
PSEUDORECURRENCE POSTOPERATIVE RENAL STONES; RESIDUAL RENAL STONES, PERSONAL EXPERIENCE AND REVIEW OF LITERATURE

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Abstract

Removal of all stone and fragments is an important goal of every operations of renal stone. In spite of using modern techniques for stone manage still residual calculi (retained calculi) is an ever existing problem. Of a total 1059 patients with renal stone seen between 1994-2004, 557 patient under went operation, of these 117 showed false recurrent calculi with a total incidence of 21% false recurrent rate. The reasons for incomplete removal of renal calculi are discussed, methods of decreasing the incidence are mentioned. Accurate intra-operative localization of stones is the most important factor.

Introduction

Terms; pseudorecurrence, false recurrence, retained calculi, residual calculi: refers to stones or fragments of stones that were missed at operation¹. A wider term refers to a stone or stones that should have been removed at operation and can be appreciated as opacity or post-operative plain film².

Ideally all patients should be traced and examined post-operatively to rule out missed stones but this has seldom been performed¹.

The best policy for control of renal calculi includes treatment of urinary tract infection; correction of metabolic abnormalities and total surgical removal of all renal calculi³.

Retained calculi is a discouraging complication that occur: in up to 20% of patients following renal surgery⁴ However residual stones do not always grow but equally often pass spontaneously or remain unchanged⁵.

Residual stones larger than 5mm has high frequency of post operative

infection and result in moderate to severe deterioration of renal function^{2,6}. Stones less than 5mm in diameter and non radio-opaque stones are not regarded to be statically significant because their percentage is commonly not more than 5%². However patients with residual fragments or stones should be regularly followed up to monitor the cause of the disease because residual stones portend clinical significance through recurrent disease^{7,8}.

The criteria of successful stone free surgery is

- Accurate preoperative diagnosis.
- Accurate operative technique and judgment.
- Accurate intra operative localization of the stones.
- Incidence of false recurrence should be less than 10%.
- Post operative follow up even in asymptomatic patient by plain x-ray and ultrasound is even better than excretory urography⁹⁻²⁸.

- Symptomatic patients with residual calculi should be managed either by percutaneous nephrolithotomy or Extra Corporeal Shock Wave Lithotripsy.

Even with complete clearance of the calices there would be innumerable tiny foci of calcification in the renal parenchyma which could act as the nidus for further stone formation²⁷.

Material and method

From 1994-2004 in both Sulaimanya Teaching Hospital and Chwarbakh Teaching Hospital, 1059 patients with renal stones (parenchymal and pelvic) were treated. Age is between 3.5-70 years old, 244 were female and 815 were males. Of them, 557 underwent open surgery and 502 went for early post operative radiological or ultrasound exam to exclude retained stones. Stones less than 5mm regarded as insignificant (only statistically why not revealed here).

The patients were divided into three groups (Table I):

The first group included 225 patients who were interviewed personally and submitted to early post operative radiography and ultrasound.

The second group included those seen within three months postoperative after discharge from the hospital and also included all patients who showed no opacity on radiography several years post operatively or who had passed no stone yet. Collectively they were 300.

The third group included those seen in hospital suffering from repeated attacks of pain. They were 32 cases.

Results

In the first group residual stones were noted in 38 cases. In the second group there were 70 cases of residual stone (Table II). In the third group, nine showed retained calculi all of which were present in the upper ureter (proved by ultrasound excretory

urography). Follow up revealed damage of the stone in 5 cases spontaneously, 2 were treated by Extracorporeal Shock wave lithotripsy and the remaining by Domic basket. Regarding the difference in the incidence of missed stone among various types of surgical approach is shown in table III.

Anatrophic nephrolithotomy was used in 12 patients with complicated staghorn calculi, two of whom showed residual calculi of 7mm in either lower pole.

The largest stone that was left behind was 1.6cm which was found to be overshadowed by other stones in the lower pole after revision of pre and post operative radiographs.

We also noticed that 70% of kidney's operated on had their pelvis of the intra renal which made the operations difficult.

Discussion

The incidence of residual stones varies widely from one investigation to another. Accuracy depends on the performance of an x-ray exam at the end of the operation or at least before the patient leaves the hospital².

The incidence of residual calculi is relatively high in our study although it is relatively less in group 1. than group 2 (table I) which can be attributed to better preoperative localization of stones (by taking oblique views), preoperative discussion with radiologist regarding the exact number, site & size of the calculi, using a suitable surgical technique in a particular case (higher incisions, a rib resection, extend Gilvernet technique, temporary clamping of renal artery, gentle digital palpation, integrates and wash of the calices) and consulting more than one observer intra-operatively to compare the extracted stones with the x-ray finding.

A higher proportion of males was rewarded which is similar to what other investigator observed as the consequent of higher incidence of renal stones in males⁹.

Factors that contributed to retention of stones (especially in group 2) are more or less the same that were reported in other studies which include the presence of anatomical variations like intra renal pelvis and infundibular stenosis^{4,10}, T.O.D, the lack of expertise in anatomic nephrolithotomy for multiple and large branched calculi within complex collecting system¹², the lack of nephroscopy system^{13,14}, the lack of intra operative radiographs and ultra sonic facilities which are prerequisites for successful renal stone surgery, especially complicated one^{2,11} and the need for special technical facilities in the operating theater especially when concerning the paediatric age group^{14,15}.

Suggestions

Residual stone(s) comprise one of the most specific and important post operative complications of renal surgery and may result in persistent renal infection, new stone growth and renal impairment, on the other hand, silent obstruction is another potential complication of residual calculi and relying on post operative pain to determine necessity of post operative imaging places patient at risk for progressive renal damage due to unrecognized obstruction¹⁶.

In spite of modern techniques and progress in endourological manipulation of renal stone, residual calculi are an ever existing problem^{17,18,19}.

Open surgery still plays its role in treating renal stones²⁰ especially in our locality, in complex intra renal anatomy and in those who need concomitant renal reconstruction.

In order to decrease the incidence of a retained stones we think that the

following principles are a must-have pre-requisites: namely.

1. Sound preoperative planning with X-ray high quality with oblique view, and even tomography with maximal rotation in two directions, to localize the exact number, size site of the stones along with anatomical variations and concomitant congenital anomalies^{19,11,21,22}.
2. Expertise with various surgical techniques besides accurate intra operative localization of the retained stones by means of intraoperative x-ray ultrasound and nephroscopy.
3. Using coagulum pyelolithotomy for removal of multiple small stones and fragments^{13-15,24,25}.
4. Performing Onatropic nephrolithotomy for large branched calculi^{4,12}.
5. Recording to partial nephrectomy for selected cases where the lower pole is severely damaged^{20,29,30}.
6. Before the patient leaves the hospital he should have a check radiography to exclude retained calculi.

Conclusion

The etiology of retained missed stones is not one problem nor it is the sum of several problems but, rather a series of different problems.

The destruction between true recurrence in which new calculi are formed and retained stones where stones portion of stones were left behind at operation, can be made only if x-ray was taken at operation or shortly afterwards, repeated x-rays should follow at regular intervals.

It is difficult to estimate the true incidence of retained renal stones because the calculi may be symptomless and undetected or may pass (esp. small calculi) without attention.

Table I: Analysis of incidence of residual refined stones in 3 different groups of the total 557 patient

Patient group	No. of patient	Residual values	%
Group 1	225	38	16.88
Group 2	300	70	23.35
Group 3	32	9	28.12
Total	557	117	21.00

Table II: Analysis of 557 operations for renal stones performed on 434 males and 123 females

Types of operations	No. of patient	Male	Female
Pyelolithotomy	259	194	65
Nephrolithotomy	248	199	49
Partial nephrectomy	38	31	7
Anatrophicnephrolithotomy	12	10	2
Total	557	434	123

Table III: The incidence of missed stones according to the type of operation

Types of the operations	No. of patient	Recurrences	% in each particular operation
Pyelolithotomy	259	34	5.06
Nephrolithotomy	248	74	29.83
Partial nephrectomy	38	7	18.42
Anatrophicnephrolithotomy	12	2	16.60
Total numbers of operations	557	117	21.00 % of total operations

Table IV: The incidence of missed stones in relation to number of stones preoperatively

No. of stones preoperation	No. of patients	Recurrences	%
Single stone	153	11	7.1
Two stones	176	26	15.56
More than two stones	237	80	33.75

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