

# Anterior Transperitoneal Approach to the Upper Urinary Tract with One-stage Bilateral Procedure

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**Summary**—A total of 109 unilateral and 4 bilateral upper urinary tract conditions were treated surgically from 1975 to 1985 by the anterior transverse transperitoneal approach; 26 of these were malignant conditions and 87 were benign. The approach gives good access to the kidney, its pedicle and the upper ureter. There is no increased risk of peritonitis or paralytic ileus due to urinary leak.

One-stage bilateral surgical procedures were performed in 4 cases. There was no added risk to the patients. It allows both kidneys to recover simultaneously and provides the opportunity of examining the other intra-abdominal organs.

Operations on the upper urinary tract are the commonest open surgical procedures in urological practice and are likely to remain so in spite of rapid advances in percutaneous and extracorporeal techniques.

Various approaches and incisions to the kidney and upper ureter have been described. The commonest approach is through the loin and this may be through a subcostal, transcostal or supracostal incision, depending on the position of the kidney, the physique of the patient and the preference of the surgeon. A thoraco-abdominal approach for large renal masses and a lumbotomy for re-operation on the upper tract may be indicated. The anterior transperitoneal approach has been advocated for renal tumours as the vascular pedicle can be secured before the kidney is handled in order to reduce the risk of intravascular dissemination of tumour cells. We present our experience with the anterior transverse transperitoneal approach to all high urinary tract lesions for dealing with unilateral and bilateral conditions.

## Patients and Methods

A retrospective analysis of 113 patients with upper urinary tract lesions requiring surgery between 1975

and 1987 was undertaken. Of these 109 had unilateral and 4 had bilateral conditions. All 113 patients were treated through an anterior transperitoneal approach as described by Poutasse (1961) with some modifications.

For unilateral conditions the patient is placed in the supine position with a sandbag under the ipsilateral loin to bring the kidney to a more anterior position. The transverse incision starts halfway between the xiphisternum and the umbilicus and extends towards the tip of the eleventh or twelfth rib. All structures of the anterior abdominal wall are divided in the line of the incision. The ipsilateral colon is mobilised medially (together with the duodenum on the right side) to expose the perinephric fascia. The vascular pedicle, renal pelvis, ureter and kidney are now readily accessible.

For bilateral conditions the patient is placed in the supine position with sandbags under each loin. The incision arches upwards with its midpoint halfway between the xiphisternum and the umbilicus. Ascending and descending colons are mobilised medially to expose both kidneys lying in their perinephric fascia.

Closure of these incisions is in layers and the renal area is usually drained.

There were 58 males (58.3%) and 55 females (48.7%) with an age range of 2 to 76 years; 36 patients (31.8%) were above the age of 60 years, 55

(48.7%) were between 30 and 60 and 22 (19.5%) were less than 30 years old.

Of the 109 unilateral procedures, 63 patients underwent nephrectomy or nephro-ureterectomy for renal carcinoma (21), calculus disease (17), chronic pyelonephritis (10), hydronephrosis (5), transitional cell carcinoma (5), renal cysts (2), hypertension (1), hypoplasia (1) and pyonephrosis (1); 25 patients had Anderson Hynes pyeloplasties for congenital pelviureteric junction obstruction, 20 patients had pyelolithotomies or pyelonephrolithotomies and 1 had a partial nephrectomy for upper pole calculus with hydronephrosis. When indicated, cystoscopy, retrograde ureterography or optical urethrotomy were performed immediately prior to the renal surgery. In addition, 6 of the 109 patients had elective appendectomies, 1 had an appendicectomy and repair of a para-umbilical hernia, 2 underwent cholecystectomy and 1 had a choledocho-duodenostomy.

Four patients with bilateral upper urinary tract lesions had surgery to both sides through the same anterior incision (Fig. 1). A 56-year-old male with stones in the right pelvis and left ureter had a right pyelolithotomy and a left ureterolithotomy. A 31-year-old male with a stone in the right pelvis and 2 stones in the left ureter had similar surgery. A 46-year-old female with a right gross hydronephrosis due to pelviureteric junction obstruction and a non-functioning left kidney underwent a right Anderson Hynes pyeloplasty and a left nephrectomy. A 72-year-old female had bilateral staghorn calculi (Fig. 2) and both were removed by bilateral pyelonephrolithotomy (Fig. 3).

## Results

### Unilateral operations

Urinary leaks developed in 10 patients following reconstructive procedures; 8 of these required the insertion of a stent and the other 2 responded to conservative treatment. None of these patients developed peritonitis or paralytic ileus and leaked urine drained away via a drainage tube. Wound infections occurred in 7 patients (6.4%) but there was no incidence of burst abdomen or incisional hernia. Nine patients (8.2%) became pyrexial. In 6 cases there was a urinary tract infection and 3 patients developed chest infections. All were treated effectively with the appropriate antibiotics. Secondary haemorrhage, paralytic ileus (not due to urinary leakage) and a faecal fistula (in a patient who had a previous pyonephrosis drained) occurred in 3

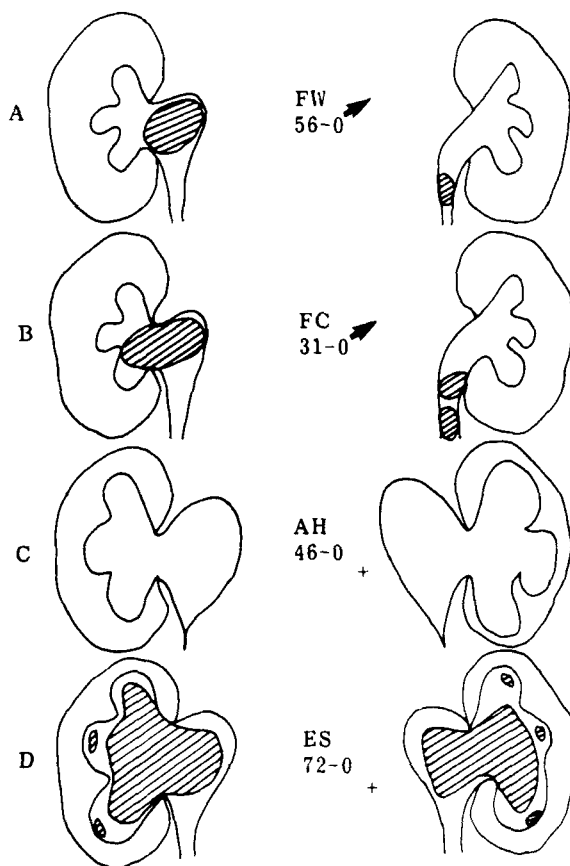


Fig. 1 Diagrammatic representation of bilateral upper urinary tract lesions.

separate patients. All responded satisfactorily to conservative treatment. One 53-year-old female who was uraemic due to calculus disease on admission and underwent emergency nephrolithotomy and ureterolithotomy died on the twentieth post-operative day following cardiac arrest and aspiration of gastric contents.

The average inpatient stay for the 63 nephrectomy patients was 12.68 days (range 3–48); 54% of the patients had been discharged by the tenth post-operative day; 1 patient discharged herself against medical advice on the third post-operative day with drain and sutures but returned to the out-patient clinic having suffered no ill effects.

One male patient stayed for 33 days for social reasons.

For patients following removal of stone the average stay was 11.35 days (range 7–22) and the average stay for patients who had undergone pyeloplasty was 15.2 days (range 7–34) due to urinary leakage.



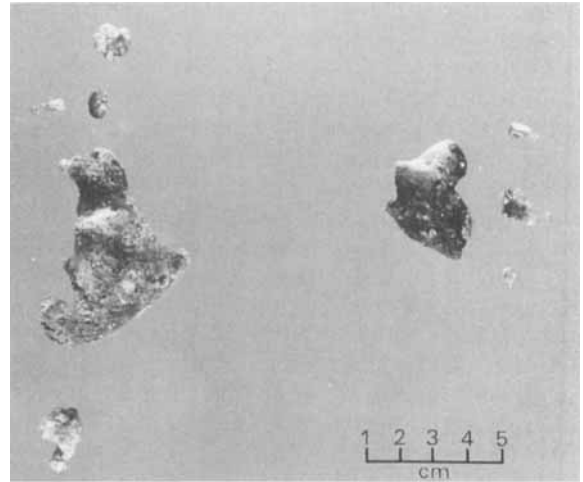
**Fig. 2** Radiograph of case D in Figure 1 with bilateral staghorn calculi.

#### *Bilateral operations*

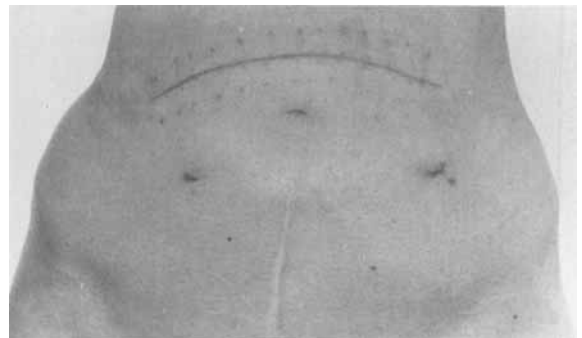
One patient had a urinary leak 14 days after pyeloplasty which required the insertion of a stent and she stayed for 35 days (Fig. 1C). One patient had a post-operative pyrexia following right pyelolithotomy and left ureterolithotomy treated conservatively. He was discharged on the seventh post-operative day (Fig. 1B). One patient had a drain site leakage following bilateral pyelolithotomies; this was treated conservatively and the patient was discharged on the fourteenth post-operative day (Figs 1D and 4).

#### **Discussion**

Poutasse (1961) described the technique of the anterior approach to upper urinary tract surgery which he used in over 250 operations and discussed its advantages and disadvantages. Linke *et al.* (1976, 1978) described a further 13 patients (15 kidneys) and 18 patients (20 kidneys) treated with the anterior approach, in 3 of whom bilateral stones



**Fig. 3** Bilateral staghorn calculi removed at one-stage surgical procedures.



**Fig. 4** Well healed main wound and drain sites 2 weeks post-operatively (Figs 2 and 3).

were removed with a one-stage procedure. Proca (1981) claimed a distinct advantage of the technique when removing stones from horseshoe kidneys in 13 patients (7 unilateral and 6 bilateral stones). Dermiler *et al.* (1983) described 14 patients with bilateral nephrolithiasis who underwent simultaneous bilateral lithotomy safely and discussed the advantages of this approach. Rao and Lakshman (1985) reported 24 selected cases of bilateral urinary tract lesions where single-stage corrective surgical procedures were performed. Many advantages were claimed.

The anterior transperitoneal approach allows good access to both kidneys and vascular pedicles. Positioning of the patient is easy and intra-operative radiography can be carried out more readily. It allows the surgeon the chance to examine other intra-abdominal structures and to carry out other

surgical procedures simultaneously. There is no excess risk of peritonitis or paralytic ileus due to urinary leak.

Blandy and Man meet Singh (1976) advocated an aggressive approach to staghorn calculi with early surgery and complete removal of calculi with early even when asymptomatic. A one-stage procedure eliminates concern about the conditions of the contralateral kidney and avoids the controversy as to which kidney should be operated upon first. A single operation with one anaesthetic and one admission benefits the patient and allows an earlier return to work. There is a reduction in hospital stay and operating time. It is felt that one-stage bilateral surgical procedures on the kidneys have no added risk using modern techniques.

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