Urinary diversion

A continuing challenge

URINARY diversion is an admission of an inability to preserve or restore satisfactory bladder function. The wide range of indications, which include congenital anomalies, trauma, intractable cystitis, and neoplasms involving the bladder, coupled with the absence of an ideal substitute for the normal bladder, promise to keep urinary diversion a subject of continuing investigation.

According to Herbst and Polkey,[1] Sir John Simon performed the first ureterointestinal diversion for a patient with bladder extrophy in 1851. By 1936, Hinman and Weyrauch[2] had identified more than 60 ureterointestinal diversion techniques, as reported by more than 50 surgeons using one or more of 11 different principles. In the ensuing 50 years, additional techniques have been developed. Additionally, after the description in 1950 by Ferris and Odel[3] of the hyperchloremic acidosis accompanying ureterointestinal anastomosis, a progressively greater understanding of the pathophysiology of such diversions contributed to the continuing evolution of techniques.

In 1935, Seiffert[4] reported construction of an ileal conduit, but the absence of practical collecting devices may have contributed to the apparent lack of interest in the procedure. In 1950, Bricker[5] described a ureteroileal conduit construction technique using the Rutzen bag for urine collection. The rapid and widespread adoption of this procedure justifiably earned Bricker credit for its introduction. Construction of the ileal conduit was associated with the usual risks of major intra-abdominal surgery, but the hazards of electrolyte imbalance and infection accompanying urinary diversion into the intact colon were reduced, and a practical method of diversion was provided for patients subjected to pelvic exenteration.[6,7]

In this issue of the *Cleveland Clinic Journal of Medicine*, Klein and associates[8] discuss abdominal stomal complications after construction of intestinal urinary conduits. Such stomas have been the principal cause of complications and the source of social inconvenience. Flush, everted, or loop stomas have been variously used. The flush stoma is less easily seen by the patient and is subject to inversion with growth or weight gain, and thus is more likely to result in complications; this has made it less popular than everted or loop stomas.[9] Yet a flush stoma carefully created with bowel of adequate length and blood supply seems to serve the purpose well in most circumstances.[10,11] Excluding specific indications, the study of Klein et al indicates that there is little difference between an everted or a loop stoma in terms of early and late complications or of socioeconomic considerations, provided that meticulous preoperative, operative, and postoperative levels of care are maintained.

Special indications for the loop stomas, as the authors point out, include the patient with an absolutely short or relatively short (as in extreme obesity) mesentery. These considerations reiterate an editorial comment by Zinman[11] in 1985 relative to the importance of operative technique and postoperative care of the abdominal urinary stoma.

Over the past 10 years, as quality-of-life issues have become a greater focus of attention in medical practice and as long-term complications of the ileal conduit have become apparent, there has been laudable exploration of a considerable number of diversion techniques that obviate the need for an external appliance, either by creating a continent abdominal stoma that permits intermittent catheterization or by anastomosing an intestinal urinary reservoir to the urethra above an intact urinary sphincter.[12–14] Nevertheless, such procedures have been applicable only in selected patients, and results of long-term follow-up are generally not yet available. It is

doubtful that the incontinent abdominal stoma of an intestinal urinary conduit will disappear completely from the surgical armamentarium within the foreseeable future.

No surgical procedure seems to have received more attention by such a diversity of surgeons or to have stimulated more surgical ingenuity than urinary diversion. Careful case selection and preoperative counseling, meticulous operative technique and postoperative care, and appraisal of end results after long-term follow-up, as epitomized in the study by Klein and associates, have proved essential in the past and will likely remain so.

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REFERENCES

1. Herbst RH, Polkey HJ. Surgery of the ureter. [In] Ballenger EG, Frontz WA, Hamer HG, Lewis B, eds. History of Urology. New York, AMS Pr, 2nd vol, 1983, pp 321–343.
2. Hinman F, Weyrauch HM Jr. A critical study of the different principles of surgery which have been used in uretero-intestinal implantation. Tr Am A Genito-Urin Surgeons 1936; **29:**157–169.
3. Ferris DO, Odel HM. Electrolyte pattern of the blood after bilateral ureterosigmoidostomy. JAMA 1950; **142:**634–641.
4. Seiffert L. Die "Darm-siphonblase." Arch f klin Chir 1935; **183:**569–574.
5. Bricker EM. Bladder substitution after pelvic evisceration. Surg Clin N Am 1950; **30:**1511–1521.
6. Bricker EM. Current status of urinary diversion. Cancer 1980; **45:**2986–2991.
7. Sullivan JW, Grabstald H, Whitmore WF Jr. Complications of ureteroileal conduit with radical cystectomy: review of 336 cases. J Urol 1980; **124:**797–801.
8. Klein EA, Montie JE, Montague DK, Novick AC, Straffon RA. Stomal complications of intestinal conduit urinary diversion. Cleve Clin J Med 1989; **56:**48–52.
9. Jeter KF. The flush versus the protruding urinary stoma. J Urol 1976; **116:**424–427.
10. Schmidt JD, Hawtrey CE, Flocks RH, Culp DA. Complications, results and problems of ileal conduit diversions. J Urol 1973; **109:**210–216.
11. Zinman LM. A comparison of end versus loop stomas for ileal conduit urinary diversion (editorial comment). J Urol 1985; **133:**590.
12. Monte JE, Pontes JE, Smyth EM. Selection of the type of urinary diversion in conjunction with radical cystectomy. J Urol 1987; **137:**1154–1155.
13. McDougal WS. The continent urinary diversion (editorial). J Urol 1987; **137:**1214–1215.
14. Boyd SD, Feinberg SM, Skinner DG, Lieskovsky G, Baron B, Richardson J. Quality of life survey of urinary diversion patients: comparison of ileal conduits versus continent Kock ileal reservoirs. J Urol 1987; **138:**1386–1389.