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ORIGINAL ARTICLE

Definitive ureteroscopy and intracorporeal lithotripsy in treatment of ureteral calculi during pregnancy

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KEYWORDS

Ureteroscopy;
Stenting;
Ureteric calculi;
Pregnancy;
Lithotripsy

ABBREVIATIONS

US, ultrasonography

Abstract ***Objective:*** To evaluate the outcome of using semi-rigid ureteroscopy with or without intracorporeal pneumatic lithotripsy vs. temporary ureteric JJ stenting in the management of obstructing ureteric calculi in pregnant women.

Patients and methods: This prospective comparative study comprised 43 pregnant women with obstructing ureteric calculi. The diagnosis was based on the acute flank pain as the main symptom, microscopic haematuria, and unilateral hydronephrosis on abdominal ultrasonography (US). The patients were randomly divided into two groups; those in group 1 (22 patients) were treated by temporary ureteric JJ stenting until after delivery, and those in group 2 (21) were treated definitively by ureteroscopic stone extraction with intracorporeal pneumatic lithotripsy. Postoperative complications and the degree of patient satisfaction were reported.

Results: An obstructing ureteric stone was identified by US in 68% and 76% of groups 1 and 2, respectively. In group 1, nine patients had mid-ureteric stones and 13 had stones in the lower ureter. In group 2, seven patients had mid-ureteric stones,

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whilst the stones were in the distal ureter in 14. No perioperative foetal complications were detected in any group and all patients completed the full term of pregnancy. In group 1, four patients had a postoperative urinary tract infection (UTI), and the JJ stent was exchanged in seven. Two patients in group 2 had a postoperative UTI.

Conclusions: Definitive ureteroscopy, even with intracorporeal pneumatic lithotripsy, is an effective and safe treatment for pregnant women with obstructing ureteric calculi. It has a better outcome and is more satisfactory for the patients than a temporary JJ stent.

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Introduction

The incidence of urinary stones during pregnancy is reported to be 1/1500 and this is similar to that in non-pregnant women [1,2]. Pregnancy-related stones are most commonly composed of calcium phosphate [3]. Diagnosing calcular obstruction of the urinary tract in a pregnant woman is not easy, as most traditional radiological tools are avoided because of the hazards of radiation exposure, especially in the first trimester [4]. Ultrasonography (US) with an experienced operator is considered to be the diagnostic tool of choice for calcular ureteric obstruction during pregnancy, because it is safe, and has reasonable sensitivity and specificity for detecting hydronephrosis and ureteric stones [5]. If there is infection or persistent pain, pregnant women with ureteric stones can be managed by placing a ureteric JJ stent or percutaneous nephrostomy tube to relieve the obstruction until the end of pregnancy [6]. However, the risk of a UTI, or ureteric stent or nephrostomy tube blockage, rather than loin and/or bladder discomfort, is not uncommon, especially if the procedure was performed at an early stage of pregnancy [7]. Because reports on ureteroscopy and stone retrieval during pregnancy remain infrequent, more studies are required to assess the safety and effectiveness of such a procedure [8,9]. Thus we evaluated the outcome of using semi-rigid ureteroscopy with or without intracorporeal pneumatic lithotripsy, vs. temporary ureteric JJ stenting in the management of obstructing ureteric calculi in pregnant women.

Patients and methods

This prospective comparative study included pregnant women with unilateral calcular ureteric obstruction during the period from October 2006 to December 2013. Patients with no stones and those having bilateral ureteric obstruction or a single kidney were excluded. After failure of medical expulsive therapy, 43 patients were randomly divided according to the planned procedure into two groups. Group 1 included 22 patients who were assigned to be treated by temporary ureteric JJ stenting until the end of their pregnancy, whilst in group 2, 21 patients were assigned to be treated definitively by ureteroscopic stone extraction.

The study was conducted in accordance with the code of ethics of the World Medical Association (Declaration of Helsinki), and an informed consent was obtained from all patients.

Preoperative data for patient age, period of pregnancy, previous stone passage or urological interventions, and presenting symptoms and signs were reported. All patients had a detailed physical examination supported by transabdominal US and urine analysis to identify the presence of hydroureteronephrosis, ureteric stone, microscopic haematuria and UTI, as well as the foetal condition. An intravenous injection with an antibiotic (1 g ceftriaxone) was given to all patients 1 h before surgery and then daily for 5 days after endoscopy. Under strict maternal and foetal care, spinal anaesthesia was administered in 18 patients in group 1 and 19 in group 2, whilst topical lidocaine anaesthesia with sedo-analgesia was used in four and two patients of groups 1 and 2, respectively. Anaesthetic drugs that are a risk during pregnancy, e.g., halothane and nitrous oxide, were avoided. US (not fluoroscopy) was used for obstetric and renal monitoring throughout all procedures. Endoscopy was carried out using a semi-rigid 9.5 F ureteroscope for all patients. Ureteric stones were diagnosed on US in 31 of the 43 patients, 15 of whom were treated with a JJ catheter using a cystoscope only, and the other 16 had definitive ureteroscopy. During the study 12 of the 43 patients with unilateral hydronephrosis only and no stones on US were included in the study, when the ureteroscope was needed to negotiate the guidewire up to the kidney. A JJ stent was placed in seven of these patients until delivery, whilst the other five had definitive ureteroscopy. In group 2, dilatation of the ureteric orifice was required in only four patients. The stone was extracted by ureteroscopy without fragmentation in seven patients, whilst the stones were removed after fragmentation using a Swiss pneumatic lithoclast in the other 14. In each patient in this group

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