Injuries to the male urethra

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Bulbar urethral trauma The patient usually gives a history of a falling-astride injury , leading to blunt trauma of the perineum. Other common causes include falling from a tree, cycling, skating and indus trial accidents. The bulbar urethra is crushed upwards onto the pubic bone, typically with significant bruising. Clinical features The signs of a ruptured bulbar urethra are perineal bruising and haematoma, typically with a butterfly distribution. There is usually bleeding from the urethral meatus and retention of urine. - - - - - - Management Investigations include a retrograde urethrogram (RGU). A gentle attempt at catheterisation may be made. If the catheter fails to drain urine, a suprapubic cystostomy is performed (Figure 85.5). Delayed anastomotic urethroplasty is performed after 3 /uni00A0 months with excellent success rates.

(b) Figure 85.3 (a) Epispadias in an adult showing a dorsal urethral plate that is open and the meatus opened at the penopubic junction. (b) Dorsal chordee in a patient with epispadias (courtesy of Dr GV Datar, Pune, India).

Summary box 85.3 Bulbar urethral trauma /uni25CF /uni25CF /uni25CF /uni25CF (b) (a) The incidence of posterior urethral injury in pelvic fracture is approximately 10%. These are crush injuries. They are most commonly seen after road tra ffi c accidents. The site of injury is usually the bulbomembranous junc - tion. The bladder with the prostate and membranous urethra is disrupted from the bulbar urethra. The displacement can be both posterior and superior (Figure 85.6). The injury can be partial or complete. Occasionally the injury is complex with bladder neck disruption and rectourethral fi stula. Clinical features Initial treatment includes resuscitation and haemodynamic stabilisation of the patient. Clinical features include blood at the meatus and uri - nary retention. The injury is usually diagnosed on the ultra - sound or computed tomography (CT) scan done as part of trauma management (Focused Assessment with Sonography in Trauma [FAST]). To confi rm the diagnosis an RGU is per - formed (Figure 85.6). If the tear is partial a gentle attempt at catheterisation is made. If urine does not drain, a suprapubic cystostomy (percutaneous or open) is performed. Complex patients may need evaluation with a three-dimensional CT or magnetic resonance imaging (MRI) scan of the pelvis. Emer - gency laparotomy is required for bladder rupture and bladder neck injuries. A diverting colostomy is performed in associated rectal injuries. Treatment In some centres, early endoscopic realignment is attempted. Once the patient is stable, endoscopy is performed from a suprapubic cystostomy . A guidewire is passed from the urethral (c)

Figure 85.4 Urethrogram showing a urethral diverticulum in the penile urethra. The aetiology is usually blunt injury to the perineum Diagnosis is made by urethrography If a catheter fails to drain, suprapubic cystostomy is performed Delayed urethroplasty is the surgical treatment of choice Figure 85.5 (a) Percutaneous puncture of the bladder with passage of a guidewire into the bladder followed by dilatation of the track over the guidewire (b) , thereby allowing placement of a catheter

into the bladder (c) .

meatus and pulled up into the bladder through the haematoma. A Foley catheter is passed over the guidewire. This procedure is challenging and is not always successful. There is an increased risk of infection of the haematoma. If endoscopic realignment is successful, some patients may not need further surgery . Even if it fails, the gap may become shorter and easier to manage with urethroplasty . Delayed anastomotic urethroplasty is the treatment of choice and is performed after 3–6 months. It is a highly challenging procedure and should be undertaken at specialist centres where the surgery has higher success rates. Complications This is common after pelvic fracture with urethral injury . It can be vasculogenic (damage to dorsal arteries) or neurogenic (damage to cavernosal nerves). The erectile function is evaluated by penile Doppler ultra sound. Usually , an intracavernosal injection of a vasoactive agent (papaverine) is given prior to Doppler evaluation. Penile Doppler ultrasound is used to evaluate the velocity of blood flow in the cavernosal and dor sal penile arteries. Patients often recover from ED over a period of time (up to 1 year). Those who fail may require further treatment with oral agents such as sildenafil. If this fails they are treated with self-intracavernosal injection of vasoactive agents, a vacuum device or a penile implant. Incontinence is rare. In complex cases, the injury may a ff ect the prostate–membranous urethra Frederic Eugene Basil Foley , 1891–1966, urologist, Ancker Hospital, St Paul, MN, USA. Christian Johann Doppler , 1803–1853, Professor of Experimental Physics, Vienna, Austria, enunciated the ‘Doppler principle’ in 1842. incontinence. Stabilisation of the fractured pelvis ma y be performed by the orthopaedic team by either external or internal fixation. Summary box 85.4 Pelvic fractures and urethral injury /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF Penile and bulbar urethral stricture Aetiology The common causes of urethral stricture are: /uni25CF lichen sclerosus (LS); /uni25CF iatrogenic (post catheter and/or instrumentation); /uni25CF sexually transmitted diseases (gonorrhoea); /uni25CF post radiation; /uni25CF traumatic; /uni25CF idiopathic; /uni25CF congenital. Pathophysiology Postinflammatory strictures are less common since the introduction of e ff ective antibiotic treatment of gonorrhoea. The stricture is commonly seen in the bulbar urethra. There is infection in the periurethral glands, which persists after inadequately treated gonorrhoea. The infection spreads to cause a periurethritis, which heals by fibrosis. Most strictures appear within 1 year of infection but may not cause di ffi culty in micturition until later. LS (previously known as balanitis xerotica obliterans [BXO]) is a condition characterised by fibrosis of the foreskin, - resulting in phimosis. The glans may be involved and it pres - ents as w hite patches. There can be a meatal stenosis and penile urethral stricture. The cause of the condition is unknown. The majority of studies suggest that it is an autoimmune condition or caused by infection. LS is usually diagnosed by visual inspec - tion but a biopsy will confir m the diagnosis. It is seen in two forms: active and burnt out. Patients usually present with poor flow . A uroflowmetry study followed b y RGU and VCUG can help in making the diagnosis of stricture. The strictures produced are typically long and di ffi cult to treat. Common sites of stricture in LS are penile or panurethral. However, isolated bulbar urethral strictures are also seen in LS .

Figure 85.6 A retrograde urethrogram and voiding cystourethrogram in a patient with a pelvic fracture urethral injury showing the gap. The bladder along with the prostate is displaced upwards and there is a gap between the bulbar urethra and membranous urethra. Erectile dysfunction (ED). Urinary incontinence. Orthopaedic injuries. Suspect a pelvic fracture and associated urethral injury if there is retention of urine or blood at the meatus Diagnostic RGU is performed Partial tears can

be treated with a single gentle attempt at catheterisation Initial management is insertion of a suprapubic catheter Delayed anastomotic urethroplasty has a high success rate in specialised centres

Postinstrumentation strictures following an endoscopy or catheterisation may a ff ect any part of the urethra. Post transurethral resection of prostate (TURP) strictures are seen in the submeatal area, the bulbar urethra or penoscrotal junction. Bladder neck stenosis can occur following TURP and following radical prostatectomy for the treatment of prosta cancer. Clinical features Symptoms are usually hesitancy , poor flow and prolonged voiding time. The patients may complain of recurrent UTIs. Occasionally patients present with urinary retention. Investiga tions include uroflowmetry , urethroscopy , urethrography and ultrasound scanning to assess bladder emptying and to detect any upper tract dilatation. The urinary flow rate is typically prolonged and shows a box pattern (Figure 85.7). RGU and V CUG using a water-soluble contrast medium are performed (Figures 85.8 and 85.9). Urethroscopy is used to assess the stricture intraoperatively (Figure 85.10). Complications These include recurrent UTI, retention of urine, upper tract dilatation, bladder stones and periurethral abscess. Treatment The management of urethral strictures has changed consid erably over the past 25 years. Urethral dilatation is one of the oldest surgical procedures and has been performed for 5000 - years. In the past, serial metal dilators were used under local anaesthesia. The complications include pain, fever, b leeding and false passage creation. Nowadays, dilatation is performed over a guidewire using serial plastic dilators. Dilatation is te particularly e ff ective for soft and short strictures. It is also indicated for unfit patients, patients refusing urethroplasty or those with multiple failed urethroplasties. Urethral dilatation rarely cures stricture and most patients require repeated dilations. - DVIU is performed using an optical urethrotome. The stricture is incised under visual control using a cold knife passed through the sheath of a rigid urethrotome. Alternatively , a laser fibre (holmium/thulium) can be used. DVIU is indicated for short, non-traumatic bulbar strictures but should not be used in the penile urethra or the sphincter active membranous urethra. In self-dilatation, the patient inserts a small-calibre (12/14Fr), usually disposable catheter into the urethra at regular inter - vals. Thus, the patient dilates his own strictur e, but this is not a curative option. Patients who are not willing to undergo - urethroplasty may choose the option of self-dilatation.

(a) 40 35 30 25 20 (mL/s) ura 15 Q 10 5 0 (b) 40 35 30 25 20 (mL/s) ura 15 Q 10 5 0 Void on Figure 85.7 (a) A normal uro /f_l ow pattern. Normal /f_l ow is a bell-shaped curve with a maximum /f_l ow rate of more than 15 mL/s. rate trace from a patient with a urethral stricture. Note the prolonged /f_l ow with the typical box pattern (the vertical lines depict the start and end of micturition). Void off Void on Void off (b) A urinary /f_l ow Direct visual internal urethrotomy (DVIU). Self-dilatation/clean intermittent catheterisation.

There are two types of urethroplasty: anas tomotic and augmentation. Anastomotic urethroplasty is performed for bulbar urethral traumatic strictures where there is a gap in the urethra. This involves dissection of the tw ends of the urethra, spatulation and anastomosis. Augmen tation urethroplasty is performed for non-traumatic and long strictures. In this type of urethroplasty the structured segment of urethra is incised and augmented with a patch (graft). The usual choice of patch material for augmentation urethroplasty - is buccal mucosa. If required, lingual grafts can be harvested from the undersurface of the tongue. The techniques include dorsal onlay augmentation, dorsal inlay or ventral onlay . o - Panurethral stricture This is a long urethral stricture (Figure 85.9

). The aetiology includes LS and iatrogenic causes. The treatment is by

Figure 85.8 (a) A normal urethrogram. (b) An ascending urethrogram showing urethral stricture of the bulbar urethra (arrow). Figure 85.9 Panurethral stricture. Urethroplasty. Figure 85.10 Endoscopic appearance of a urethral stricture with a /f_i breoptic endoscope.

invaginated. The urethra is dissected along the full length on one side and a dorsal onlay buccal mucosa urethroplasty is performed. Use of flaps Preputial and penile fasciocutaneous flaps with their own vascular pedicle can be utilised for complex posterior urethro plasty to bridge long gaps in the urethra and postradiation strictures. Summary box 85.5 Treatment of urethral strictures /uni25CF /uni25CF /uni25CF /uni25CF

A newly diagnosed short bulbar stricture is best treated initially by DVIU Traumatic strictures need anastomotic urethroplasty Long non-traumatic strictures are treated by augmentation urethroplasty Anastomotic urethroplasty has a success rate of around 90%, while augmentation urethroplasty has a success rate of 85% over 10 years. Long-term follow-up is required

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