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Ileal Loop Replacement and Restoration of Kidney Function in Extensive Bilharziasis of the Ureter

R. E. ABDEL-HALIM

Department of Urology, Benghazi University, Benghazi, Libya

Summary—Ileal loop replacement is often the only possible treatment for extensive bilharziasis of the ureter. Experience with 5 such cases is presented and the special problems arising from the nature and extent of the lesion are discussed.

In bilateral cases, attempts should be made to preserve as much renal tissue as possible. Non-functioning kidneys in 3 cases were not removed and a degree of function was restored following the relief of obstruction by also connecting these kidneys to the ileal loop.

Bilharziasis of the ureter is a difficult condition to treat. This disease frequently causes extensive bilateral ureteric obstruction with resulting renal damage. The obstruction may be due not only to the strictures themselves, but also to the adhesions and periureteritis which produce tortuosity and kinking. Calcification of the ureteric wall or extensive replacement of its muscle layer by the bilharzial lesions may lead to obstruction even in the absence of stones or strictures. Treatment by measures such as ureteric dilatation (open or closed) or resection and end-to-end anastomosis do not usually give good results. On the other hand, operations such as reflux-preventing ureteroneocystostomy or Boari flap procedures are not suitable because of the associated bladder disease. This paper aims at emphasising the role of ileal loop replacement in the treatment of extensive ureteric bilharzial disease.

Patients and Methods

Case 1. A.I.H., a 22-year-old man, presented with bilateral ureteric fistulae and very poor general condition. He gave a history of bilateral ureterolysis, ureterolithotomy and open dilatation of the bilharzial strictures. Excretion urography showed bilateral gross hydronephrosis and hydroureter down to the sites of the fistulae. Cystoscopy confirmed bilharziasis. Two months later his left fistula dried up. Loss of left renal function was suspected and confirmed radiologically. After extensive supportive treatment, an ileal loop ureteric replacement was performed as in Figure 1.

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Case 2. R.A., a very ill 22-year-old man, presented with a tense mass in the abdomen 2 weeks after a left ureterolithotomy with open dilatation of a lower ureteric bilharzial stricture. A fluid mass was drained. Subsequently an excretion urogram showed gross hydronephrosis and hydroureter down to a stricture which was higher than that initially encountered. An ileal loop replacement was carried out.

Case 3. B.A., a 50-year-old man, presented with recurrent attacks of left renal colic and increasing dysuria. An excretion urogram showed calcification of the bladder and lower third of the ureters, with non-function of the right kidney and left-sided hydronephrosis with hydroureter down to the strictured and

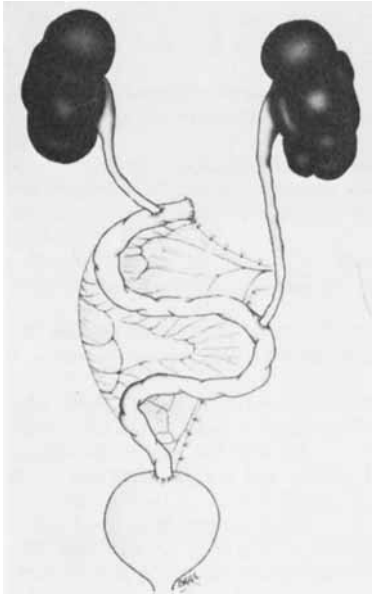

Fig. 1

calcified lower ureter. Cystoscopy showed a bilharzial bladder, and a transurethral resection was done to relieve dysuria. Later an ileal loop replacement was carried out, as in Figure 2, together with removal of a left lower pole stone.

Case 4. J.A., a 27-year-old man, presented with an attack of left renal colic. He gave a past history of urinary bilharziasis. Excretion urography showed a calcified bladder, non-functioning right kidney and gross left-sided hydronephrosis and hydroureter. The lower third of the ureter did not fill. An ileal loop replacement of the strictured parts of his ureter was performed as in Figure 3.

Case 5. H.S., a 35-year-old man, presented with a left post-operative urinary fistula. The nature of the operation carried out 2 months previously was not known, although he had a past history of bilharziasis. An excretion urogram showed right hydronephrosis and hydroureter. The lower third of the ureter was not seen. A similar picture was seen on the left side, only the upper 2.5 cm of the ureter filling with contrast media. Ileal loop replacement of the strictured ureters was carried out (Fig. 4).

Points of Technique

A neomycin bowel preparation was used in all cases.

A long midline incision from xiphisternum to symphysis pubis gave adequate exposure, allowing high procedures such as nephrolithotomy or pelvi-ileal anastomosis to be performed with ease. The contents of the isolated loop were squeezed out and an isoperistaltic anastomosis was performed in unilateral cases. In bilateral disease a twisting loop, as in Figures 1, 2, 3 and 4, was used without compromising the blood supply to the loop in any case.

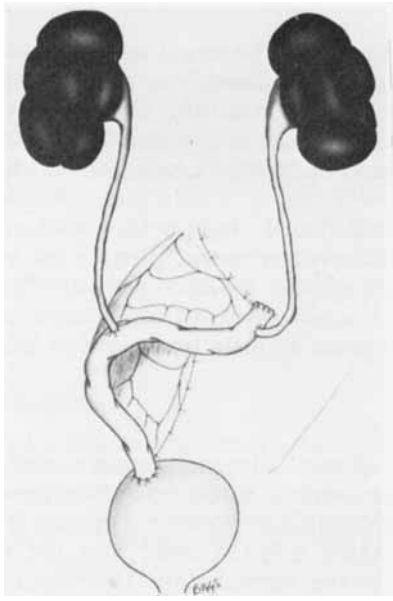

Fig. 3

In patient 5 the end of the ileum was anastomosed to the front of the left pelvis (Fig. 4). In the remaining patients the proximal end of the loop was closed and a direct uretero-ileal anastomosis, as in Figures 1, 2 and 3, was performed.

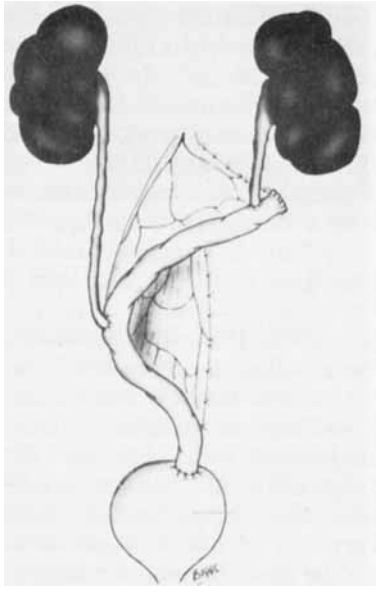

Fig. 2.

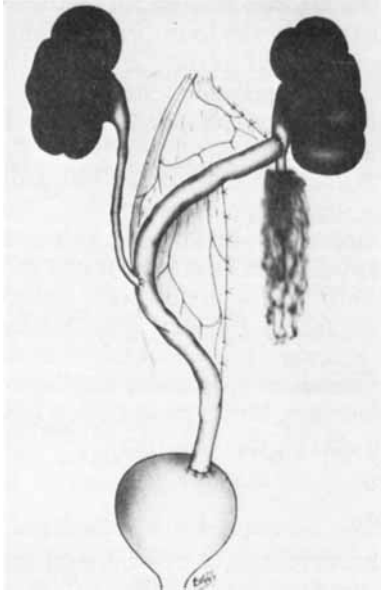

Fig. 4 a—Area of dense fibrosis due to peri-ureteritis and extravasation.

The bladder was opened on the right posterolateral surface sufficiently to examine the bladder and deal with any coexisting bladder neck obstruction. Anastomosis of the distal end of the loop was carried out to this opening from outside the bladder.

Except in Case 1, fine Portex tubing splints were used for the anastomosis bringing the end of the tube through the bladder and abdominal wall. Two such tubes were used for bilateral cases. The diseased lower segment of ureter was left *in situ*.

Results

Case 1, in which no splints were used, was the only case with a stormy post-operative period. He developed gram-negative septicaemia and ileus after leaking infected urine into the peritoneal cavity on the second day. He responded well, however, to conservative therapy.

The remaining patients had an uneventful post-operative period. Splints were removed after 7 to 10 days, the urethral catheter being kept a few days longer.

During the first 2 weeks a considerable amount of mucus was passed in the urine and the patients had frequency of micturition both by day and night. This gradually ceased.

Case 4 returned to hospital 2 weeks after discharge with acidosis following a heavy protein intake. His bladder was empty and there was no apparent stasis in the loop. Parenteral fluids corrected his acidosis. In this series of 5 cases there was no post-operative mechanical intestinal obstruction and no persistent fistula. There was no mortality.

Case 1 lost function to the left kidney while awaiting ileal loop replacement. Two other patients had a non-functioning kidney on admission. All of these kidneys were found to be grossly hydronephrotic. The ureters were divided high up and connected to the ileal loop instead of performing a nephrectomy. An excretion urogram 1 to 2 months post-operatively confirmed restoration of function, although in Case 4 this was only demonstrable on the 12-h film.

Discussion

Although the technique of ileal loop replacement of the ureter has been described before (Goodwin, 1960; Macalister, 1960; Amin, 1976), it has not yet gained widespread recognition. Badr (1977), in a chapter on the surgical management of urinary bilharziasis, did not mention ileal loop replacement as a possible line of treatment.

Honey and Gelfand (1960) employed a length of isolated ileum to replace the diseased lower ureter when they found a bladder flap impossible. Weinberg (1970) had disastrous results following flap procedures for bilharziasis and reported 4 other cases managed by loop replacement. Ghoneim *et al.* (1971) used similar techniques in 4 out of 19 survivors in a series of 21 patients admitted with anaemia due to bilharzial strictures of the ureter. Amin (1976) reported 18 cases of ileal loop replacement. Half of these patients had bilateral fibrosis of the lower ureter.

Although it has been recommended that the isolated loop should be irrigated during surgery by saline (Macalister, 1960) or a warm solution of neomycin (Goodwin, 1960), this was found to be unnecessary. It seems clear from a report by Davis and Nealon (1957), and from Goodwin's experience (1974), that replacement of the ureter by small intestine should always be performed in an isoperistaltic direction. In right-sided and bilateral cases a twisting type of rotation of the isolated loop is necessary to achieve this. Weinberg (1970) noticed that the loop became cyanotic when placed isoperistaltically on the right side, but became viable in the antiperistaltic position. This observation led Amin (1976) to lay the isolated loop in a U-shaped arrangement, giving an isoperistaltic anastomosis on the left side and an antiperistaltic one on the right. He reported subsequent reflux on the right side, but it was noticeably absent on the left. In the present series an isoperistaltic anastomosis in unilateral, and a twisting loop in bilateral cases, presented no problems of blood supply or reflux.

The proximal ureteroileal anastomosis in our cases was of a direct type, as oblique tunnel anastomosis may lead to stenosis (Amin, 1976), and reflux is unlikely with this technique (Goodwin, 1960).

Goodwin (1960, 1974) found it most convenient to perform the distal anastomosis from inside the bladder. A circular window was excised from the posterior wall for an anastomosis; however, it is neither easy nor is it felt advisable to remove a disc of bilharzial wall if an adequate ileovesical anastomosis can be performed otherwise. No stenosis resulted in our 5 cases of direct anastomosis to the posterolateral opening.

It was found unnecessary to carry out proximal

urinary diversion above the ureteroileal anastomosis, as advocated by Goodwin (1974).

Weinberg (1970) excised the diseased lower ureter but Amin (1976), although excising some segments, ignored others. In the presence of previous surgery or extravasation of urine, resection of the involved ureter can prove very hazardous, so simple ligation of the distal fibrosed ureter is recommended and in our cases presented no subsequent problem.

To guard against stasis in the loop it is important that any distal urinary obstruction should be dealt with before ileal loop replacement.

Cordonnier and Bowles (1970) explained the delayed dilatation of the ileal loop reported by Houtappel and Grundemann (1960) as due to distal urinary obstruction. However, Gibbon (1978; personal communication) noted the onset of dilatation of the loop, without evidence of distal obstruction, 15 years after ileocystoplasty for enuresis.

Tanagho (1975) dealt with 5 patients who had delayed decompensation of the bowel segment and is against incorporating intestinal loops into the closed urinary system.

McCullough *et al.* (1977), who used the ileum as a ureteric replacement in 12 patients, 7 of whom had solitary kidneys, found in a follow-up of 1 to 13 years that renal function was well preserved and electrolyte balance was minimal. Abrams and Buchbinder (1977) had a similar experience in 4 patients followed up for 4, 5, 11 and 12 years.

Fritzsche *et al.* (1975), in a radiographic review of 100 patients who had undergone ileal ureter operations between 1954 and 1975, found that vesicoileal reflux occurred consistently but without apparent harm. There was no decrease in parenchymal thickness or scarring, and dilatation of the pelvicaliceal systems was decreased or stable in the majority of cases.

Horiuchi and Hoshino (1975), in a study of 33 patients with loop reconstruction, found a tendency for hyperchloraemic acidosis and high blood urea to occur only in those patients with poor renal function. The degree and incidence of these changes was influenced by the length of ileal segment and the volume of urine excreted. Goodwin (1960, 1974) has repeatedly pointed out that the ileum should not be incorporated into the closed urinary system in patients with a pre-operative serum creatinine exceeding 0.2 to 0.25 mmol/l. An ileocutaneous diversion would be preferable.

Unfortunately, the patient with bilharzial disease is usually completely against any form of external diversion. An ileal ureter is thus the only alternative for such patients even in the presence of poor renal function. The loop should be as short as possible, and a high calorie, low protein diet with courses of sodium bicarbonate and urinary antiseptics post-operatively are advisable.

Regular follow-up to ensure proper emptying of the bladder and loop are essential.

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The Author

R. E. Abdel-Halim, MB, BCh, DGS, FRCSE, Professor of Urology, Department of Urology, King Abdul-Aziz University Hospital, P.O. Box 6615, Jeddah, Saudi Arabia.