ONE - STAGE PERCUTANEOUS NEPHROLITHOTOMY USING AMPLATZ SHEATH

(Received August 23, 1990)

M. Akıncı, M.D. ** / A. Kadıoğlu, M.D.*** M.İ. Karaman, M.D. *** / S. Tellaloğlu, M.D.*

* *Professor, Department of Urology, İstanbul Medical Faculty, Istanbul University, İstanbul ,Turkey.*
** *Associate Professor, Department of Urology, Istanbul Medical Faculty, İstanbul University, Istanbul, Turkey.*
*** *Research Assistant, Department of Urology, Istanbul Medical Faculty, Istanbul University, Istanbul, Turkey.*

SUMMARY

Between April 1987-March 1989,19 one-stage percutaneous nephrolithotomy were performed in our clinic. The stones of our patients were pelvic and solitary, and their sizes varied between 1x1 cm. and 4x2 cm.

The procedure was done under general anaesthesia in 15 patients and high epidural anaesthesia in the remainder four. Our choice as dilatation technique was either Amplatz sheath (n=12) or balloon dilatation (n=7). We disintegrated the stones with ultrasound or electrohydraulic lithotripsy and took them out with forceps. A Malecot nephrostomy tube was left in place until ceasing of hematuria.

We did not face any serious complications and we discharged 13 patients as stone-free achieveing a complete clearence rate of 68.4 %.

Key words: Urinary calculi-percuteneous nephrolithotomy-one stage

INTRODUCTION

In 1955 Goodwin and associates first described percutaneous nephrostomy as a simple technique of establishing access to the collecting system of the kidney (1). Fernström ad Johansson first removed kidney stones after percutaneous nephrostomy (2).

At the beginning two stages were required for percutaneous removal of renal calculi. Thereafter one-stage percutaneous nephrolithotomy was introduced using balloon catheter for rapid dilatation and Amplatz sheath for a wide nephrostomy tract up to 30 F. (3,4).

MATERIALS AND METHODS

Percutaneous stone manipulation was attempted in 19 patients (5 females and 14 males) between April 1987-March 1989 in our department. Ages of the patients ranged from 22 to 53 and the mean age was 38.

Physical examination, urinanalysis, urine culture, SMA-12, IVU and US were our preoperative diagnostic studies. All stones were pelvic and solitary, and their sizes varied between 1x1 cm. 4x2 cm.

Percutaneous nephrolithotomy was done under high epidural anesthesia in four patients while under general anesthesia in the remainder. Antibiotic prophylaxis was done in all patients.

The patient was placed on fluoroscopy table in prone position and a sponge was interposed between the table and hypochondrium of the affected side. All patients underwent ureteral catheterizastion which was used for visualization of the collecting system in cases of non-functioning kidney.

After surgical preparation of the patient a 14 cm. and 18 gauge puncture needle was inserted into the collecting system preferably via the posterior-lower calyx under the twelfth rib on the posterior axillary line. Then, a 0.97mm. and 80 cm. J-tipped guide wire was introduced through the needle into the upper calyx or down the ureter if uretero-pelvic junction was not obstructed by the stone. The dilatation of the tract follows introducing a safety guide wire. The dilatation was done by Amplatz dilators in 12 patients and by a 10 mm. and 4 cm. long reinforced nylon balloon catheter which has a 3 mm. shaft in 7 patients. The balloon itself can withstand internal pressures up to 9 atmospheres. The balloon was left inflated for a 2-3 minutes and subsequently an Amplatz sheath of 30 mm. was inserted over the catheter into the renal pelvis. Then, balloon was deflated and removed, and

a Wickham nephroscope was inserted into the pelvis through the sheath. The small stones were extracted with forceps, but the large ones first were disintegrated by an ultrasonic or electrohydraulic lithotriptor and then taken out. This method was applied successfully in 13 patients while failed in 6 who were transported to the operating room and underwent open surgery. In three of these 6 patients the stones were extracted with a Randall forceps through the nephrostomy tract without requiring pyelotomy.

At the end of the procedure a Malecot nephrostomy tube of 16-18 F was left and removed after the ceasing of hematuria and the performing of control nephrostography.

RESULTS

1. The average hospitalization period was three days in percutaneous group and 7 days in the group of open surgery. We achieved 3.57 days as an overall average hospital stay.

2. Mean time of intrarenal manipulation was 80 minutes.

3. Complications such as bleeding, sepsis, extravasation and damage to abdominal viscera did not occur in our series. No residual stones was left. Causes of failure in 6 of 19 patients with renal stones who underwent percutaneous removal were:

- Difficulty of disintegration in two cases (stone too hard)

- Problem of access to the collecting system in four patients (inadequate access)

4. Our rate of complete stone clearence was 13 of 19 cases after percutaneous nephrolithotomy and 3 of 6 cases in the group of open surgery. The stones of those 3 patients were extracted through the previously established nephrostomy tract. The remainder three required pyelolithotomy.

DISCUSSION

There are limited areas in Turkey where extracorporeal shock wave lithotripsy are available. Therefore percutaneous nephrolithotomy is still in given indications a practical method with little morbidity and great efficiency in renal stone surgery.

Although general indications (5) for percutaneous lithotripsy include large stone volume (greater than 2.5 to 3 cm.) infected stone, cystine stone, obstructive uropathy, massive obesity, children and ESWL failures, because of the above-mentioned reasons in Turkey percutaneous stone removal can be applied to the kidney stones which actually should undergo ESWL treatment.

Our low rate of complete stone clearence (68%) is due to the problems of lithotripsy because of too hard stone (n=2) and inadequate access (n=4). At the beginning percutaneous nephrolithotomy in one stage could have more failure than in two stages, but we suppose that our rate of success will increase with more experience.

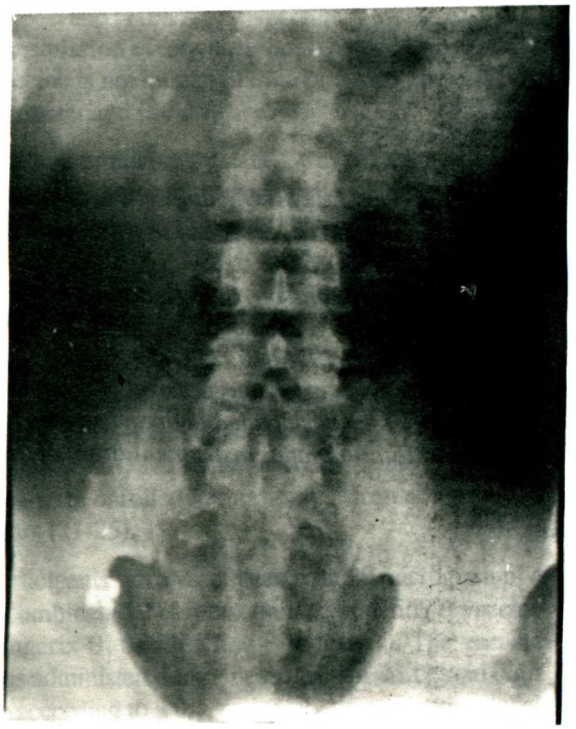

Fig 1: A right pelvic stone (1.2x1.9 cm.) in KUB film.

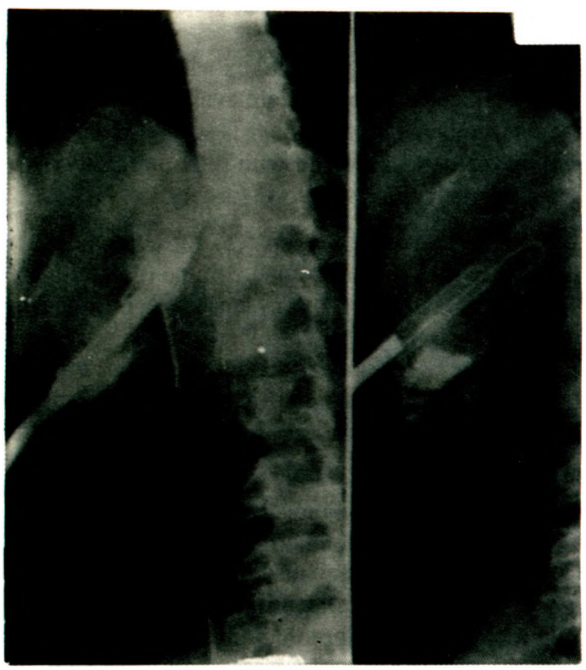

Fig 2: Amplatz sheath and Wickham nephroscope in place preoperatively

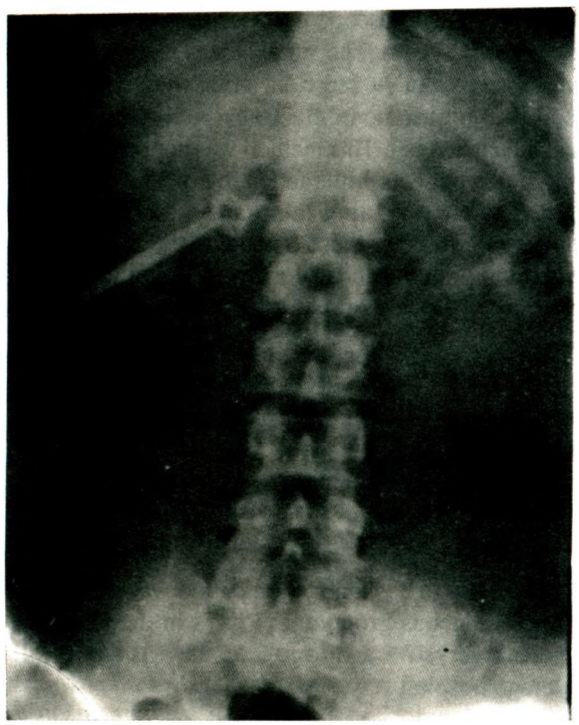

Fig 3: Control film on the second day postoperatively with Malecot tube and no stone.

REFERENCES

1. *Goodwin WE, Casey WC,Woolf, W.Percutaneous trocar (needle) nephrostomy in hydronephrosis. JAMA 1955; 157: 891-894.*
2. *Pernström J, Johansson, B. Percutaneous nephrolithotomy:A new extraction technique. Scand J. Urol Nephrol 1976; 10: 257-259.*
3. *Clayman RV. Percutaneous removal of renal calculi: Use of the backloaded balloon catheter for rapid dilatation and instrumentation of the nephrostomy tract. Brit J Urol (Suppl.) 1983; 19-22.*
4. *Clayman RV. et al. Nephrostolithotomy: Percutaneous removal of renal and ureteric claculi. Brit J Urol (Suppl.) 1983; 6-10*
5. *Segura JW. The role of percutaneous surgery in renal and ureteral stone removal. J Urol Part 2. 1989; 141:780-781.*