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Extrophy of the bladder: experience with Hendren's staged rectal diversion of urine

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Summary

Eight children, all with bladder extrophy, have undergone staged urinary diversion to the rectum, as described by Hendren. All but one had required conversion of ileal to colonic conduit drainage as a first step. One patient developed progressive renal damage and had a colonic loop re-established. The remainder are all well with a follow-up of 0-8 years, having good urinary control and normal biochemistry. One patient planned for this staged procedure developed complications at his ureteric anastomosis to the conduit and was finanly managed by uretero-sigmoid anastomosis. Our method of pre-operative assessment is described.

Key words: Bladder extrophy

Introduction

In 1976 Hendren described a plan or managing cases of bladder extrophy for whom primary closure of the bladder was not feasible. This comprised establishing a non-refluxing colonic conduit or converting a pre-existing ileal conduit to a colonic conduit and subsequently anastomosing the conduit to the rectum. During the past 10 years we have employed this technique with generally good results.

Clinical Details

Preoperative Assessment

Patients are not considered for this surgery until they themselves and their family request that it should be considered. In children under the age of 10 the outline plan is introduced to the family as early as possible. Above this age the protocol was outlined with a view to proceeding after full assessment.

Complete continence of stool was demanded of all patients prior to investigation. All patients were shown to have a normal Hb, serum electrolytes, blood urea and serum creatinine. They were then admitted for a 2-day period to assess the feasibility of rectal continence of fluid. This was achieved by instilling progressively increasing volumes of normal saline per rectum starting at 50 ml and rising to 200 ml. They were then required to remain continent for a period of at least 4 hours. All patients also underwent examination by water soluble contrast enema to exclude unforseen anatomical problems and where a colonic conduit was to be fashioned, to ensure that there was a sufficient sigmoid loop for the procedure to be undertaken.

Patients

Five girls and 3 boys have undergone complete rectal diversion of the urine, only one having a primary colonic conduit, the remainder having an ileal conduit changed to a non-refluxing colonic conduit as a first step. Uretero-colic anastomosis was achieved in all but one using a Leadbetter reimplantation technique. The other case initially had a nipple anastomosis as described by Mathiesen, but this failed to prevent reflux and the anastomosis was converted to a Leadbetter type. In one child the newly fashioned colonic conduit was anastomosed to a retained portion of the ileal conduit, to avoid interfering with an excellent stoma. Six months was allowed to elapse before the conduit was taken down and anastomosed to the upper rectum. Prior to this stage the uretero conduit anastomosis was shown to be non-refluxing in each case and upper tract dilatation was excluded in all instances.

One further boy embarked upon this course having an ileal loop converted to a colonic loop. Unfortunately, the Leadbetter anastomosis failed to prevent reflux and upper tract dilatation deve-

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loped. He underwent right-to-left uretero-ureterostomy and re-anastomosis of the left ureter to the conduit. In spite of this, upper tract dilatation persisted in association with a recurrent urinary infection. He subsequently underwent uretero colic anastomosis and now the right kidney is undilated and the left shows mild hydronephrosis.

Results

Out of 8 patients, one boy operated on at the age of 15 years, developed progressive hydronephrosis and hydro-ureters following anastomosis of his conduit to the rectum. This was complicated by recurrent urinary infection and the loop was exteriorised again as a colonic conduit. Subsequently his upper tract dilatation has improved and his infections had cleared. He has chosen to remain with a stoma. One boy has only been operated on in the last month. The remainder have follow-up between one and 5 years. The youngest to undergo rectal diversion was aged 8 the time of surgery. For 2 years he remained incontinent of urine and faeces, but eventually achieved complete control by day and night. The remainder achieved full continence between 2 weeks and 2 months after surgery and all have undilated upper renal tracts and normal serum biochemistry.

Discussion

This plan for achieving continent urinary drainage in cases of bladder extrophy in whom primary reconstruction was considered not feasible, was chosen for the reasons indicated by Hendren [1]. We consider that a non-refluxing conduit is essential prior to rectal diversion of urine to prevent ascending infection. The critical anastomosis in this porgramme is the uretero-colic anastomosis. If this is created in a colon conduit the stability of the anastomosis without stricture formation can be assured before the urine is diverted to mix with the faecal stream. Also, as pointed out by Hendren, we have seen some patients with uretero-colic anastomoses established in the first 2 years of life who have remained incontinent of urine and faeces during early childhood with socially disruptive results. It is our policy not to contemplate attempting rectal diversion unless the patient can be demonstrated to be fully continent under the conditions described above, with rectal instilation of saline. The patients must also be enthusiastic for the procedure to be undertaken, yet at the same time old enouh to understand what will be required of them. Only one patient persuaded us to operate before the age of 10 and he continued with a variable degree of soiling for 2 year. He is now fully continent but regretted choosing an earlier age for operation. If a uretero-rectal anastomosis performed early in life proves to be unsatisfactory and the patient then undergoes the creation of an urinary stoma at the age of 10 or so, this can be emotionally catastrophic. Conversely, the offer of removing a stoma as teenage years approach is acceptable to most, but not all, patients. Should the programme be unsuccessful, then reversion to a stoma leaves them at no greater disadvantage than previously. On the other hand, should the stage of creating a colon conduit be unsuccessful, then there is still the possibility of establishing a direct uretero-sigmoid anastomosis, as demonstrated in one of our cases.

To date we have not seen any biochemical abnormalities in these patient, although most have a serum bicarbonate level at the lower limit of normal. One girl has even gone on to get married. The major long-term risk of these anastomoses is the development of malignant disease, which it is suggested may occur in 10 % of cases [2]. However, all families are counselled about the need for regular urological and colonoscopic review on a life-long basis. We consider that there should be no difficulty inspecting the stump of a colon conduit anastomosed to the rectum with the modern flexible instruments and there is just a possibilitiy that staging the anastomosis in this manner may reduce the malignant potential. Looking to the future, more elaborate methods of primary reconstruction of the lower urinary tract for bladder extrophy may obviate the need for this complicated surgery.

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References

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