

# A review of the diagnosis and management of urethral caruncles

BY JEN CLARK, LOUISE OLSON AND MAGDA KUJAWA

## Introduction

The innocuous urethral caruncle is the most common benign urethral lesion in females. It can pose a significant challenge to urologists due to the plethora of differentials and poor evidence surrounding management. In 1926, Ferrier eloquently described the macroscopic appearance of a urethral caruncle as “a grossly 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” [1]. More recently (and less interestingly) caruncles have been defined as “a small single quadrant urethral prolapse typically affecting the posterior urethral meatus” [2]. In contrast to Ferrier’s description caruncles are often asymptomatic, but can present with haematuria, bloody discharge, pain, dysuria or obstructive symptoms [3].

The principle challenge with caruncles lies in the diagnosis and the need to exclude more serious lesions. Unfortunately, the list of differential diagnoses is long with multiple pathologies having very similar appearances. Kaneko et al. report 1.6% of excised caruncles contain carcinomas [3] and in a series by Conces et al. the rate of carcinoma was 12% (5/41) [4]. The overall incidence is unknown.

## Aetiology and pathology

The female urethra is typically 4-5cm in length with mucosa composed of non-keratinised squamous epithelium anteriorly and transitional epithelium posteriorly. It is surrounded by layers of smooth muscle and vascular structures and supported by the urogenital diaphragm [5].

Caruncles are most common in post-menopausal women and in some cases pre-pubertal girls [6]. They are thought to arise due to reduced oestrogenisation of urethral smooth muscle leading to lack of support for the urethral mucosa. This urogenital atrophy allows the mucosa of the urethra to prolapse. Chronic irritation of the prolapsed segment leads to inflammation and granulation is thought to contribute to the outgrowth [5,7]. Another theory is that caruncles are an inflammatory process, occurring following recurrent urethritis and other inflammatory processes. Conces et al. who examined 41 excised caruncles describe the histological features as “included mixed hypoplastic urothelium and squamous lining, overlying a variably fibrotic, oedematous, inflamed and vascular stroma” [4].

There are multiple potential differential diagnoses for urethral caruncle, many of which look very similar. In the following table we describe the more common or serious lesions and how to differentiate them.

Differential diagnoses for urethral caruncles

	Lesion	Definition
<b>Benign lesions</b>	Urethral caruncle	A small single quadrant urethral prolapse typically affecting the posterior urethral meatus [2]. They are purple or red in colour, exophytic protrusions of oedematous mucosa which can be friable. They can become thrombosed and may look purple or black [8].
	Urethral prolapse	Smooth red coloured circumferential mucosal protrusion with a ‘donut’ like appearance.
	Urethral polyp	A benign pedunculated lesion which can protrude from the meatus, more commonly in children.
	Para-urethral cyst (Skene’s gland cyst)	A smooth, rounded fluid filled lesion at the urethral meatus. Skene’s glands are an embryological remnant of the female prostate [9]. Situated in the anterior vaginal wall they drain into the urethra. Clearly seen as round fluid filled masses on T2 weighted MRI [10].
	Urethral diverticulum	An outpouching of the urethra with a narrow communicating neck, mostly distal to mid-portion of urethra. The aetiology is unclear but the most common theory is infection / obstruction of a Skene gland leading to rupture of the cyst cavity into the urethral lumen which epithelises to form a true diverticulum [10,11]. The typical textbook presentation are the three Ds: dysuria, dyspareunia and post void dribbling. MRI is used for full assessment.
	Bartholin’s gland cyst	A cystic mass lateral to vaginal introitus caused by blockage of a Bartholin’s gland with rounded smooth, tense underlying skin.
	Condyloma	Warty skin coloured growths around the urethral meatus may be a result of sexually transmitted human papilloma virus (HPV) infection.
<b>Malignant lesions</b>	Urethral carcinoma	Irregular, friable or ulcerated lesion arising from the urethral meatus. May present as a hard palpable mass and lymphadenopathy may be present. Primary urethral cancer is very rare and is four times more common in women and elderly patients. Risk factors include urethral stricture and a history of sexually transmitted infections. More commonly urethral malignancies are spread directly from the bladder or prostate. The most common primary tumour type is squamous cell carcinoma (75%) occurring in the anterior urethra, the rest are transitional cell carcinomas in the posterior urethra or adenocarcinoma, sarcomas or melanomas [8,12,13]
	Bladder cancer	Tumours from the bladder can prolapse down through the urethra, are often papillary in appearance and may be reducible.
	Urethral leiomyoma	Nodular tumour protruding from the urethra and palpable trans-vaginally originating from peri-urethral smooth muscle.
	Vulval cancer	Ulcerated lesion that may be close to but separate from the urethral meatus, irregular in shape and colour, may be friable.



Paraurethral cyst in an adult (image reproduced with permission from Köse O, Aydemir H, Metin O, et al. Experiences with the management of paraurethral cysts in adult women. *Cent European J Urol* 2014;**66**(4):477-80).

### Investigations / diagnosis

Patients will typically present with a range of symptoms and the caruncle may be identified incidentally. Symptoms may include lower urinary tract symptoms including bleeding, pain, dysuria or a mass [2]. Examination involves close inspection of the lesion and bimanual examination. If there are any suspicions, the inguinal lymph nodes should be examined. Investigations may include urinalysis and microscopy and culture. Further investigations will depend on individual symptoms and can include flexible cystoscopy, rigid cystourethrosopy, ultrasound / CT or hysteroscopy. For more complex urethral lesions, MRI can offer additional detail [10]. If there is any suspicion of a malignant pathology tissue biopsy is advocated.

### Management

Most evidence for the management of urethral caruncles comes from case series and case reports with no randomised trials to date. In non-suspicious lesions a conservative approach is first line, which involves no active treatment, sitz-baths, topical oestrogens, topical anti-inflammatories or steroids [14]. Topical oestrogens are effective in low doses as either 10mcg pessaries or topical cream.

Surgical management is reserved for cases with severe symptoms, where conservative management has failed or where the diagnosis is uncertain. Several methods for surgical excision are described in the literature but the key steps include cystoscopy followed by insertion of a urethral catheter. Stay sutures can then be placed in the proximal epithelium to prevent mucosal retraction and meatal stenosis. The lesion can then be excised and the edges over-sewn with 3-0 or 4-0 absorbable sutures [2,14]. The ligation method described by Park and Cho [15] involves placement of a ligature at the base of the caruncle and allowing it to atrophy and fall off over a period of weeks. These authors state that the apparent advantage of this method is that it can be done without general anaesthetic. Following excision, the recurrence rate in one series of 41 cases

was 7% [4] and the complications include postoperative bleeding, urethral retraction, recurrence or urethral stricture [2].

### Follow-up and prognosis

If a urethral caruncle is confirmed then the prognosis is excellent, in the absence of other pathology. There are no specific guidelines regarding the follow-up of urethral caruncles in the literature, however given their benign nature, if more serious pathology has been excluded and symptoms have been adequately treated, then the authors feel no specific follow-up is required.

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### AUTHORS



Jen Clark,

ST3 Urology, Department of Urology, Basquill House, Stepping Hill Hospital.

E: [jenclark@doctors.org.uk](mailto:jenclark@doctors.org.uk)



Louise E Olson,

ST6 Urology, Department of Urology, Basquill House, Stepping Hill Hospital.

E: [louise.olson07@gmail.com](mailto:louise.olson07@gmail.com)



Magda L Kujawa,

Consultant Urologist, Department of Urology, Basquill House, Stepping Hill Hospital.

**Declaration of competing interests:** None declared.

### SECTION EDITOR



Arie Parnham MBChB, FRCS(Urol)

Consultant Urologist, The Christie NHS Foundation Trust, Manchester, UK

E: [arie\\_parnham@hotmail.com](mailto:arie_parnham@hotmail.com)