

Eckstein's Ureterocystoplasty: Notes

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In the spring of 1972 Herbert Johnston and Herbert Eckstein attended an international symposium in Halle, then in the German Democratic Republic. The meeting was dedicated to the study of Posterior Urethral Valves and the participants discussed relative problems at length over a couple of days (1). Therapeutic options were limited, much as they are today, and surgical arguments centered around the Bricker and Hendren operations. The role of bladder augmentation in the management of children born with valves was not generally appreciated (2). Herbert Eckstein proposed a synthesis, in a sense, by introducing his "uretero-cystoplasty" to the pediatric urological repertoire right after this event (3).

Eckstein's operation of augmenting the bladder with an associated megaureter has only recently been discovered and is currently being practiced in a number of surgical centers (4-16). The procedure has been hailed as a novel approach in the case of renal failure (17,18). The first employment of this procedure for such an indication, however, detailed by Herbert Eckstein himself in a report published in German was long overlooked (19).

The original presentation and a fortuitous 22-year follow-up are summarized here:

The first ureterocystoplasty operation was performed at the Queen Mary's Hospital for Sick Children, Carshalton, on May 4th 1972. The baby who subsequently underwent this operation had presented at 3 weeks with symptoms of metabolic disturbances. His bladder and kidneys were palpable. A suprapubic cystogram demonstrated posterior urethral valves and bilateral nephrostomies were raised as an emergency. Once the baby's condition stabilised transurethral resection of valves and remodelling and reimplantation of both ureters were undertaken at 4 weeks of age.

A second cystogram at three months showed a

highly contracted bladder with persistent bilateral vesico-ureteric reflux. By 7 months the patient had lost all function in his left kidney; the hydro-ureteronephrosis on the right side was mild. Under these circumstances Mr. Eckstein carried out a left nephrectomy and a ureterocystoplasty with the left ureter using a technique that is widely emulated today (Fig. 1).

The original description shows that the procedure was carefully planned and executed: the ureter was dissected down to the bladder after the kidney, pel-

256 (1973) H. B. Eckstein, M. A., M. D., M. Chr., F. R. C. S., M. R. R. Martin, F. R. C. E.

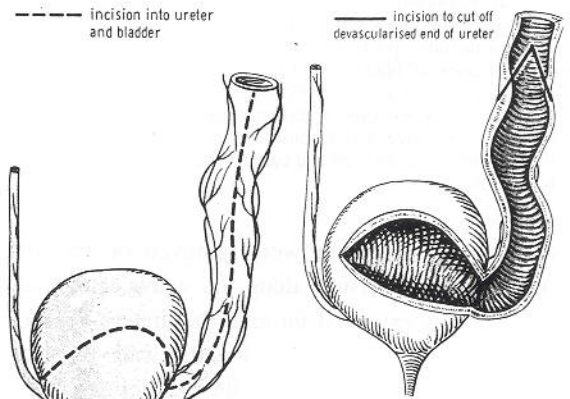


Abb. 2

die Ureterwand in den Blasendefekt eingepaßt und mit der Blasenwand durch 000 Catgut-Einzelknopfnähte vernäht (Abb. 4). Die Blase wird durch einen Malecot-Katheter außerhalb der Anastomose nach drainiert, ein weiteres Drain liegt prävesikal. Letzteres wird nach 48 Stunden, der suprapubische Blasenkatheeter nach 2 Wochen entfernt.

Fallbericht

3 Wochen alter männlicher Säugling, erstmalige stationäre Aufnahme am 29. 9. 1971 wegen Nahrungsverweigerung und Erbrechen. Blasenhochstand, beide Nieren tastbar, tröpfelnder Harnabgang. Serum-Harnstoff 206 mg/l, Serum-Bikarbonat 7,9 mEq/l. Das suprapubisch durchgeführte Cystogramm

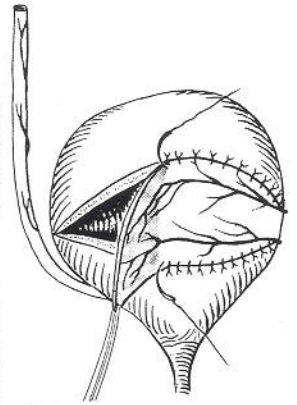


Abb. 3

Figure 1. Eckstein's ureterocystoplasty diagrams, in *Aktuelle Urologie* (Stuttgart), 1973, 4(4):255-257 (Fig. 2-4).

HISTORY SHEET

Consultant:	House Officer:
Provisional Diagnosis: (on admission)	
Operation	Mr. Eckstein Anaesthetic Dr. McLean
LEFT NEPHROSTOMY, URETERO-CYSTOPLASTY	
<p>Left anterior incision extended across abdomen through previous scar. Peritoneum accidentally opened, and later closed. The bladder was dissected off the anterior abdominal wall and fistula divided. The bladder was of remarkably good appearance and capacity and the mucosa not inflamed. Left ureter then identified and then dissected out carefully. Left kidney mobilised. It was very stuck to the nephrostomy area. Renal pedicle divided and ligated. Kidney and proximal 3 cms of ureter removed. Ureter then carefully dissected down to bladder. An incision was then made along the whole length of the left ureter extending through uretero-vesical junction and joining up with the previous opening in the bladder. It was noted that at this stage the strip of ureter had a perfectly good blood supply. The ureter was then sutured to the bladder wall with interrupted 4-0 chromic catgut sutures going through all layers of bladder. Proximal 6 cms of ureter were used and a further 2 cms were dissected because of a doubtful blood supply. The appearance at the end of this procedure seems satisfactory and appeared to have given some increase in bladder size. A urethral catheter was inserted and carefully sutured to the foreskin with two silk sutures.</p>	

Figure 2. Ureterocystoplasty notes. 4.5.1972.

Operation: Mr. Eckstein, Anaesthetic: Dr. McLean.

" Left anterior incision extended across abdomen through previous scar. Peritoneum accidentally opened, and later closed. The bladder was dissected off the anterior abdominal wall and fistula divided. The bladder was of remarkably good appearance and capacity and the mucosa not inflamed. Left ureter then identified and dissected out carefully. Left kidney mobilised. It was very stuck to the nephrostomy area. Renal pedicle divided and ligated. Kidney and proximal 3 cms of ureter removed. Ureter then carefully dissected down to bladder. An incision was then made along the whole length of the left ureter extending through uretero-vesical junction and joining up with previous opening in the bladder. It was noted at this stage the strip of ureter had a perfectly good blood supply. The ureter was then sutured to the bladder wall with interrupted 4-0 chromic catgut sutures going through all layers of bladder. Distal 6 cms of ureter was used and a further 2 cms were dissected because of a doubtful blood supply. The appearance at the end of this procedure seems satisfactory and appeared to have given some increase in bladder size. A urethral catheter was inserted and carefully sutured to the foreskin with two silk sutures..."

vis and proximal ureter were removed on the affected side. An incision along the whole length of the ureter was extended through the uretero-vesical junction and into the anterior bladder wall. Finally, the distal ureter was sutured to the bladder as a flap. A portion of this ureteral flap was discarded because of doubtful blood supply. The appearance at the end of the operation was satisfactory and indicated an increase in bladder size (Fig. 2).

In his follow-up the child was noted to thrive well and at 16 months a cystogram revealed a normal bladder contour. The capacity had reached 80 mls. Three years after ureterocystoplasty, obstruction at the right uretero-vesical region necessitated re-do ureteral reimplantation into a Boari flap. Only slight trabeculation was evident in the preoperative cystoscopy and the incorporated ureteral gusset could not be distinguished from the rest of the bladder. Recurrent stricture of the distal right ureter continued to be a problem and when the patient was 6

years old it was decided to create an ileal loop conduit for him. The bladder was defunctionalized for almost a year before the patient underwent renal transplantation for end-stage renal failure.

Pre-transplant urological investigations proved a bladder capacity diminished to some 25 mls. Again, at the time of the operation it was noticed that the ureter of the graft kidney was being reimplanted into a "tiny" bladder. Post-transplant bladder compliance, however, was remarkable and the bladder developed capacity within months. The patient had a "nocturnal enuresis" for a year after his transplant, but has remained continent since. Interestingly, an IVU in 1980 reported "no abnormality" in the transplant kidney and bladder.

The development of the bladder after ureterocystoplasty and kidney transplantation has allowed the patient complete continence. He is dry at night and voids at about three hourly intervals during the day, at present, and has maintained good renal function while leading an active life (20).

Today, one limiting factor deriving from the circulation of the ureteric flap underlined in this report has been overcome by a modified technique of "vascularized ureterocystoplasty" (P.G. Ransley, 1994, unpublished).

Herbert Eckstein's foresight has been borne not only by a personal result, but the testimony of a new generation of pediatric urologists.

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20. Information kindly provided by the patient (MPB) himself (Dec 1994)

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*mit den besten
kollegialen Grüßen
Ihr Werner Fritz*

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