Urethral Caruncles: A Review of the Literature

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Abstract

Background: Urethral caruncles are benign lesions of the distal urethra which have been most commonly described in post-menopausal women. Over the years, urethral caruncles had been described in women. However, in 2012, Karthikeyan and associates [1] reported a urethral caruncle in a male. Urethral caruncles resemble a variety of urethral lesions including: urethral carcinoma; urethral diverticulum; urethral prolapse; peri-urethral gland abscess.

Objectives: To review the literature on urethral caruncles including: the aetiology, pathophysiology, presentation, investigation and management.

Results: Urethral caruncles quite often originate from the posterior lip of the urethra and they are described as: fleshy out-growths of the distal urethral mucosa. Urethral caruncles are usually small but may grow as large as 1 cm to 2 cm in diameter. A variety of lesions have been reported that mimicked urethral caruncles and some of these include: melanoma of urethra, tuberculosis, urethral leiomyoma, malignancy arising in a urethral caruncle. Conservative treatment is the treatment of choice for most cases of urethral caruncle. This includes: warm sitz-baths, topical oestrogen creams, topical anti-inflammatory drugs. Surgical treatment is reserved for (a) large symptomatic lesions, (b) cases in which conservative treatment has failed to relieve symptoms, (c) cases of uncertainty diagnosis. Complications occurring after excision of urethral caruncle include recurrence, meatal retraction and stenosis.

Conclusions: Urethral caruncles are a fairly common disease, and most cases can be treated conservatively. Nevertheless, carcinoma arising from the urethral caruncle or urethral carcinoma resembling a urethral caruncle has only been occasionally reported. The patient’s condition should therefore, be carefully monitored when using conservative therapy for the management of urethral caruncle. Refractory or large caruncles and caruncules with unusual appearances should be treated aggressively surgically and carefully assessed for the presence of any malignancy or other types of inflammatory lesions including tuberculosis.

Introduction

Urethral caruncles, which quite often originate from the posterior lip of the urethra, are described as fleshy out-growths of the distal urethral mucosa. Urethral caruncles are usually small but may grow as large as 1 cm to 2 cm in diameter [2]. Literature on urethral caruncles has been reviewed in this paper including a discussion of various reported cases on urethral caruncles.

Literature Review

Epidemiology: Sajadi and associates [2] stated that urethral caruncles are rare in the peri-menopausal and pre-menopausal women but common in elderly post-menopausal women. They also stated that urethral prolapses are similar in appearance to urethral caruncles, but are circumferential whilst urethral caruncles tend to be “Focal.” “Urethral prolapses” may occur in both post-menopausal and pre-pubescent women [2]. On the other hand urethral caruncles are seen almost exclusively in post-menopausal women.

Aetiology and Pathophysiology: It has been suggested that the likely first step in the development of urethral caruncle is urethral prolapse caused by urogenital atrophy following oestrogen deficiency [2]. It has also been suggested that chronic irritation as a result of exposure of urethral mucosa contributes to the out-growth, haemorrhage and necrosis of the urethral caruncle [2]. A variety of lesions have been reported that mimicked urethral caruncles and some of these include: melanoma of urethra [3], tuberculosis [4], [5], and urethral leiomyoma [6], [7], [8]. Nevertheless reports of these lesions are rare. In addition Kaneko and associates [9] reported intra-epithelial squamous cell carcinoma arising in a urethral caruncle in 2 patients.

Sajadi and Kim [2] stated that urethral caruncles have been reported:

1. In the premenopausal patient and these may enlarge during pregnancy.
2. Urethral polyps are the paediatric equivalent of urethral caruncles and these may manifest in similar
fashion.

**Presentation:** The majority of urethral caruncles are asymptomatic and are incidentally found clinically during pelvic examinations. The presenting symptoms of other cases of urethral caruncle include: pain in the urethra, dysuria, bleeding or noticing blood in the underpants or undergarments. It has been stated that urethral caruncles are unlikely to explain voiding or storage symptoms [2]. Ozkurkcugil and associates [10] compared lower urinary tract symptoms and urodynamic factors in incontinent women with and without urethral caruncles and they found no differences between the two groups.

Findings on Clinical Examination
Clinical examination most often reveals:
1. A reddish or pinkish exophytic lesion at the external urethral orifice
2. Pursuant to thrombosis, on rare occasions they may look purple or black.

Based upon the above clinical findings the differential diagnosis to consider is urethral carcinoma.

Anatomy of the female urethra: The female urethra is a 4 cm to 5 cm tubular structure which is usually lined by non-keratinized stratified squamous epithelium distally and transitional epithelium proximally. The outer layers comprise of a complex network of smooth muscle and vascular structures.

**Investigations:** Urinalysis, urine microscopy and culture are necessary to exclude urinary tract infection in cases of dysuria, urethral discomfort or urethral pain. In cases when the diagnosis is obvious on clinical examination and there is no haematuria cystoscopy is not necessary. However, cystoscopy is required to rule out more serious pathologies and in cases when the cause of haematuria has not been established. Microscopic examination of the excised urethral caruncle looks like a bed of granulation tissue which is covered by squamous epithelium (in cases of caruncles of the distal urethra) and transitional epithelium (in cases of caruncles of the proximal urethra). Involving of the epithelium may create a papillary architecture and inflammatory infiltration is common [2].

**Medical Therapy:** It has been stated that [2] most urethral caruncles can be treated conservatively by warm sitz-baths and vaginal oestrogen replacement and that topical anti-inflammatory may be helpful. Nevertheless, there is lack of information in the literature on the efficacy of conservative therapy.

**Surgical Therapy:** Surgical intervention is usually the treatment of choice for: patients with large symptomatic lesions; those with un-certain diagnosis; those with induration around the caruncle; in cases of failure to respond to conservative therapy; atypical appearances; or growth over time are indications for excisional biopsy. It has been stated that tumours are found in about 2% of urethral caruncles [2].

Pre-operative Preparations: It has been suggested that standard vaginal preparations and pre-operative antibiotics are required for the surgical management of urethral caruncle [2].

Intra-operative Details: The ensuing intra-operative details have been recommended [2].
1. Cystoscopy should be performed initially to exclude bladder and urethral abnormalities such as: carcinoma, diverticulum and abscess.
2. A urethral catheter should be inserted into the urinary bladder.
3. Stay sutures should be used in the epithelium to prevent mucosal retraction and meatal stenosis.
4. The lesion should be excised.
5. The edges should be oversewn with 3-0 or 4-0 absorbable sutures.

An alternative surgical treatment has been described by Park and Cho [11] for the removal of urethral caruncle and this involves ligation of the base of the caruncle, allowing it to slough off within 1 week to 2 weeks. The Park and Cho procedure does not require anaesthesia or analgesics.

Post-operative management: A urethral catheter may be left in the urinary bladder and removed after 1 to 2 days to allow for appropriate healing of the urethral mucosa.

**Follow-up:** There is no specific follow-up recommended in the literature if the histology of the lesions is reported to be benign.

**Complications:** It has been stated that if the epithelium is not everted with the stay stitch, meatal retraction and stenosis may occur [2].

**Outcome and Prognosis:** It has been stated that the outcome is excellent if the histological examination confirms urethral caruncle and no other pathology [2].
Discussion

Reports of urethral caruncle have appeared in the literature over the last century. Ferrier in 1926 [12] stated that urethral caruncle occurs at any age from 6 years to 90 years. In 1926 Ferrier stated that urethral caruncle is most common in married women of midlife [12]. Ferrier in 1926 stated that Virchow described urethral caruncle as a vascular polyp and John B Murphy described urethral caruncle as a mucous membrane wart. In 1926 Ferrier described the macroscopic features of a urethral caruncle as follows: Grossly it is a vascular tumour, pin-head to raspberry in size, sessile or pedunculated, generally single, located nearly always on the posterior rim of the female urethral meatus. It is red, congested, more so at menstruation, easily bleeding and often exquisitely sensitive. Ferrier also in 1926 [12] stated that histologically urethral caruncle was composed of tufts of capillaries in a fibrous and muscular stroma, infiltrated according to its degree of inflammation with mono and polynuclear cells. No nerve elements had been demonstrated except in the squamous epithelium which is often ulcerated.

Ferrier in 1926 [12] stated that Edward L Young in 1915 reported 19 cases of urethral caruncle, five of which were malignant. Of these, three were traced four to eight years later, and only one had a malignant recurrence. Edward L Young stated that the general experience would not point to so high a proportion of malignancy. Of a larger series in which the removal had been by cautery or excision, one third had benign recurrences. All had noted a large proportion of recurrences.

Ferrier in 1926 [12] stated that Crenshaw reported his clamp and cautery method of removal in 1920 in which out of 118 cases of urethral caruncle, four recurrences occurred. Ferrier [12] suggested that it may be that perhaps because patients lived a distance away from their place of treatment all recurrences may not have been reported. However, Ferrier stated that Crenshaw had confirmed that recurrences were not common many but there were cases in which the growth had recurred again and again.

Ferrier in 1926 [12] stated that the differential diagnoses to be considered were:

a. Prolapsed urethral mucosa, which would be seen to pout completely at the urethral meatus. Moreover, it can be replaced. In cases of urethral prolapse, after a previous operation, the pouting would be irregular, but the replacement should still be possible. Shortening of the urethra may be apparent on endoscopy.

b. Varicosities which are bluish, elastic, and reduce under compression.

c. Condylomata which are warty, multiple, and painless.

d. Cysts of Skene’s glands.

e. Solid tumours of the urethra. Fibromas and carcinomas of the urethra are rare. They are firm and apt to extend up the urethra.

As far back as 1926 Ferrier [12] stipulated that the following conditions must be met in the surgical treatment of urethral caruncles:

a. Complete eradication.

b. Restoration to normal of the urethra, avoiding stricture or pulling down of the bladder neck.

c. Preserving a specimen for histological study.

d. Making the procedure simple, the inconvenience least, and the convalescence shortest.

Ferrier [12] stated that various methods of treatment had been used, but as emphasized by John B Murphy, the essential of all is complete ablation of that part of the basement membrane bearing the “tumour”. If it is left the “tumour” would recur [12].

Young and associates [8] reported six urethral caruncles in women aged 32 years to 82 years (mean age 56 years) which contained atypical stromal cells which raised the concern for neoplasm. The atypical cells varied from spindle to round, the latter, predominating, and typically had scant cytoplasm. A minority of the cells were binucleated and often had prominent nucleoli. A single mitotic figure was found in the atypical cells in one case. The atypical cells were characteristically present in an oedematous background containing numerous inflammatory cells and were focally crowded together in five cases. The differential diagnosis in this case included a florid reactive proliferation of lymphoid cells, but immunohistochemical stains failed to support a lymphoid nature for the atypical cells, and also helped to exclude malignant lymphoma, the neoplasm most often simulated. Because of the invariable additional component of the atypical spindle cells resembling those described in the stroma of the female urinary tract and in polyps in a variety of sites, the round cells likely represented a variant of this mesenchymal cell. Similar round mesenchymal cells have also been documented in the gastrointestinal tract, especially in
the stomach. Immunohistochemical stains in these series showed them to be positive for vimentin in four of four cases and for alpha smooth muscle actin in two of four cases. The prominence of round stromal cells in these cases appeared to be a distinctive feature of urethral caruncles. Young and associates [8] stated that the presence of these cells should not lead to misinterpretation of the lesion to be a neoplastic process.

Kaneko and associates [9] reported a 62-year-old patient who had occasional bleeding from a mass in the urethral meatus. She had been conservatively treated with steroid ointment for one year nevertheless, the bleeding had persisted. The patient was therefore referred for further treatment. A reddish mass measuring 5 mm in diameter was noted at the posterior lip of the urethral meatus. The mass was diagnosed as a urethral caruncle and removed. Microscopically, the squamous epithelium which covered the urethral caruncle, was found to be keratinized, with the proliferation of atypical cells, with swollen nuclei in the entire mucosal layer. The mass was finally diagnosed to be intra-epithelial squamous cell carcinoma arising from the urethral caruncle. Kaneko and associates [9] stated that most cases of urethral caruncle are frequently asymptomatic, but some patients experience a lump or bleeding at the urethral meatus. Pugh [13] stated that the lesion is considered to be neither neoplastic nor pre-neoplastic, but probably result from local trauma or inflammation. Nevertheless, carcinoma (1.6%) and Bowen’s disease (0.8%) are extremely rarely and have been noted in 2.4% of patients with a clinical diagnosis of urethral caruncle [9]. Kaneko and associates [9] also stated that the occurrence of intraepithelial squamous cell carcinoma arising from a urethral caruncle is extremely rare and their search of the English literature revealed only one other cases in addition to their case totalling 2 cases.

Marshall and associates [14] reported that intraepithelial coexisted with “a benign appearing” urethral caruncle in only 1 of 376 patients who a urethral caruncle resection. Conces and associates [15] reported the clinicopathological features of 41 cases of urethral caruncle. They reported that the average patient age was 68 years (range 28 years to 87 years). The presenting symptoms were pain (37%), haematuria (27%), dysuria (20%), in contrast to asymptomatic (32%). The clinical diagnosis favoured malignancy in 10% of cases. Concurrent or subsequent urothelial carcinoma was present for 5 patients (12%), although none developed urethral carcinoma. The reported histologic features included mixed hyperplastic urothelial and squamous lining, overlying a variably fibrotic, oedematous, inflamed, and vascular stroma. Invaginations of urothelium extending into the stroma were common (68%), showing rounded nests with cystic or glandular luminal spaces, similar to urethritis cystic glandularis, without intestinal metaplasia. Two observed lesions included an organizing thrombus, one with intravascular papillary endothelial hyperplasia. Twenty patients were treated with topical medications without resolution. Three lesions recurred (7%) after excision. A subset of patients had a history of smoking or previous pelvic irradiation. They concluded that:

1. Urethral caruncle is an uncommon lesion which may clinically mimic benign and malignant conditions.
2. Awareness of the spectrum of clinical and histological differential diagnoses is important in dealing with this uncommon disease.

Nakamoto and associates [3] reported the case of a 75-year-old woman who complained of a mass at the external urethral meatus. Urethral carunculectomy was performed. The histological diagnosis was amelanotic malignant melanoma. She finally underwent on block resection of urethra including bladder neck, uterus, adnexa, vagina, and vulva. As a urinary diversion, she underwent a continent- chatheterizable stoma with an appendicovesicostomy according to the method described by Mitrofanoff, and a Y-V graft for reconstruction of the vulva.

Raspollini and associates [16] reported a 33-year-old man who presented with a 1.5 cm polypoid lesion at the edge of the external urethral meatus which showed a gross appearance similar to that of a urethral caruncle in the female. The histological features revealed a superficially ulcerated lesion composed of colonic-type mucosal glands with focal regenerative atypia. They stated that this case appeared to be the first reported case of an intestinal-type polyp. The patient had no further problems after the excisional biopsy.

Cimentepe and associates [17] reported 57-year-old female with a urethral lesion that looked like a caruncle , but histological examination of the excised lesion was reported as urethral adenocarcinoma.

Singh and Hemal [18] stated that primary urethral tuberculosis associated with a urethral caruncle is an extremely rare entity and that their reported case was the second of such cases to be reported. They
reported a middle-aged woman who presented with symptoms of frequency dysuria syndrome for 2 years. They also reported that local examination and cystoscopy localized paraurethral induration, tenderness, and urethral caruncle with chronic oblitative urethritis. Trans-vaginal ultrasound scan revealed a solid lesion arising from the posterior urethral wall. Excision of the caruncle and trans-urethral resection of the paraurethral mass lesion revealed chronic granulomatous inflammation with chronic urethritis and fibrocollagenous tissue.

Karthikeyan and associates [1] reported a urethral caruncle in a 60-year-old male labourer. They stated that its occurrence had not been previously reported in the literature.

Atalay and associates [19] stated that Non-Hodgkin’s lymphoma of the female urethra was extremely rare and to their knowledge only ten cases had previously been reported in the literature and their reported case was the 11th case of Non-Hodgkin’s lymphoma of the female urethra presenting as a caruncle.

Conclusions

Urethral caruncle is a fairly common disease, and most cases of urethral caruncle can be treated conservatively. Nevertheless, carcinoma arising from the urethral caruncle or urethral carcinoma resembling a urethral caruncle has only been occasionally reported. The patient’s condition should therefore, be carefully monitored when using conservative therapy for the management of urethral caruncle. Refractory or large caruncles and caruncles with unusual appearances should be treated aggressively surgically and carefully assessed for the presence of any malignancy or other types of inflammatory lesions including tuberculosis.

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