

VESICONEOURETEROPLASTY—A SOLUTION FOR URETEROVAGINAL FISTULA

(A Case Report)

by

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The renal and the genital tracts are so intimately related embryologically and anatomically that they cannot be separated from each other. As quoted by Millin (1949) these two specialities cannot be made watertight compartments. Urinary fistula is the worst type of affliction that a woman can suffer from. Serious damage to the urinary tract, particularly the ureter, during pelvic surgery is a serious misadventure. Severance or occlusion of the ureter cannot be avoided at times, in spite of the greatest care and skill adopted by the surgeon. Increasing usage of total hysterectomies for benign conditions and radical and ultraradical surgical procedures for malignancies account for an ever increasing number of ureteric fistulae. Bunkin (1965) reports the incidence to be 0.5 to 3.0 per cent for benign conditions, whereas Higgins (1967) reports the figures as quoted in Wertheim's series as 10%, Sampson's 1.5%, Newell (1939) 0.4%, St. Martin's (1953) 2.42% without

lymph node dissection and Meig's 9% in malignant conditions.

The ureter in its pelvic course is intimately related with the ovarian and uterine vessels, the lower margin of the broad ligament and the corner of the vagina (Jeffcoate 1967). Of the different types of injuries to the ureter like ligation, angulation, partial or complete crushing, puncturing, partial or complete severance of the ureter, fistula formation is the commonest as a result of stripping of the periureteral sheath. The pathogenesis consists of necrosis of the ureter following inadvertently placed sutures, crushing or loss of tonicity subsequent to denudation or stripping of the ureter. The vaginal leak appears in about one to three weeks time (Lazarus 1965). On the other hand, the post inflammatory fibrotic strictures of the ureter result in hydronephrosis followed by hydronephrosis with irreparable loss of renal function which is aptly described as "Silent Renal Death." The venial sin is injury to the ureter but the mortal sin is failure of its recognition. The ideal time of recognition of ureteral injury is at the time of the operation, since primary repair by end to end anastomosis or ureteroneocystostomy with proper drainage will be easy and prevent further

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Received for publication on 12-1-72.

pathological events. Earlier the repair, the more the chances of salvage of the kidney. The physiological continuity of the renal tract, that is the ureter draining into the bladder, will definitely give good results. Tilak *et al* (1964) suggest that the solution to the problem of bridging the gap between the proximal healthy ureter and the bladder which has always tickled the imaginative minds and conduits from blood vessels, tubes of mesentery peritoneum and fallopian as well as other metallic tubes had been tried with no success. (Melnikoff 1912).

Historical Background

On the analogy similar to Janeway's gastrostomy by raising a tubular flap from the bladder to communicate with the ureter, it was Van Hook (1893) who tried this operation on a cadaver. Boari (1894), an Italian Surgeon, did this operation on a dog who survived the operation for four years but the actual anatomical result could not be assessed as no autopsy was performed after the death of the dog.

Spies *et al* (1933) tried to evolve the operation for reconstruction of the ureter from a bladder flap referring to the work of previous workers, but the details are not available. It was in 1947 that this operation was done by Ockerblad for the first time on a human being. Conger and Rouse (1955) replaced about 14 cms. length of ureter by a bladder flap.

A case of ureterovaginal fistula is reported below in whom this operation was done at the Government Medical College Hospital, Nagpur, successfully.

Case Report

N.L.M., 50 years old Hindu female was admitted on 20-7-70 with a history of dribbling of urine for the last five months following a total hysterectomy with right salpingo oophorectomy for fibroid uterus in a

district hospital. Patient had one full term normal delivery 23 years back and regular normal menstrual cycles till nine months before the operation. She had menorrhagia and was diagnosed as fibroid uterus for which she was operated. The immediate postoperative period was uneventful, except for dribbling of urine per vaginam from seventh day onwards. The abdominal wound had healed well. Pelvic examination at the time of discharge did not reveal any fistula or granulation tissue, but there was collection of urine in the vagina. The patient was referred to Medical College Hospital, with the diagnosis of ureterovaginal fistula for further treatment. The diagnosis was confirmed by methylene blue test. Intravenous pyelogram showed hydronephrotic changes on the left side with stenosis of the left ureter in its pelvic course.

Investigations Done

Hb—65%, TLC—7500/cmm, DLC—poly 70% lympho—26%; eosino 4%. Blood Urea—55 mgs%.

Urine—Sugar — nil, albumin — nil, few pus cells and epithelial cells present.

Urine culture shows B. Proteus sensitive to Chloromycetin. I.V.P. Hydronephrotic and hydroureteric changes on the left side.

On 24-8-70 Boari flap operation was performed after opening the abdomen by a vertical suprapubic incision. Pelvic cavity was explored. Adhesions were found involving the left ureter. Left tube and ovary were tortuous and adherent to the vault of the vagina and the lower end of the ureter. The adnexa was excised. The left ureter was identified, isolated and transected just above the level of the ischial spine

The bladder was distended by injecting sterile water through a Foley's catheter per urethra. It was mobilized extraperitoneally on the sides and anteriorly. A 2½" long and ¾" wide rectangular flap was raised on the supero-anterior surface of the bladder with its base on the left side of the dome of the bladder as shown in Fig. 1. A small opening was made near its free end through which the cut end of the ureter was delivered on to the mucosal

surface of the flap. A polyethylene tube was introduced into the ureter proximally for a distance of 6-8 cms., and brought out through the urethra. The ureteral edge was fixed to the mucosa of the bladder flap by interrupted No. 0000 chromic catgut sutures on a atraumatic needle. The polyethylene tube was fixed to the bladder mucosa by a catgut stitch. The tube of the bladder flap was completed by suturing the mucosa with No. 0000 chromic catgut continuous stitch, the muscle and serosa with No. 00 chromic catgut with interrupted stiches. The free edge of the tube was fixed to the serosa of the ureter by a few interrupted sutures. The bladder was closed by double layer of chromic catgut stiches and made extraperitoneal. Abdominal incision was closed in layers after putting in a corrugated drain in the cave of Retzius. Ryle's tube aspiration was done for 48 hours, bladder was drained by Foley's catheter and the left ureter by a polyethylene tube which were fixed to each other by thread.

Postoperatively the patient was put on Chloromycetin, Vit. B-Complex, Vit. C, & I.V. fluids for the first 48 hours. Corrugated drain was removed on the fourth day, polyethylene tube on the twelfth day and Foley's catheter on the seventh day. The patient had mild pyrexia and wound sepsis. The wound healed after secondary suture.

The patient was reviewed six months after the operation clinically. Her intravenous pyelogram now showed a normally functioning kidney and ureter on the left side. Cystogram showed absence of ureteral reflux on the left side. Urine showed no pus cells.

Comments

The ideal treatment when the lower one third of the ureter is damaged, is to reimplant the healthy proximal end of the ureter into the bladder. This is not attainable in all the cases and not possible if there is loss of more than one inch of the terminal part of the ureter (Howkins 1961). The ureter may be mobilized at or even above the pelvic brim and may be transplanted into the colon for which

many techniques have been devised (Mil-lins (1948). This is associated with electrolyte disturbances, progressive renal insufficiency due to obstruction and infection and regurgitation of colonic contents into the renal tract (Pyrah-1954). Nesbit (1960) solves the problem to some extent by making an ileal bladder. Takayusu and Sato (1961) have tried this operation successfully for idiopathic dilatation of the ureter successfully.

So far as the technique is concerned Kimchi *et al* (1953) have suggested an extraperitoneal approach. Scott and Russel (1947) are not particular about direction of flap, nor the dimension or shape of the flap. The flap should not be very narrow and produce a tube of small diameter, less than 1/2", as otherwise there would be ureteral obstruction.

The polyethylene tube may be kept to drain the ureter and keep the ureter draining per urethra, in which case it can be pulled out, but it may be kept lying free in the bladder for about an inch when it is removed by a Braasch cystoscope.

Summary

The incidence of ureteral damage in its pelvic course is on the increase since total hysterectomies are preferred to subtotal hysterectomies for benign pelvic conditions and radical and ultraradical surgical procedures are becoming popular for malignant conditions, which include extensive ureteric dissection as an essential step.

If the ureteral injury is not detected at the time of primary surgery it should be diagnosed and repaired as early as possible to prevent irreparable loss of function of the kidney.

Of all the reparative procedures Boari-flap repair claims to restore the vesico-

ureteric anatomy and physiology very close to a normal state.

It is a quick and a safe operation and free from risk of development of urinary fistula, since it does not involve dissection, denudation or devascularization of the ureter, as in transplantation of the ureter into the colon.

Authors make a plea in favour of Boari-flap operation for cases of ureterovaginal fistula as there is an ever increasing scope for trial of this operation.

Acknowledgement

We are very much thankful to Dr. V. B. Pathak, M.S., F.R.C.S, Dean, Medical College, Nagpur for allowing us to publish this case and also to Dr. Mrs. R. B. Survey, Professor of Obstetrics & Gynaecology.

References

1. Albert, J. and Paquin Jr.: J. Urol 82: 573, 1959.
2. Bunkin, I. A.: Clin. Obst. & Gynec. 8: 383, 1965.
3. Boari—as quoted by Ref. No. 22.
4. Conger, K. and Rouse, R. U.: J. Urol. 74: 485, 1955.
5. Everett, Houston, S.: Gynaecological & Obstetrical Urology, ed.-2, Williams & Wilkins Co. (1947), pp. 513-524.
6. Higgins, C. C.: J. Am. Med. Assoc. 82: 199, 1967.
7. Hook, Van, W.: J. Am. Med. Assoc. 20: 911, 965, 1893.
8. Hawkins, J.: Shaw's Textbook of operative gynaecology ed.-2, Livingstone E & S, 1961, p. 431.
9. Jeffcoate, T. N. A.: Principles of Gynaecology, ed.-3, London-Butterworths, 1967, p. 49.
10. Kimchi, D. and Wiesenfeld, A.: J. Urol. 89: 800, 1963.
11. Landau, S. J.: J. Urol. 87: 343, 1962.
12. Lazarus, O.: Cl. Obst. & Gynec. 8: 413, 1965.
13. Melnikoff, A. E.: Quoted by Basu Mallik M. K., J. Obst. Gynec. Brit. Cwlth. 68: 688, 1961.
14. Millins, T.: Proc Roy Soc. Med. 42: 37, 1949.
15. Nesbit, R. M.: J. Urol. 84: 691, 1960.
16. Ockerblad, N. F.: J. Urol. 57: 845, 1947.
17. Pyrah, L. N.: Ann. Royal Coll. Surg. Eng. 14: 169, 1954.
18. Scott, C.: J. Obst. & Gyn. Brit. Emp. 63: 481, 493, 1956.
19. Spies, J. W., Johnson, C. E. and Wilson, C. S.: Proc. Soc. Exp. Biol. Med. 30: 425, 1933.
20. Takayasu Hisao and Sato Shotaro: Urologia Trenso. 18: 301, 1961.
21. Thomson, I. M., Karow, W. F. and Ross, G. Jr.: J. of Urol. 102: 308, 1969.
22. Tilak, G. H., Narvekar, M. R. and Desa Souza, J. M.: J. Obst. Gynec. India. 14: 143, 1964.

See Fig. on Art Paper IV