



ORIGINAL ARTICLE

# Minimal invasive pyeloplasty technique with vertical surgical approach: An alternative to laparoscopic pyeloplasty

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Received 8 February 2011; accepted 24 March 2011

Available online 14 January 2012

## KEYWORDS

Lumbotomi;  
Open surgery;  
Pain;  
Pyeloplasty

**Abstract** This retrospective clinical study presents pyeloplasty results following a muscle-splitting dissection, with mini-flank incision, using instruments held in a vertical position. Between 2004 and 2010, dismembered pyeloplasty (Anderson-Hynes) was performed in 37 cases (32 males and 5 females) with an average age of 26 years (range, 20–56 years). The technique was carried out through a window opened by separating the lateral abdominal muscles. Operation duration, length of incision, postoperative pain, complications, and radiological and clinical results were discussed. The operation duration was between 50 and 90 minutes (average = 65 minutes), the incisional length 5 and 7 cm (average = 5.2 cm), and visual pain scale was  $4.1 \pm 3.1$  and  $3.3 \pm 3.4$  at 4 and 24 hours after the operation, respectively. The duration of hospitalization was between 30 and 120 hours (average = 42 hours). In a retrospective analysis of our study, one case was reoperated on, following recurrence with obstruction, there were 9 cases with prolonged dilation in response to diuretics and 29 cases with complete recovery. Pyeloplasty operations, with a vertical surgical approach through smaller incisions and muscle separation, offered shorter periods of hospitalization, less postoperative pain, acceptable cosmetic results and higher rates of functional recovery.

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## Introduction

The objective of pyeloplasty is to repair ureteropelvic junction obstruction (UPJO) with the best functional

results. There is a success rate of 90% with open pyeloplasty.

Improvements in endourology have revealed alternatives to open surgery, percutaneous antegrade endopyelotomy and retrograde endopyelotomy, with smaller success rates [1]. Laparoscopic pyeloplasty is gradually being considered to be an alternative to open surgery, but longer operation durations and a long surgical training requirement prevents

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it from being performed as a routine procedure at most medical centers. Consequently, open surgery still largely remains the chosen procedure [2].

In this study, we evaluated the results of pyeloplasty operations performed with a vertical surgical approach, through a small incision and muscle separation.

## Material and methods

Between 2004 and 2010, 37 operated cases with dismembered pyeloplasty due to congenital UPJO were retrospectively examined. Blood urea and creatinine levels, urine culture, intravenous excretory urography (IVU), and diuretic renogram, with diethylenetetraamine pentaacetic acid (DTPA), were performed prior to the operation. All cases were operated on with the same surgical method explained below. Operation and hospitalization durations, length of incision, and pain assessment with the visual analogue pain scale, were recorded. Patients were asked to evaluate their pain scale between 0 (no pain) and 10 (maximum pain), 4 and 24 hours after the operation. Intramuscular or oral diclofenac diethylammonium 100 mg (Voltaren, Novartis Pharma, Istanbul, Turkey) was administered for postoperative analgesia. Patients with oral intake and comfortable mobilization, without drainage, were discharged. The upper urinary system was evaluated 2 months after the operation with renal ultrasonography. Outcomes were analyzed 6 months after the operation, with IVU and DTPA renal scintigraphy. The line of incision was examined in terms of incisional hernia.

## Surgical procedure

Patients were operated on under the lateral decubitus position, leaning backwards slightly. Operations were initiated with a 5 cm mini flank incision and performed to the depth with a vertical surgical approach. The retroperitoneal area was accessed below the 12<sup>th</sup> costal margin, following separation of the external oblique, internal oblique and transverse muscles with retractors. No muscles

were incised under any circumstances. The length of incision was extended up to 7 cm in cases where the initial incision was inadequate. A fine drain tube (18–20 F) was placed in the retroperitoneal area in all cases and removed on the 2<sup>nd</sup> postoperative day. Muscles were not sutured. Only muscle aponeurosis was closed with 4/0 polyglactin sutures. Diluted bupivacaine (20–30 ml, 50%) (Marcain Flakon, AstraZeneca Pharma) was injected subcutaneously for postoperative analgesia. The skin was closed subcutaneously with 4/0 self-dissolving sutures.

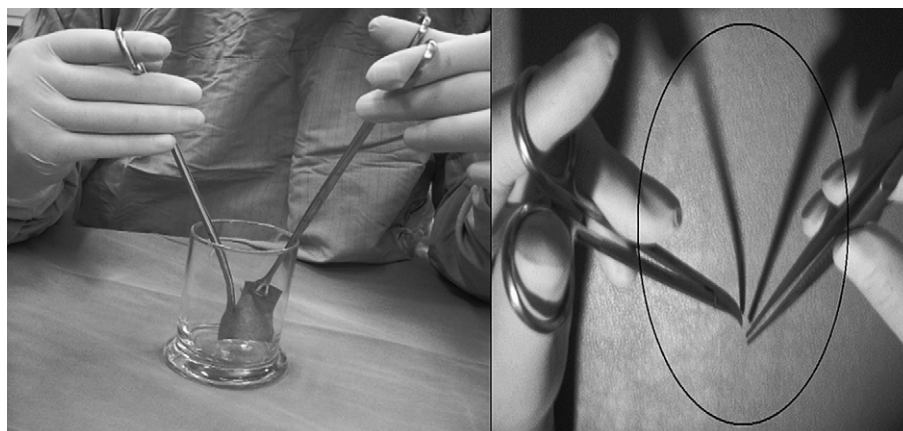
## Vertical method

Handling of surgical instruments by this method is demonstrated in Fig. 1. The handles of the surgical instruments are gripped with the thumb and index fingers of both the dominant and secondary hands. Thus, surgical instruments could be manipulated at an angle close to 90 degrees. Hand trembling is minimized by placing both elbows and hands on the patient. Bending over the operating table to achieve a view is, therefore, not necessary, and this approach allows dissection and suturing in a deep area through a small window.

## Dismembered pyeloplasty method

The ureter was initially located and suspended. The renal pelvis was exposed with obtuse and sharp dissections. The kidney was mainly unreleased. Obstruction of the ureteropelvic junction and presence of aberrant vessels was exposed and a full incision of the ureteropelvic junction was performed. The fibrotic upper end of the ureter was excised, and at least 2 cm spatulation was performed. Reduction was performed in cases with extreme pelvic dilatation. Mucosal edges were inverted and sutured with juxtapositioning of the adventitia with 5/0 or 6/0 polyglactin acid suture for ureteropelvic anastomosis.

Urinary drainage was achieved with 6 French double j ureteral stents in all patients. The ureteral stent catheter



**Figure 1.** Handling of surgical instruments in Vertical method. The angle between the two surgical instruments is wider in the traditional handling. Additionally, a wider surgical area is needed and hand trembling could not be minimized. In the vertical method, the instrument is gripped with the thumb and index fingers to work in the deep area through a small window with minimizing the hand trembling.

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