URETHRAL STRICTURE

Hydrostatic pressure proximal to the obstruction causes dilation of the urethra. The wall of the urethra may become thin, and a diverticulum may form. If the urine becomes infected, urinary extravasation may occur, and periurethral abscess can result. The prostatic ducts may become widely dilated.

Congenital urethral stricture is uncommon in infant boys. The fossa navicularis and membranous urethra are the 2 most common sites. Severe strictures may cause bladder damage and hydronephrosis with symptoms of obstruction (urinary frequency and urgency) or urinary infection. A careful history and physical examination are indicated in patients with these complaints. Excretory urography and excretory voiding urethrography often define the lesion and the extent of obstruction. Retrograde urethrography may also be helpful.

Cystoscopy and urethroscopy should be performed in all patients in whom urethral stricture is suspected. Strictures can be treated with dilation or visual urethrotomy. Single-stage open surgical repair by anastomotic urethroplasty, buccal mucosa graft, or penile flap is desirable if the obstruction recurs.

Acquired urethral stricture is common in men but rare in women. Most acquired strictures are due to infection or trauma. Although gonococcal urethritis is seldom a cause of stricture today, infection remains a major cause—particularly infection from long-term use of indwelling urethral catheters. Large catheters and instruments are more likely than small ones to cause ischemia and internal trauma. External trauma, for example, pelvic fractures can partially or completely sever the membranous urethra and cause severe and complex strictures. Straddle injuries can produce bulbar strictures.

Urethral strictures are fibrotic narrowings composed of dense collagen and fibroblasts. Fibrosis usually extends into the surrounding corpus spongiosum, causing spongiofibrosis. These narrowings restrict urine flow and cause dilation of the proximal urethra and prostatic ducts. Prostatitis is a common complication of urethral stricture. The bladder muscle may become hypertrophic, and increased residual urine may be noted. Severe, prolonged obstruction can result in decompensation

of the ureterovesical junction, reflux, hydronephrosis, and renal failure. Chronic urinary stasis makes infection likely. Urethral fistulas, bladder diverticula and periurethral abscesses commonly develop in association with chronic, severe strictures. If urethral stricture is suspected, urinary flow rates should be determined. The patient is instructed to accumulate urine until the bladder is full and then begin voiding; a 5-second collection of urine should be obtained during midstream maximal flow and its volume recorded. After the patient repeats this procedure 8–10 times over several days in a relaxed atmosphere, the mean peak flow can be calculated. With strictures creating significant problems, the flow rate will be less than 10 mL/s (normal 20 mL/s). Urine culture may be indicated. The midstream specimen is usually bacteria free, with some pyuria, 8–10 white blood cells (leukocytes) per high-power field in a carefully obtained first aliquot of urine. If the prostate is infected, bacteria will be present in a specimen obtained after prostatic massage. In the presence of cystitis, the urine will be grossly infected.

C. X-RAY FINDINGS

A urethrogram or voiding cystourethrogram (or both) will demonstrate the location and extent of the stricture. Sonography has also been a useful method of evaluating the urethral stricture. Urethral fistulas and diverticula are sometimes noted. Vesical stones, trabeculations, or diverticula may also be seen.

INSTRUMENTAL EXAMINATION

Urethroscopy allows visualization of the stricture. Small-caliber strictures prevent passage of the instrument through the area. Direct visualization and sonourethrography aid in determining the extent, location, and degree of scarring. Additional areas of scar formation adjacent to the stricture may be detected by urethroscopy.The stricture can be calibrated by passage of bougies ŕ boule.

Differential Diagnosis

Benign or malignant prostatic obstruction can cause symptoms similar to those of stricture. After prostatic surgery, bladder neck contracture can develop and induce stricturelike symptoms. Rectal examination and panendoscopy adequately define such abnormalities of the

prostate. Urethral carcinoma is often associated with stricture; urethroscopy demonstrates a definite irregular lesion, and biopsy establishes the diagnosis of carcinoma.

Complications

Complications include chronic prostatitis, cystitis, chronic urinary infection, diverticula, urethrocutaneous fistulas, periurethral abscesses, and urethral carcinoma. Vesical calculi may develop from chronic urinary stasis and infection.

Treatment

A. SPECIFIC MEASURES

1. Dilation—Dilation of urethral strictures is not usually curative, but it fractures the scar tissue of the stricture and temporarily enlarges the lumen. As healing occurs, the scar tissue reforms. Dilation may initially be required because of severe symptoms of chronic retention of urine. The urethra should be liberally lubricated with a water-soluble medium before instrumentation. A filiform is passed down the urethra and gently manipulated through the narrow area into the bladder. A follower can then be attached and the area gradually dilated (with successively larger sizes) to approximately 22F. A 16F silicone catheter can then be inserted. If difficulty arises in passing the filiform through the stricture, urethroscopy should be used to guide the filiform under direct vision. An alternative method of urethral dilation employs Van Buren sounds. These instruments are best used by an experienced urologist familiar with the size and extent of the stricture involved. First, a 22F sound should be passed down to the stricture site and gentle pressure applied. If this fails, a 20F sound should be used. Smaller sounds should be used with care, because they can easily perforate the urethral wall and produce false passages. Bleeding and pain are major problems caused by dilation. Dilatation of urethra is not a method of choice today in treatment of urethral stricture cos' formation of restricture is 100% especially in penile urethra. More dilatation performed before definitive tretament, less is succsess.

2. Urethrotomy under endoscopic direct vision

Lysis of urethral strictures can be accomplished using a sharp knife attached to an endoscope, using monopolar, bipolar current or laser energy. The endoscope provides direct vision of the stricture during cutting. A filiform should be passed through the stricture and used as a guide during lysis. The stricture is usually incised circumferentially

with multiple incisions. A 22F instrument should pass with ease. A catheter is left in place for a short time to prevent bleeding and pain. Results of this procedure have been satisfactory in short-term follow-up in 70–80% of patients, but long-term success rates are much lower. The procedure is recomended only in short bulbar strictures (< 1 cm). Second procedure has success about 30-35%.

3. Surgical reconstruction

If urethrotomy under direct vision fails, open surgical repair should be performed. Short strictures (□2 cm) of the anterior urethra should be tcompletely excised and primary anastomosis done. If possible, the segment to be excised should extend 1 cm beyond
each end of the stricture to allow for removal of any existing spongiofibrosis and improve postoperative healing. Strictures >2 cm in length can be managed by patch
graft urethroplasty. The urethra is incised in the midline for the full length of the stricture plus an additional 0.5 cm proximal and distal to its ends. A full-thickness skin graft is obtained—preferably from the penile skin or buccal mucosa—and all subcutaneous tissue is carefully removed. The graft is then tailored to cover the defect and meticulously sutured into place. In very long, densely fibrotic strictures, the distal penile fasciocutaneous flap technique has been successful in >80% cases. This single-stage procedure can be combined with buccal mucosa grafting in panurethral strictures. In adults, grafts from buccal mucosa or penile skin should be applied with an onlay technique in the bulbar region of the urethra to maximize graft vascularization from the corpus spongiosum. Strictures involving the membranous urethra ordinarily result from external trauma and present problems in reconstruction. Most can be corrected by a perineal approach with excision of the urethral rupture defect and direct anastomosis of the bulbar urethra to the prostatic urethra. At times, partial pubectomy from the perineal approach can be done to improve urethral approximation without tension on the anastomosis. Rarely, total pubectomy combined with the perineal approach is required to accomplish the direct end-to-end anastomosis. These single-stage procedures have a high success rate and create a

urethra free of hair a major problem seen with 2-stage procedures. Although seldom required, 2-stage procedures are important reconstructive techniques to be considered in complex urethral strictures. A stricture should not be considered “cured” until it has been observed for at least 1 year after therapy, since it may recur at any time during that period. Urinary flow rate measurements and urethrograms are helpful to determinethe extent of residual obstruction. Oral mucosa is currently considered the substitution material of choice for reconstruction of urethral stricture. The first operation is likely to be the most successful. Use the simplest technique that is likely to be effective. Grafts more commonly used than flaps, with similar efficacy. Initial treatment should be used only in selected cases. Broad expertise in great variety of surgical techniques warrants better opportunity for successful outcome. There is no significant difference in outcome between a ventral, lateral, or dorsal approach to augmentation urethroplasty. Tube substitution procedures and use of scrotal skin should be avoided.

True organic stricture of the adult female urethra is not common. (Functional urethral obstruction is more common.) It may be congenital or acquired. The trauma of intercourse and especially of childbirth may lead to periurethral fibrosis with contracture, or the stricture may be caused by the surgeon during vaginal repair. It may develop secondary to acute or chronic urethritis. Persistent hesitancy in initiating urination and a slow urinary stream are the principal symptoms of stricture. Burning, frequency, nocturia, and urethral pain may occur from secondary urethritis or cystitis. If secondary infection of the bladder is present, pus and bacteria will be found in the urine. A fairly large catheter (22F) may pass to the bladder only with difficulty. Panendoscopy may demonstrate the point of narrowness and disclose evidence of urethritis. Cystoscopy often reveals trabeculation (hypertrophy) of the bladder wall.

Chronic cystitis may cause similar symptoms, but urinalysis reveals evidence of infection. Cancer of the urethra causes progressive narrowing of the urethra, but induration and infiltration of the urethra are found on vaginal examination. Panendoscopy with biopsy establishes the diagnosis. Vesical tumor involving the bladder neck causes hesitancy and impairment of the urinary stream. Cystoscopy is definitive. Chronic urethritis commonly accompanies urethral stenosis; either may be primary. Recurrent or chronic cystitis is often secondary to stenosis. Treatment consists of gradual urethral dilatation (up to 36F) at weekly intervals. Slight overstretching is necessary, since some contracture will occur after therapy is discontinued. Measures to combat urethritis and cystitis also must be employed. Internal urethrotomy has its proponents (Essenhigh, 1968). With proper overdilatation of the urethra and specific therapy of the urethritis that is usually present, the prognosis is good.