with florid cystitis cystica et glandularis of the nonintestinal type in the stalk. The second pattern (Pattern 2) seen in 4 cases consisted of a papillary tumor composed of numerous small, rounded fibrovascular cores containing dense fibrous tissue. The last morphologic pattern (Pattern 3) consisted of a polypoid lesion with secondary tall finger-like projections, which was seen in 3 cases. All lesions lacked prominent edema and inflammation seen in polypoid cystitis. Fibroepithelial polyps contained broader stalks with dense fibrous tissue, in contrast to the thin delicate loose fibroconnective tissue seen in the stalk of papillomas. One lesion contained atypical degenerative-appearing stromal cells.

**Conclusions:** Although fibroepithelial polyps have been considered to be congenital, we think that some of these polyps could develop after birth because all of our patients first showed clinical symptoms in adulthood. Because fibroepithelial polyps in adults are rare, some of these cases can be misdiagnosed as urothelial neoplasms or reactive conditions. Recognition of the precise histologic features of fibroepithelial polyp can facilitate its correct diagnosis.

**Key Words:** fibroepithelial polyp, bladder

(*Am J Surg Pathol* 2005;29:460–466)

Fibroepithelial polyp of the lower urinary tract is an uncommon disease. Although it predominantly develops in childhood including neonates, it also occurs in adults. Most reports are written from the clinical point of view, where it is a relatively well-known disease entity in pediatric urology, especially in the upper urinary tract. However, its precise pathologic features are not well described with only two case reports of this entity reported in the pathology literature<sup>1,16</sup>

In this report, we describe 12 cases of adult fibroepithelial polyp of the urethra and bladder. Also discussed are their clinical features, etiology, and differential diagnosis.

## MATERIALS AND METHODS

We identified 12 cases seen initially at our institution (n = 6) or in consultation by one of the authors (n = 6). The inside cases were identified prospectively by the author from 1997 to 2003. All available hematoxylin and eosin-stained slides from each case were reviewed. Clinical presentation and follow-up were obtained by medical records or from the correspondence with outside physicians.

## RESULTS

### Clinical Presentation and Follow-up

The patients, 9 males, 2 females, and 1 unknown, ranged from 17 years to 70 years of age (mean, 47 years; median, 44 years). Presenting symptoms included urinary urgency (4 cases) and gross hematuria (2 cases). One patient presenting with urgency and frequency was identified in the follow-up of papillary high-grade urothelial carcinoma and carcinoma in situ of the bladder, which had been treated by transurethral resection (TUR), bacillus Calmette-Guerin, and mitomycin C. None of the other patients had a prior history of urothelial carcinoma or instrumentation. In no patient was there a history of calculus or urinary tract infection. Six patients showed no clinical symptoms, 2 cases were found associated with radical prostatectomy for prostate cancer, 2 were discovered at the time of gynecologic ultrasound, and 1 was found at the time of urethral catheterization prior to orthopedic surgery. One lesion was incidentally discovered during the course of treatment of prostatitis and varicocele. Follow-up information was available for 10 of 12 patients. All patients whose follow-up data were

From the Departments of \*Pathology and †Urology, Johns Hopkins Hospital, Baltimore, MD; and the ‡Department of Pathology, Nagoya Daini Red Cross Hospital, Nagoya, Japan.

Reprints: Jonathan I. Epstein, MD, Johns Hopkins Hospital, Department of Pathology, Weinberg Building, 401 N. Broadway, Room 2242, Baltimore, MD 21231 (e-mail: jepstein@jhmi.edu).

Copyright © 2005 by Lippincott Williams & Wilkins

available had no evidence of recurrence after their TUR or prostatectomy (mean, 22 months; median, 17 months). In a few cases, follow-up consisted of cystoscopy; but in most cases, it was based on a lack of clinical symptoms and signs of urothelial disease.

### Pathologic Features

Half of the fibroepithelial polyps were located in the urethra: 3 proximal to the verumontanum, 1 distal to the urinary sphincter, 1 near the bladder neck, and 1 unspecified. The remaining 6 lesions were noted in the bladder: 3 not specified, 1 bladder neck, 1 right wall, and 1 trigone.

Macroscopic descriptions were obtained from 6 cases. One fibroepithelial polyp was described as an elongated polyp and another as a polypoid fragment. The other lesions were merely noted as being of pink to tan fragmented soft tissue. For the lesions noted at cystoscopy, the urologist used the term "tumor" to describe them (Fig. 1). Although the radical prostatectomy specimens in which two lesions were found incidentally were serially sectioned at 3-mm intervals, the presence of the polyps were not detected at the time of gross dissection. The maximum dimension of the lesions ranged from 0.05 cm to 2.9 cm (median, 1.0 cm; mean, 1.0 cm).

Histologically, all of the fibroepithelial polyps were lined by normal-appearing urothelium; in 1 case, there was the ad-

ditional finding of a columnar epithelial lining. Mitotic figures were not identified. There were three architectural patterns seen within fibroepithelial polyps. The most common pattern seen in 5 cases consisted of a polypoid mass with club-like projections resembling a cloverleaf, with florid cystitis cystica et glandularis of the nonintestinal type in the stalk (Pattern 1) (Fig. 2). In 1 case, the cystitis cystica et glandularis was particularly florid with crowded back-to-back glands (Fig. 3). In a different case, there was focal cyst formation with intracystic papillary projections mimicking a papillary urothelial tumor (Fig. 4). Although the nests in Pattern 1 fibroepithelial polyps were predominantly discrete and round resembling cystitis cystica, fibroepithelial polyp contained areas of anastomosing nests, resembling inverted papilloma (Fig. 5). In all 5 cases, the stroma within the polypoid projections was fibrous with no significant inflammation and no edema. Focally in 1 case, recent hemorrhage with hemosiderin deposition was noted. One case contained degenerative stromal atypia with hyperchromatic, large nuclei with smudgy-appearing chromatin (Fig. 6).

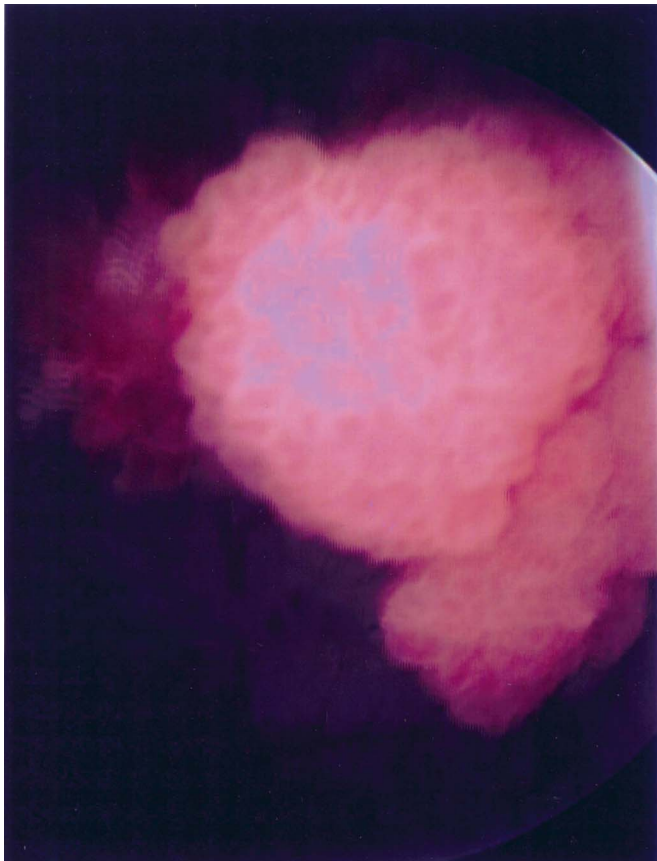
Another pattern seen in 4 cases consisted of a papillary tumor composed of numerous small, rounded fibrovascular cores containing dense fibrous tissue (Pattern 2) (Fig. 7). One case, in addition to the urothelial lining, had areas of glandular differentiation (Fig. 8). In 1 case, there was focal calcification and a lymphoplasmacytic infiltrate with the other cases showing no inflammation.

The final pattern consisted of a polypoid lesion with secondary tall finger-like projections (Pattern 3), which was seen in 3 cases (Figs. 9, 10). The projections were typically single, although occasionally branched. None of the cases showed significant inflammation. One case showed no edema where the projections consisted of fibrous tissue. The 2 other cases had focal edema in addition to dense fibrous tissue; in 1 case, the edema localized beneath the urothelium. In 2 cases, the vasculature was prominent, with hyalinized vessels in 1 case and numerous small capillaries in the other.

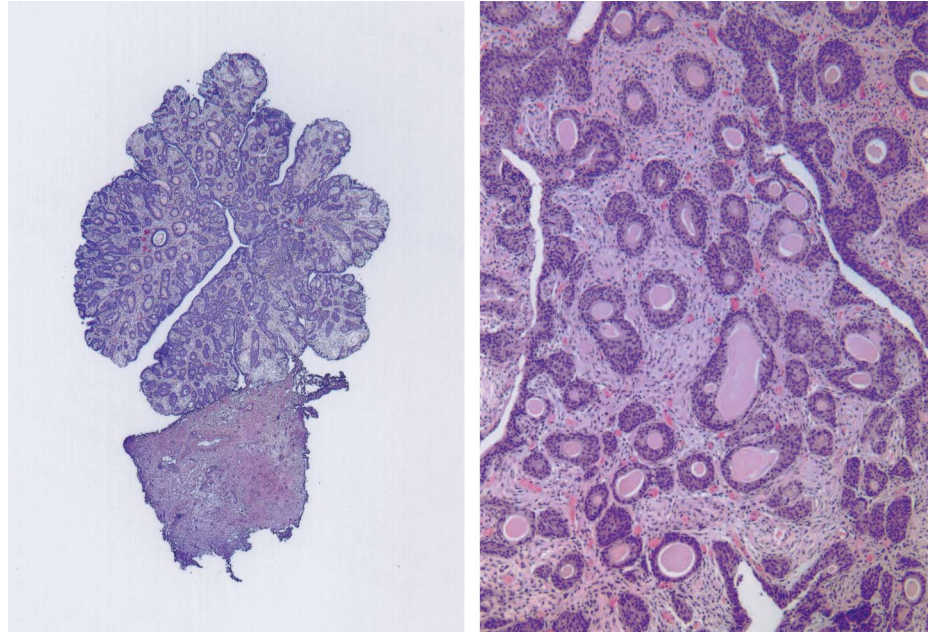
### DISCUSSION

Fibroepithelial polyp of the lower urinary tract is a relatively rare disease entity that is considered to be a nonneoplastic condition. It has a marked male predominance, as is also seen in fibroepithelial polyps of the ureter.<sup>3,15</sup> More than half of the reported cases occur in neonates or children, some of which are associated with urogenital malformations.<sup>11</sup> However, cases have also been reported from the second to fourth decades.<sup>6,7,9,12,14,16,17</sup> Their main clinical manifestations are urinary obstruction, urinary hesitancy, dysuria, enuresis, hematuria, infection, and flank pain. They are usually diagnosed by cystourethrography or cystoscopy and are treated by TUR, following which the lesion does not usually recur.<sup>7,8,11</sup> Most of our cases and those reported in the literature occur in or near the verumontanum or bladder neck.

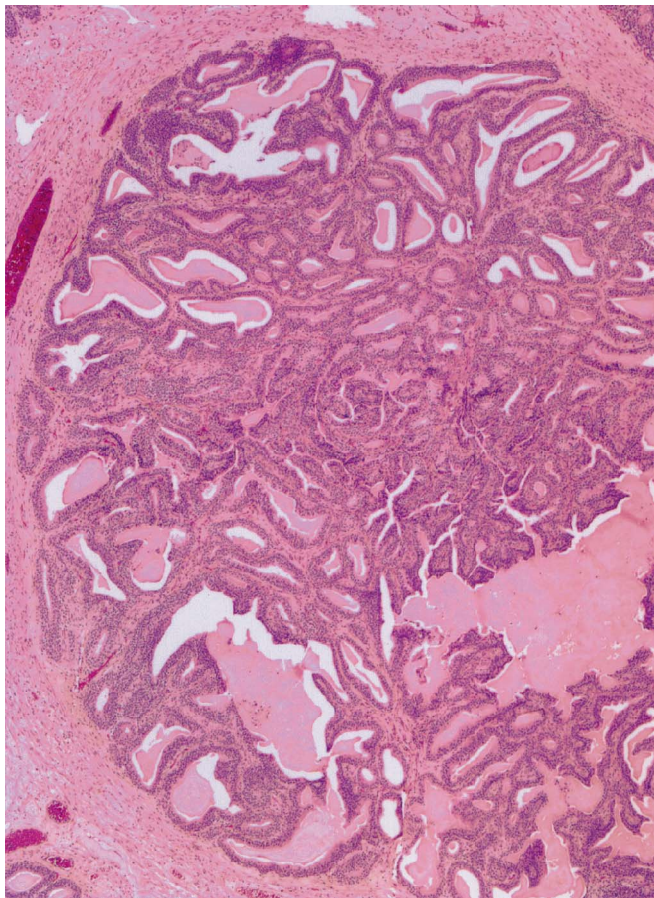
The etiology of fibroepithelial polyp is controversial. Downs<sup>7</sup> postulated that the polyps resulted from a defective protrusion of the urethra wall, while Kuppasami and Moors speculated that maternal estrogen might effect secondary epithelial change.<sup>10</sup> Another consideration by Lou et al is that of a congenital anomaly, which has been the most popular



**FIGURE 1.** Cystoscopic appearance of fibroepithelial polyp revealing a complex polypoid mass indistinguishable from a papillary urothelial neoplasm.



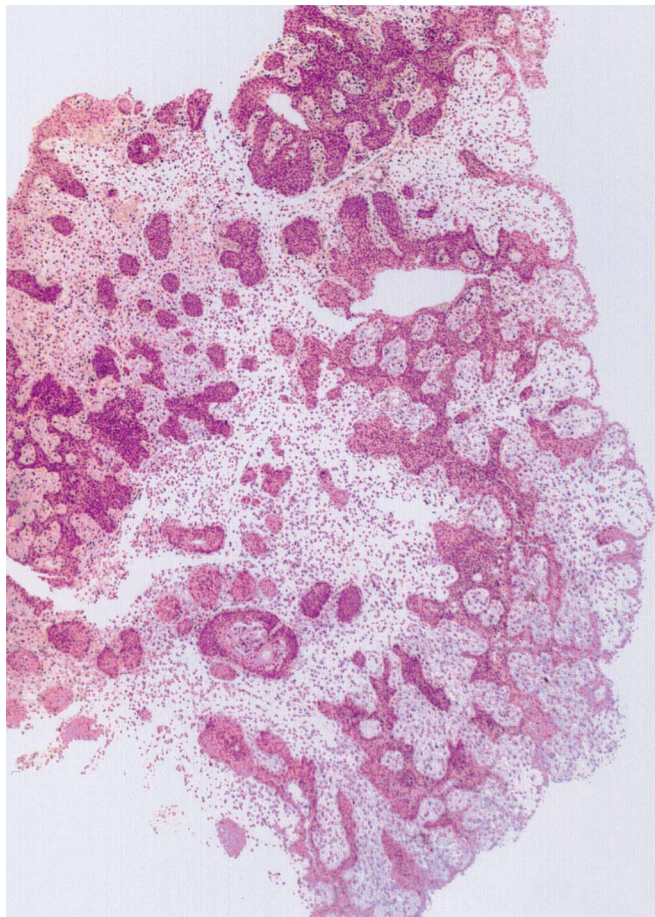
**FIGURE 2.** Pattern 1 fibroepithelial polyp with areas resembling cystitis cystica et glandularis.



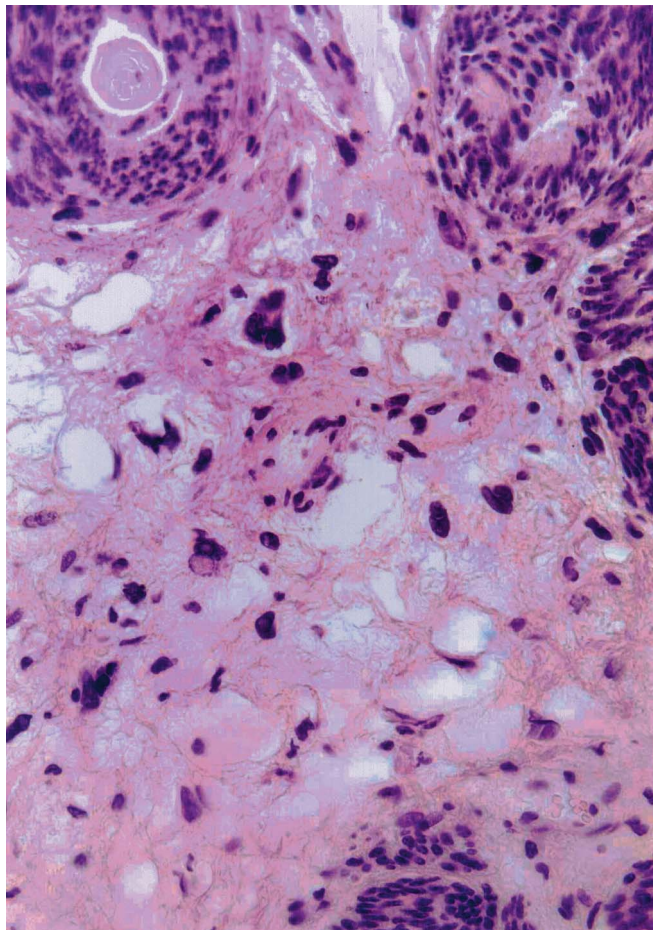
**FIGURE 3.** Pattern 1 fibroepithelial polyp with areas of back-to-back glands in the stalk.



**FIGURE 4.** Pattern 1 fibroepithelial polyp with intracystic papillary component.



**FIGURE 5.** Pattern 1 fibroepithelial polyp with focally anastomosing nests resembling inverted urothelial papilloma.



**FIGURE 6.** Pattern 1 fibroepithelial polyp with stromal cells showing degenerative atypia.

concept.<sup>11</sup> Interestingly, some of the cases that were reported as “congenital” fibroepithelial polyps showed their first clinical symptoms in adolescence or adulthood.<sup>4,7,12,14</sup> It is unlikely that all fibroepithelial polyps in adults are congenital, as it is unreasonable that congenital lesions would not show any clinical manifestation for two or more decades. One of our patients had been followed with cystoscopy for bladder cancer where there was no evidence of his fibroepithelial polyp of the bladder until he later complained of urinary urgency. This case and the later age of many of our cases support that some fibroepithelial polyps arise after birth. Half of the cases were discovered without any symptoms, suggesting that fibroepithelial polyps are more common than the incidence reported in the clinical literature, although they are still rare.

The most common entities to enter into the differential diagnosis with fibroepithelial polyps include florid cystitis cystica et glandularis, polypoid/papillary cystitis, urothelial papilloma, and inverted papilloma.

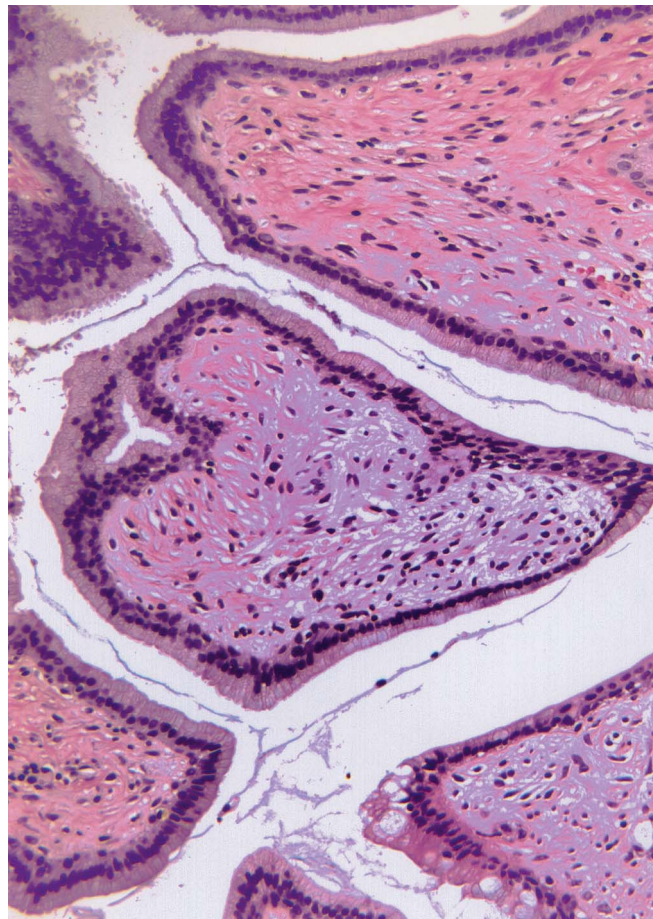
The most common morphologic variant of fibroepithelial polyps contained florid cystitis cystica et glandularis (Pattern 1). The overall cloverleaf-like configuration seen at low magnification is unique to fibroepithelial polyp and not seen in cystitis cystica et glandularis. It would also be dis-

tinctly unusual for cystitis cystica et glandularis to present as a solitary polypoid lesion in an otherwise unremarkable bladder.

Architecturally, polypoid cystitis consists of polypoid projections of the urothelium rising from the surface of the bladder. In contrast, the Pattern 3 fibroepithelial polyps consisted of polypoid mass protruding into the bladder with secondary finger-like projections. Although two of the fibroepithelial polyps had focal stromal edema and one had focal chronic inflammation, they lacked the generalized edema and inflammation that characterize polypoid cystitis. Even in the later stages of polypoid cystitis when the edema abates and is replaced by fibrous tissue (papillary cystitis), there is still a lymphocytic inflammatory component and the fibrous tissue has a cellular scar-like appearance. Polypoid cystitis is easily recognized as inflammatory by the urologist at cystoscopy and distinguished from urothelial neoplasm.<sup>5</sup> Polypoid cystitis results from injury to the bladder, such as instrumentation, fistulae, etc, where larger areas of the bladder tend to be involved, the surrounding mucosa has an inflamed appearance, and the polypoid lesion has a characteristic appearance with edema and a simplified architecture. In contrast, at cystoscopy, fibroepithelial polyp occurs as a solitary, complex polypoid



**FIGURE 7.** Pattern 2 fibroepithelial polyp with numerous small, rounded fibrovascular cores containing dense fibrous tissue.

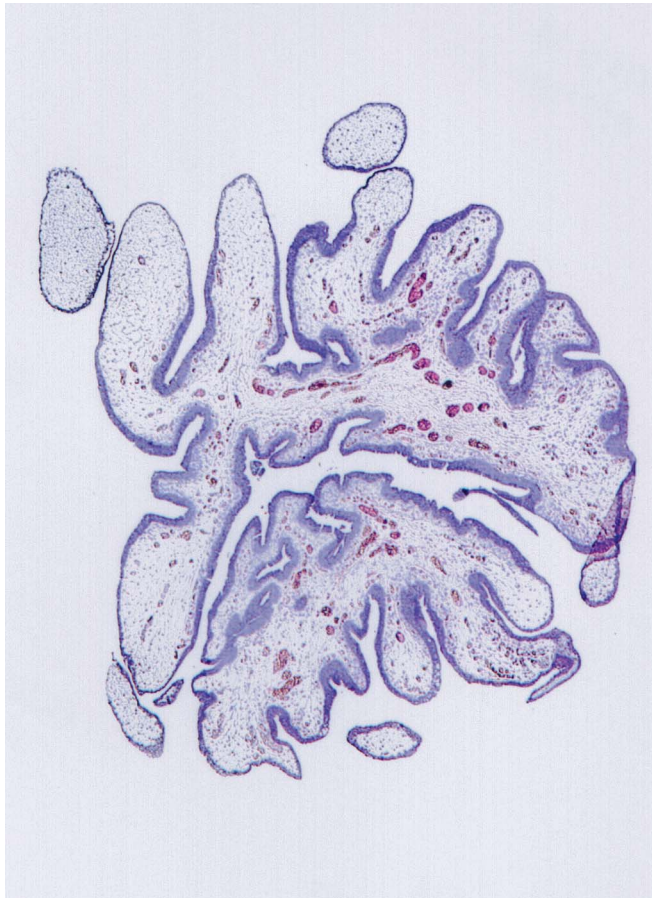


**FIGURE 8.** Pattern 2 fibroepithelial polyp with areas showing glandular differentiation.

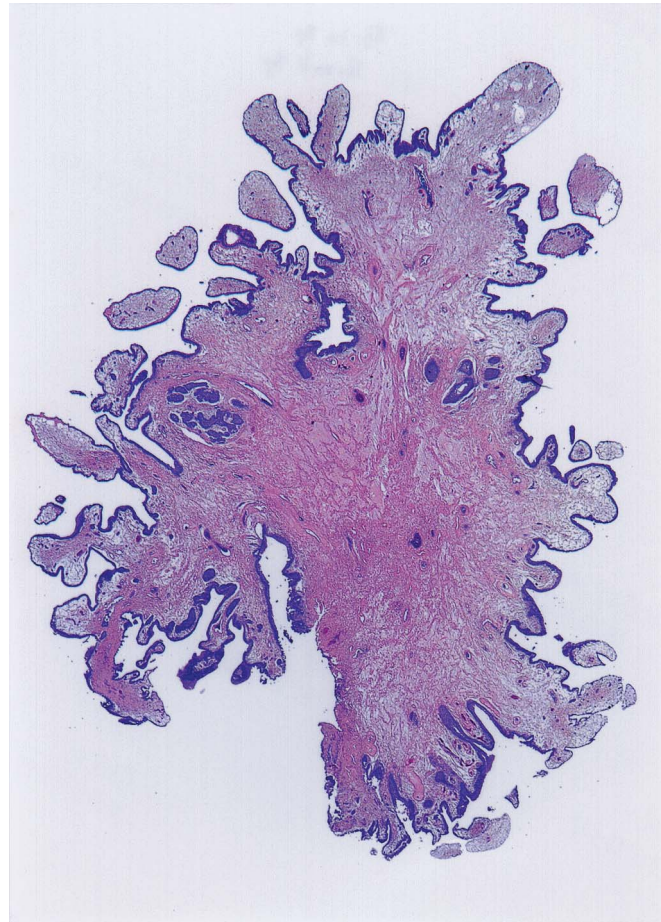
mass in an otherwise unremarkable bladder, indistinguishable from a urothelial tumor. While both polypoid cystitis and fibroepithelial polyps are benign conditions, a misdiagnosis of fibroepithelial polyp as polypoid cystitis can have consequences. The discrepancy between an erroneous histologic diagnosis of polypoid cystitis and the cystoscopic impression of a neoplasm could lead to urologists' uncertainty regarding the case and potentially decreased confidence in the pathologist's diagnostic ability. In addition, urologists may feel compelled to work up a diagnosis of polypoid cystitis as to its etiology.

The most critical differential diagnosis is between fibroepithelial polyp and urothelial papilloma and inverted papilloma. The presence of a papillary lesion lined by normal urothelium defines urothelial papilloma such that it would not be unreasonable for such a diagnosis to be rendered in cases of fibroepithelial polyp, especially Patterns 2 and 3. In 2 of our cases sent in as consults, papilloma was the outside diagnosis and in a third case it was papillary urothelial neoplasm of low malignant potential. As fibroepithelial polyps are rare, it is often not considered in the histologic differential diagnosis of papillary/polypoid lesions within the bladder. Architecturally, fibroepithelial polyps appear more polypoid, rather than the papillary morphology seen in papillomas. In contrast to

urothelial papilloma, fibroepithelial polyps also have broader, fibrous stalks. The fibrous tissue is denser than the delicate loose fibroconnective tissue with the stalks of papillomas. One of our cases with a florid cystitis cystica pattern was interpreted at an outside institution as inverted papilloma. In contrast to inverted papilloma with anastomosing nests of urothelium extending down from compressed overlying urothelium, the nests in most Pattern 1 fibroepithelial polyps are discrete round nests. One of our Pattern 1 fibroepithelial polyps did have areas of anastomosing nests, reminiscent of an inverted papilloma. However, all of the Pattern 1 fibroepithelial polyps had the overall polypoid club-shape growth pattern and a more prominent dense fibrous matrix than inverted papilloma. While both fibroepithelial polyps and urothelial papillomas and inverted papillomas are benign, the distinction between these entities is critical given their different clinical management. Patients with urothelial papillomas currently are routinely followed with urine cytologies and periodic cystoscopies to detect recurrences. Although most urothelial papillomas are cured following initial excision, occasionally they may recur and uncommonly can even exhibit progression with subsequent tumors.<sup>13</sup> Consequently, the diagnosis of urothelial papilloma may subject a patient to potentially life-long follow-up of the urinary tract. Although the association of inverted



**FIGURE 9.** Pattern 3 fibroepithelial polyp with areas showing edematous projections resembling polypoid cystitis. Other areas had a more fibrous appearance.



**FIGURE 10.** Pattern 3 fibroepithelial polyp with fibrous projections demonstrating subepithelial edema.

papillomas with transitional cell carcinoma is controversial, the most recent evidence suggests an association where, following the removal of inverted papillomas, patients may undergo cystoscopic surveillance.<sup>2</sup> Misdiagnosing a fibroepithelial polyp as a papilloma or inverted papilloma is all the more critical given the relatively young age of patients with fibroepithelial polyps, where a diagnosis of papilloma would potentially subject them to decades of close surveillance. Fibroepithelial polyps are benign and not associated with urothelial carcinoma. Whether they are hamartomatous or neoplastic is not clear, although following excision these lesions do not appear to recur, and follow-up cystoscopies and cytologies seem not to be necessary. However, our follow-up is somewhat limited and longer follow-up may be necessary to more definitively state that fibroepithelial polyps do not recur.

The presence in 1 of our cases of degenerative stromal atypia could also be potentially confused with a malignant mesenchymal neoplasm. In 1 of our cases of fibroepithelial polyp of the bladder occurring in a 3-year-old boy, rhabdomyosarcoma was a consideration on biopsy before the lesion was totally resected.<sup>1</sup> However, this atypia is similar to degenerative atypia occurring within head and neck and vaginal polyps, such that once it is recognized that this atypia can occur in

fibroepithelial polyps, it should not give rise to diagnostic confusion with a malignant mesenchymal neoplasm. Young also noted this phenomenon of degenerative stromal atypia in a case of fibroepithelial polyp of the bladder.<sup>16</sup>

As fibroepithelial polyps of the lower urinary tract in adults are rare, pathologists may mistake these lesions for either reactive or neoplastic conditions. Recognizing the characteristic architectural patterns of fibroepithelial polyps can prevent a misdiagnosis.

## REFERENCES

1. Al-Ahmadie H, Gomez AM, Trane N, et al. Giant botryoid fibroepithelial polyp of bladder with myofibroblastic stroma and cystitis cystica et glandularis. *Pediatr Dev Pathol.* 2003;6:179-181.
2. Asano K, Miki J, Maeda S, et al. Clinical studies on inverted papilloma of the urinary tract: report of 48 cases and review of the literature. *J Urol.* 2003;170:1209-1212.
3. Bolton D, Irby P 3rd. Fibroepithelial ureteral polyps and urolithiasis. *Urology.* 1994;44:582-587.
4. Bruijnes E, Scholtmeijer RJ, den Hollander JC. Congenital polyp of the prostatic urethra in childhood: report of 3 cases and review of literature. *Urol Int.* 1985;40:287-911.
5. Cina SJ, Epstein JI, Endrizzi JM, et al. Correlation of cystoscopic impression with histologic diagnosis of biopsy specimens of the bladder. *Hum Pathol.* 2001;32:630-637.

6. De Castro R, Belloli G, Pavanello P. Solitary polyp of posterior urethra in children: report on seventeen cases. *Eur J Pediatr Surg.* 1993;3:92–96.
7. Downs RA. Congenital polyps of the prostatic urethra: a review of the literature and report of two cases. *Br J Urol.* 1970;42:76–85.
8. Gleason PE. Genitourinary polyps in children. *Urology.* 1994;44:106–109.
9. Hutchinson I, Garland I, Abel BJ. Congenital urethral polyp in an adult. *Br J Urol.* 1983;55:576–577.
10. Kuppusami K, Moors DE. Fibrous polyp of the verumontanum. *Can J Surg.* 1968;11:388–389.
11. Lou ES, Newman H, Levitt SB. Prolapsing urethral polyp in child with hypospadias. *Urology.* 1977;9:423–424.
12. Mattei FM, Del Vecchio MT, Minacci C. Congenital fibroepithelial polyp of prostatic urethra in an adult. *Arch Ital Urol Androl.* 1998;70:173–175.
13. McKenney JK, Amin MB, Young RH. Urothelial (transitional cell) papilloma of the urinary bladder: a clinicopathologic study of 26 cases. *Mod Pathol.* 2003;16:623–629.
14. Miroglu C, Ozdiler E. Congenital urethral polyp in an adult. *Br J Urol.* 1988;61:531–532.
15. Stuppler SA, Kandzari SJ. Fibroepithelial polyps of ureter: a benign ureteral tumor. *Urology.* 1975;5:553–558.
16. Young RH. Fibroepithelial polyp of the bladder with atypical stromal cells. *Arch Pathol Lab Med.* 1986;110:241–242.
17. Walsh IK, Herron B. Benign urethral polyps. *Br J Urol.* 1993;72:937–938.