

# The diagnosis and management of acquired urethral stricture disease

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## Abstract

Urethral stricture disease is a commonly presenting problem to the urologist. Any condition that damages the urethral epithelium or underlying spongy tissue has the potential to cause a stricture. Patients with a urethral stricture can present either acutely or chronically with a range of urinary symptoms. An understanding of urethral stricture disease and a systematic approach to the history and investigations will enable clinicians to manage patients appropriately. This article aims to give an overview, appropriate for surgeons in their early years of training, on the aetiology, presentation and investigation of urethral stricture disease, as well as a basic understanding of the principles of management.

**Keywords** Reconstructive surgery; urethral dilatation; urethral stricture; urethroplasty

## Introduction

Urethral stricture disease is a condition which most commonly affects men and for the purposes of this article we will concentrate solely on the diagnosis and management of male patients with stricture disease. The term 'urethral stricture' generally refers to narrowing of the lumen of the anterior urethra extending from just beneath the external urinary sphincter to the urethral meatus. The condition is a cause of significant morbidity to patients because of the frequent recurrences that can occur after attempts at treatment and there can be significant progression of the condition over a patient's lifetime. This article will detail the causes of urethral strictures, discuss the pathophysiology and then go on to describe presenting symptoms, signs and appropriate investigations. The management will be discussed at the level of a practising general urologist or trainee urologist and will avoid the details of complex reconstructive surgery which would be more relevant for the specialist surgeon. Details of specialist surgery can be obtained elsewhere in reference texts. I would expect that the reader will gain sufficient insight into the causes and management of urethral strictures to be able to manage a patient up to the point of referral to a specialist reconstructive surgeon with confidence.

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## Anatomy of the male urethra (Figures 1–3)

In order to understand urethral stricture disease, the reader needs to understand the basic urethral anatomy including the terms described for the different sections of the male urethra. The first division of the urethra is between the *anterior urethra*, extending from the urethral meatus to the most proximal extent adjacent to the external urethral sphincter and the *posterior urethra* which extends from that point up to the bladder neck mechanism. The anterior urethra is then further divided into three sections: the glanular urethra, penile urethra and the bulbar urethra. The glanular urethra consists of the section within the glans spongiosus of the penis from the meatus to the coronal margin. The penile urethra extends from this point up to the distal extent of the bulbospongiosus and is the longest section of the urethra. The bulbar urethra extends from this point up to the external sphincter and it is surrounded by the bulbospongiosus of the urethra. Occasionally, the term pendulous urethra is used to describe the urethra which sits within the body of the penis from the tip to the penoscrotal junction but this term can lead to confusion and should not generally be used. The posterior urethra is subdivided into the membranous urethra as it traverses the external sphincter mechanism and the prostatic urethra from the site of the ejaculatory duct to the bladder neck.

The urethra is lined by erectile tissue known as the corpus spongiosum and in the penile urethra sits within the centre of this tissue. However, in the bulbar urethra it is eccentrically placed with the bulk of the spongy tissue on the ventral aspect and a very thin layer on the dorsal aspect. The spongiosus is covered with Buck's fascia which also incorporates the corpora cavernosa of the penis up to the penoscrotal junction. The urethra receives its blood supply from several branches of the arterial tree. The bulbar urethral arteries are branches of the internal pudendal arteries and provide antegrade blood flow from the proximal bulbar urethra towards the distal urethra. There is also a retrograde blood flow from the glans spongiosus which is supplied by branches of the cavernosal arteries of the penis and the deep dorsal arteries of the penis. The calibre of the male urethra varies along its length both in its absolute maximum circumference and also in its ability to stretch and increase its circumference. The narrowest part of the urethra is the meatus and sub-meatal region. A typical circumference (usually described as French gauge) of an adult male is around 18–22 mm. The widest and most distensible portion of the anterior urethra is within the bulb where the calibre can be as much as 30 mm.

## Incidence and sex distribution

Urethral strictures are predominantly a disease of men. There are occasional cases of female urethral strictures but it is thought that the incidence is probably no more than 1% of the total number of strictures treated. The absolute incidence is unknown but a reasonable estimate is that 1 in 300 men will get stricture disease in their lifetime. The incidence increases with age but can occur from any time from childhood onwards. A stricture is the most common cause of unexplained lower urinary tract symptoms in a young man. Management of strictures is a common condition in urological practice. In 2014/2015 the number of cases of stricture disease managed operatively was over 9000 across England and Wales.



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