

URETHRAL STRICTURE IN FEMALE

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ABSTRACT

We report a female, 18 years old, who was stricken down by a tree and subsequently brought to the emergency room in Dr Soetomo Hospital in September 1997. She was diagnosed with total bladder rupture, urethral rupture, unstable pelvic (caused by four rami pubic fracture, sacroiliac disruption), left ovarian rupture, total vaginal rupture, partial rectal rupture and she underwent several operating procedures. Five years later, she visited Urology Outpatient clinics and was diagnosed with total urethral stricture, the cystostomy catheter was still fixed into her bladder. She subsequently underwent symphysiotomy and urethroplasty. After 10 days post operation, the patient was discharged from the hospital with the urethral catheter maintained until 1.5 months and the cystostomy catheter was replaced with a new one every 2 weeks. Three months after urethroplasty the patient has been able to void spontaneously. Residual urine examination showed no residual, so that the catheter was removed. Independent catheterization is still done with tapering dose to once a week for about 6 months after urethroplasty, Uroflowmetry was examined with the results as follows: maximum flow rate 14.1 ml/s, average flow rate 5.6 ml/s, voided volume 169 ml, flow time 30 s, voiding time 52 s, time to max. flow 11.1 s, acceleration 1.3 ml/s, and hesitancy 3.7 s.

Keywords: urethral stricture, urethroplasty

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INTRODUCTION

Urethral stricture in female, especially caused by urethral injury, is rare due to short length, mobility and lack of attachments to the pubic symphysis. When it does occur, it is commonly a partial, anterior and longitudinal laceration. In extreme cases, varying degrees of complete avulsion can also occur, as well as associated vaginal laceration and pelvic fracture. A retrospective chart review identified urethral injury to accompany pelvic fracture in approximately 5 % of female patients.

CASE REPORT

Female, 18 years old, visited Urology Outpatient Clinic, Dr Soetomo Hospital, with a complaint of voiding disability through the urethra since 5 years 5 months ago. Urination is done through cystostomic catheter. Previous history of the patient was as follows: in September 3, 1997, the patient was stricken down by a tree, and was brought to Emergency Unit, Dr Soetomo Hospital, Surabaya. The diagnosis at that time was total bladder rupture (encircling next to the bladder neck), which was overcome with bladder repair. Urethral rupture was overcome using urethral approach and

suprapubic cystostomy. The pelvis was unstable due to the fracture of four rami pubic and sacroiliac disruption was handled by installing C-clamp. One week later a plate was fixed up in pubic symphysis, the rupture of sinister ovary was handled with sinister salphingooverectomy, vaginal laceration was done with vaginal repair, and partial rectal rupture was handled with rectal repair and sigmoidostomy. Eight months later sigmoidostomy closure and plate removal was done, and one month thereafter vaginocutaneous fistule emerged and were subjected to debridement and fistulectomy. Five years after the accident, the patient experienced vaginal synechia and the presence of bladder stone, and the patient underwent vaginal repair and lithotripsy. It was planned that 4 months after the last operation, urethral reconstruction would be carried out. Physical examination revealed adequate general condition. General status was normal, cicatrix of previous operation was found in abdominal area. Urologic status in urinary vesicle showed the presence of cystostomic catheter no. 20 Fr, urine flowed normal and clear. External genitalia revealed that vulva, urethral meatus, and DRE were normal. The results of laboratory examination were as follows: Hb 14.0 g/dl, leucocyte 6.3×10^3 /ul, thrombocyte 935×10^3 /ul, LED 35 mm/hour, hemostatic function was normal, BUN 8 mg/dl, creatinine serum 0.71 mg/dl, SGOT 18 U/l,

SGPT 9 U/l, direct bilirubin 0.10 mg/dl, total bilirubin 0.83 mg/dl, Albumin 5.4 g/dl, complete urine: erythrocyte -, leucocyte 8-10, epithelium 2-4, urine culture: *Escherichia coli* +, sensitive with fosmycin, cefotaxim, sulbactam, cefipime and meropenem.

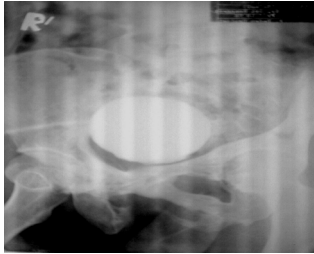


Figure 1. Bipolar voiding urethrocytography shows total urethral stricture

Thoracic foto was in normal range, and bipolar voiding urethrocytography revealed pars posterior total urethral stricture. From those results the patient was diagnosed with total urethral stricture. At day 9 of the treatment urethroplastic operation was done with the following steps:

1. Urethroscopy using sheath No. 21, optic 30° showed urethra of 3 cm length, totally blocked. It was followed with exploration and surgical preparation: RL infusion, antibiotic injection cefotaxim 1 gr as prophylaxis.
2. The patient was positioned lithotomy and supine
3. Operation field was disinfected with betadine.
4. Sectio alta incision revealed wide cycatrix tissue, bladder attached to surrounding tissues.
5. Bladder was opened, showing that bladder neck was absent.
6. Orthopaedist underwent symphysiotomy. It was found that the bone was not maximally free.
7. Lower urethral catheter was installed, the length from EUM (external urethral meatus) was 3 cm.
8. The bladder was opened and connected with distal urethra, and silicon catheter split No. 18 was placed,
9. Cystostomy catheter No 20 was set up



Figure 2. The patient before operation



Figure 3. Vagina is normal, external urethral meatus is apparent

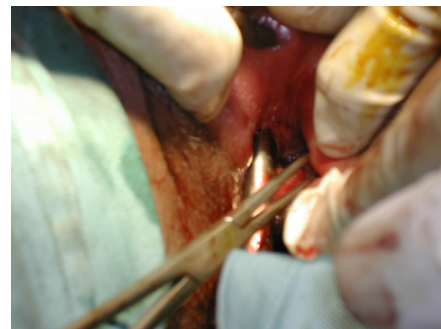


Figure 4. The placement of lower urethral catheter from EUM, 3 cm length



Figure 5. The bladder was opened and connected to distal urethra, splitted with silicon catheter No 18

During her stay, the patient received injections of cefotaxim 3 x 1 gr dan novalgin 3 x 1 vials, urine production for 3 days (from cystostomy catheter to urethral catheter): 1700 cc clear, 1500 cc clear, 1800 cc clear. Cavum retzii drain was removed at day 10. Ten days postoperatively, the patient was allowed to discharge in a good general condition. Urethral catheter was maintained for 1.5 months and cystostomic catheter was replaced with the new one each 2 weeks.



Figure 6. Two weeks after operation, the cystostomy catheter is replaced.

After urethral catheter was removed, the patient was trained for independent catheterization (Clean Intermittent Self-Catheterization (CIC)), twice a day morning and afternoon. Each visiting time the patient demonstrated her ability to do independent catheterization before the doctor. Two months after operation, she was able to urinate from urethra with closed cystostomy catheter and no history of urination through the vagina and no history of enuresis. Uroflowmetry was examined with the results as follows: maximum flow rate 9.6 ml/s, average flow rate 4.8 ml/s, voided volume 259 ml, flow time 54 s, voiding time 77 s, time to max. flow 24.7 s, acceleration 0.4 ml/s, and hesitancy 12.6 s. Urine residual examination showed no urine residue. Three months after urethroplasty the patient has been able to void spontaneously. Residual urine examination showed no residual, so that the catheter was removed. Independent catheterization is still done with tapering dose to once a week for about 6 months after urethroplasty. After 6 month Uroflowmetry was examined with the results as follows: maximum flow rate 14.1 ml/s, average flow rate 5.6 ml/s, voided volume 169 ml, flow time 30 s, voiding time 52 s, time to max. flow 11.1 s, acceleration 1.3 ml/s, and hesitancy 3.7 s. Bipolar voiding urethrocystographic examination revealed remarkable urethral widening, no urethral stricture and no contrast extravasation was apparent. Cystoscopic examination using sheath No 17 and optic 300 a view showed that urethral ostium was unclear, bladder volume was small (< 100 ml) and residual urine was 30 ml.

DISCUSSION

Urethral stricture is the constriction of urethral lumen due to the formation of fibrotic tissue, which consisted of collagen and fibroblast. Stricture may occur due to infection, trauma or congenital abnormality (McAninch

2000). Urethral trauma in female is notably rare as the urethra in female is short, mobile, and less attached to pubic os symphysis (Brandes 2001). Therefore, the occurrence of urethral stricture in female due to trauma is also rare. Anatomically, the length of urethra in female is about 4 cm and it has a hanger, i.e., pubourethral ligament, which is consisting

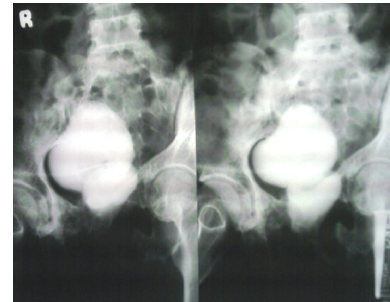


Figure 7. Bipolar voiding urethrocystography 2 months after operation



Figure 8. Remarkable urethral widening. Urethral stricture and contrast extravasation are absent.

of anterior (ligamentum suspensorium clitoris), posterior (ligamentum pubourethral from fascia endopelvic) and intermediate parts (connecting anterior and posterior parts) (Brooks 2002). Urethral trauma in female generally presents as partial, anterior, and longitudinal laceration. In severe cases, complete avulsion may occur, accompanied with vaginal laceration and pelvic fracture (Brandes 2001). Retrospective studies showed that urethral trauma connecting with pelvic fracture occurs about 5% in female patients (Zinman 2001).

The objective of urethral reconstruction is to eliminate obstruction in urinary tract, to eliminate pain, and to obtain sufficient urethral length to prevent voiding into the vagina. There are two main indications for surgery, i.e., urethral obstruction and sphincteric incontinence.

However, the time of operation remains controversial. For several decades the operation is undertaken 3 - 6 months or more until tissue inflammation and edema disappear. There is also opinion that the operation can be carried out immediately after vaginal wound is free from infection and inflammation, and the tissue has become pliable, usually 3 - 6 weeks after trauma. Surgical principles that should be noticed are clear operation field, no tension, all layers are stitched, adequate blood flow and bladder drainage (Blaivas 1998). In addition, the success of reconstructive procedure depends on adequate tissue condition, no inflammation, cancer, or foreign bodies (Guerriero 1983).

There are three basic approaches to urethral reconstructive operation, i.e.: anterior bladder flaps, posterior bladder flaps and vaginal wall flaps. These techniques are aimed to create a new urethra. If bladder neck and proximal urethra are involved, there will usually be post-operative incontinence complication. Three basic techniques for urethral reconstruction are as follows (Blaivas 1998).

1. Primary closure

If the anterior part of the urethra is intact, it can be closed primarily. In well-defined defect, flap is constructed at vaginal lateral wall and elevated. Urethral lateral wall is freed, and the urethra is stitched interruptedly with chromic cut gut 3-0 and vaginal wall is closed.

2. Advancement flap

If the tissue in vaginal anterior wall is insufficient, first, U section is made and extended downward as planned to reach the site of urethral meatus. The flap is elevated and turned 180 degree. Flap is stitched at the edge of distal section parallelly above the catheter to construct a new urethra. Vaginal wall is brought closer to the midline to close a new urethra with chromic cut gut 2-0.

3. Tube graft

If urethra is missing circumferentially while vaginal anterior wall tissue remains sufficient, a section is made on the site of new urethra so that it produces sheath encircling the catheter, forming a shape of a tube. In this case, there was a history of severe trauma, in which there was a remarkable damage in internal organs, such as total bladder rupture, urethral rupture, the fracture of four rami pubic, sacroiliac disruption, sinister ovarian rupture, total vaginal rupture and partial rectal rupture. The treatment at the moment was emergency. After the

bladder being repaired, the urethra was brought closer and suprapubic cystostomy was undertaken. The possible complication in such condition is urethral stricture. The treatment for urethral reconstruction is the last action taken after all problems in the patient has been overcome, as there has been alternative for urine secretion through cystostomic catheter and to obtain maximum results after the patient's condition is optimum. It was expected that four months after the last vaginal repair, surgical wound would heal, no infection and inflammation, while the tissue will have become pliable.

Regarding the surgical method, exploration followed with urethroplasty by connecting the bladder to distal urethra is regarded as the best choice for this case since we could directly see the condition of urethral stricture. Vaginal flap technique was not possible as the patient had just undergone vaginal repair. The technique to connect bladder to urethra was also done by Tanagho EA in bladder neck reconstruction in total urine incontinence as in Figure 9 (Blaivas 1998).

After 1.5 months post urethroplasty, urethral catheter was removed and the patient was trained to perform independent catheterization twice a day, in the morning and afternoon. The procedure was indicated as the patient cannot empty her own bladder as in normal condition. First, the patient was trained by the doctor or nurse in modified lithotomic position using a mirror before herself so that labia, clitoris, urethral meatus and outer part of the vagina can be seen. Then, the patient was given with Robinson 14F catheter and asked to insert the catheter from urethral meatus into the bladder until urine can be secreted. Independent catheterization in woman can be done by sitting on the closet or standing. Catheter sterilization and the use of sterile gloves during independent catheterization are not necessary, but to keep it clean and prevent bad smell, the patient should wash her hands and clean the catheter with soap.

Three months after urethroplasty the patient has been able to void spontaneously. Residual urine examination showed no residual, so that the catheter was removed. Independent catheterization is still done with tapering dose to once a week for about 6 months after urethroplasty.

CONCLUSION

Urethral stricture in women due to urethral trauma is uncommon as the trauma itself is rare because urethral

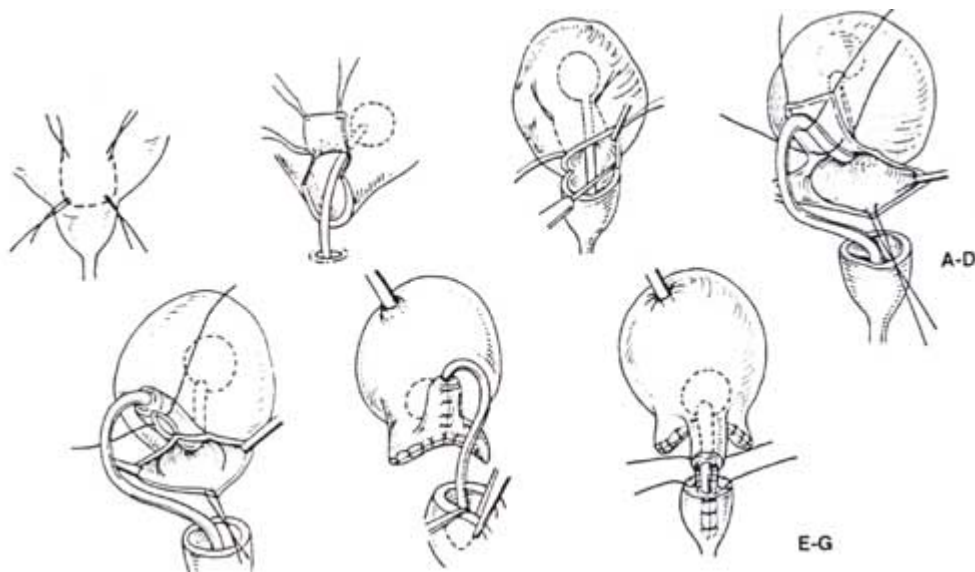


Figure 9. Urethroplasty using anterior bladder flap

anatomy in woman is short, mobile, and less attached to os symphysis. This case represent a severe trauma, in which there was total bladder rupture, urethral rupture, the fracture of four rami pubic, sacroiliac disruption, total vaginal rupture, left ovarian rupture, partial rectal rupture. Therefore, the treatment was emergency and less optimum, resulting in various complications, such as urethral stricture. Urethroplasty by exploration and connecting the bladder with distal urethra was an ideal choice in this case, as the stricture can be clearly observed directly. Vaginal flap was impossible since the patient had just had vaginal repair due to vaginal synechia. Independent catheterization is an important procedure in supporting the success of urethral stricture after urethroplasty. It depends also on the discipline of the patient to comply with the doctor's instruction.

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