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LAPAROSCOPY/ROBOTICS
ORIGINAL ARTICLE

Laparoscopic management of distal ureteric stones in a bilharzial ureter: Results of a single-centre prospective study

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KEYWORDS

Laparoscopy;
Transperitoneal;
Bilharzial ureter;
Stone

ABBREVIATION

LU, laparoscopic ureterolithotomy

Abstract ***Objective:*** To determine the efficacy and safety of the laparoscopic management of an impacted distal ureteric stone in a bilharzial ureter, as bilharzial ureters are complicated by distal stricture caused by the precipitation of bilharzial ova in the distal ureter. These cases are associated with poorly functioning and grossly hydronephrotic kidneys that hinder the endoscopic manipulation of the coexistent distal high burden of, and long-standing, impacted stones.

Patients and methods: We used laparoscopic ureterolithotomy, with four trocars, to manage 51 bilharzial patients (33 men and 18 women; mean age 40.13 years) with distal ureteric stones. The ureter was opened directly over the stone and the stone was extracted. A JJ stent was inserted into the ureter, which was then closed with a 4–0 polyglactin running suture.

Results: The mean stone size was 2.73 cm. Conversion to open surgery was required in only one patient. The mean operative duration was 92 min, the postoperative pain score was 20–60, the mean (range) number of analgesic requests after surgery was 1.72 (1–3), comprising once in 21 patients, twice in 23 and thrice in

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seven. The mean hospital stay was 2.74 days, and the total duration of follow-up was 7–12 months. The stone recurred in four patients and a ureteric stricture was reported in two. All patients were rendered stone-free.

Conclusion: Laparoscopy is a safe and effective minimally invasive procedure for distal ureteric stones in a bilharzial ureter with hydronephrosis.

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Introduction

Schistosomes (bilharzia) are parasites that have been documented to cause urinary disease in humans since ancient times, as recorded in Egyptian papyri, notably those of Eber and Edwin Smith [1]. Schistosomiasis is the second most important parasitic infection after malaria and affects >200 million people in 74 countries [2]. It is endemic, with high prevalence and morbidity rates, in many countries, especially those in Africa, such as Egypt and Kenya, and in South America, mainly Brazil, with a prevalence of 15–45% in Egypt and Brazil [3–5].

Commonly, ureteric lesions are limited to the lower half, at the level of the third lumbar vertebra, which is due to anastomotic channels between the inferior mesenteric and the peri-ureteric and peri-vesical veins. These communications are thought to be the main route through which *Schistosoma haematobium* worms migrate to the urinary system. The lower ureteric lesions in schistosomiasis include early tubercles and ulcers, and subsequently the sandy patches and cysts, known as 'ureteritis cystica'. Fibrosis of the lower ureteric musculosa can lead to partial obstruction; the upper ureter compensates by dilatational hypertrophy that generates enough bolus pressure to overcome the distal obstruction, thereby protecting the kidneys from back pressure [6].

Laparoscopic ureterolithotomy (LU) is a safe well-established treatment option for managing ureteric stones, replacing conventional surgery [7,8]. LU causes less pain, and has a minimal analgesic requirement, a short hospital stay, a shorter recovery phase and better cosmesis [9,10]. LU is done using one of two basic approaches, transperitoneal or retroperitoneal, and each has its advantages and disadvantages [11–13].

Bilharzial ureters are complicated mainly by the distal stricture caused by the precipitation of bilharzial ova at the vesico-ureteric junction and distal ureter. This is associated with poorly functioning and grossly hydronephrotic kidneys that hinder the endoscopic manipulation of the coexistent distal, high-burden, long-standing impacted stones making it technically unfeasible [14].

In the present study we aimed to determine the efficacy and safety of the laparoscopic management of an impacted distal ureteric stone in bilharzial patients.

Patients and methods

This prospective study follows the tenets of the declaration of Helsinki. We used transperitoneal LU in 51 bilharzial patients (33 men and 18 women) who had large radio-opaque distal ureteric stones, during the period from June 2010 to June 2013. All patients were assessed by IVU and this showed gross hydronephrosis in 45 renal units. The inclusion criteria were: large lower ureteric stones (⩾1 cm) visible on a plain film and not amenable to ureteroscopic extraction, hydronephrosis associated with a history of antibilharzial treatment for confirmed bilharzial ova on urine analysis, a radiological appearance of the spindle-shaped lower ureteric stricture characteristic of bilharzial infection, or the presence of ureteritis cystica on ureteroscopy.

Surgical technique

The procedure usually starts with cystoscopy and insertion of an open-tip 6 F ureteric catheter, and then the stone side is laterally tilted to 45°. The LU was performed through four ports, comprising two 10-mm and two 5-mm trocars. After reflecting the colon, the ureter was identified and the stone located and extracted through vertical ureterotomy. The stone was identified by an obvious bulge, or pinching by Maryland forceps. Upward migration of the stone was prevented by applying a laparoscopic Babcock forceps on the ureter above the stone bulge, which was replaced by a vessel tape in some cases, according to the surgeon's preference. This was followed by ureterotomy and stone extraction (Fig. 1). A 6 F JJ stent was then inserted and the ureterotomy closed with 4/0 polyglactin sutures. Using a 5-mm endoscope, the stone was extracted in a sac through the 10-mm port and then a small drain was inserted via the other 5-mm port.

The data collected included patient age, sex, stone details (size, number and laterality) and any history of stone surgery or ESWL. Operative data included the type of anaesthesia applied, operative duration, mean intraoperative blood loss, and the frequency of conversion to open surgery. Postoperative data included pain severity, judged using 100-point visual analogue scale with 0 = no pain and 100 = the worst intolerable pain, the duration until the first request and the number of

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