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Research Paper

Different Modalities in The Management of Nephrolithiasis

Medical Science

KEYWORDS : Urolithiasis, PCNL, URS, ESWL. Open surgery

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ABSTRACT

Background: Urinary stone is an end product of the complex pathological and biological phenomenon in urinary lithiasis. There are so many newer techniques introduced in the recent past. Each modality proved to be effective in the management of the nephrolithiasis according to its size and site. Because of the development of less invasive procedures such as (PCNL and URS) ; Non-invasive procedure (ESWL), many surgeons have changed their attitude from more invasive modalities to comparative less invasive and efficient modalities. Aims and objectives: 1)To strengthen the conclusion that non-invasive or minimal invasive procedures are better than more invasive procedures; or to come out with some newer data. 2) An attempt is made to understand the relationship among factors like age, sex, religion, occupation, dietary habits; site and composition of stone formation. 3) To consider the success of treatment modality along with their complications and long follow up for recurrence. Material and methods: The study consists of 35 patients of Nephrolithiasis, among them 20 patients selected from our hospital and 15 patients from another institution during the period of 1 year. Under following proforma, were the patients examined, investigated; being treated and followed up with one year of interval. Up to 9 mm size calculi were treated conservatively. Otherwise there was no case selection for invasive Vs. Minimal invasive modalities and it was on the surgeon's choice. Results: Highest incidence was recorded in 5th decade though stone disease was found in the range of 2nd to 6th decade. pain was the leading symptom in nephrolithiasis followed by burning micturition, frequency and hematuria. Stones between 1-3 cm size were managed with invasive and non - invasive modalities almost equally. Stone >3 cm size were found in 10 % cases among them 75 % managed with non-invasive and 25 % with invasive modalities. Conclusion: PCNL and ESWL are minimal to non-invasive newer developments in the treatment of nephrolithiasis. Almost all stones can be treated with combination of these modalities.

Introduction

Urinary stone is an end product of the complex pathological and biological phenomenon in urinary lithiasis.[1] The detailed study of stone constituents assume an important part in management and prevention of recurrence and for research purpose in urinary calculus disease. Urinary lithiasis is common worldwide. Surgical treatment helps in removal of stone but does not cure the patient and that is why we have to think over its recurrence and preventive aspects also. Exact aetiology of stone formation still remains obscure. There are so many newer techniques introduced in the recent past. Each modality proved to be effective in the management of the nephrolithiasis according to its size and site. Because of the development of less invasive procedures such as (PCNL[2] and URS[3]) ; Non-invasive procedure (ESWL[4]), many surgeons have changed their attitude from more invasive modalities to comparative less invasive and efficient modalities. The factors which have made this changes possible are application of imaging technique; endoscopic technology and advanced physics. No single "best" method of management of all stones exists. The urologist should recognize which patient is likely to be benefited by which available technique. Aims and objectives: 1)To strengthen the conclusion that non-invasive or minimal invasive procedures are better than more invasive procedures; or to come out with some newer datas. 2) An attempt is made to understand the relationship among factors like age, sex, religion, occupation, dietary habits; site and composition of stone formation. 3) To consider the success of treatment modality along with their complications, and long follow up for recurrence.

Material and methods

The study consists of 35 patients of Nephrolithiasis, among them 20 patients selected from our hospital and 15 patients from another institution during the period of 1 years. Under following proforma, were the patients examined, investigated; being treated and followed up with one year of interval. Up to 9 mm size calculi were treated conservatively. Otherwise there was no case selection for invasive Vs. Minimal invasive modalities and it was on the surgeon's choice.

Results

Table- 1 Size of the Stone

Stone size (cm)	A	B	C	Total	
<1	5	-	-	5	15 %
1.1-2	-	10	9	19	55 %
2.1-3	-	04	3	07	20 %
>3	-	01	3	04	10 %
Total	5	15	15	35	100 %

Table- 2 Operative procedures

No	Modality	No of Cases	%	Total
A	Conservative	5	14.2 %	5
B	Invasive Pyelolithotomy Nephrolithotomy Extended Pyelolithotomy Pyelo-Nephrolithotomy Nephrectomy	 8 4 1 1 1	 22.8 % 11.4 % 2.8 % 2.8 % 2.8 %	15
C	Noninvasive ESWL PCNL	 9 6	 25.7 % 17.14 %	15

Table- 3 Success rate

	A		B		C	
Retained Stone Recurrence	2 -	40 %	1 1	6.6 % 6.6 %	1 -	6.6 %
Success Rate	60 %		86.7 %		93.4 %	

Discussion

Stone < 1 cm size were managed conservatively in form of plenty of fluids orally. Stones between 1-3 cm size were managed with invasive and non - invasive modalities almost equally. Stone >3 cm size were found in 10 % cases among them 75 % managed with non-invasive and 25 % with invasive modalities. In 40 % cases, stones found in pelvis – treated mainly surgically. One

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patient with Nonfunctioning kidney was managed by Nephrectomy. Average duration of postoperative pain was less in noninvasive modalities as compared to open surgery.[5] All patients with pain were managed by giving analgesics and antispasmodics successfully. Average duration of postoperative hematuria was more in noninvasive procedure as compared to operative modality and they were managed conservatively successfully except one patient treated by PCNL developed severe hematuria and required one blood transfusion. All postoperative complications (wound infection: UTI and Urinary leakage were found in open surgery than in noninvasive procedures. Patients with wound infection were treated with daily dressing with antiseptic solution and antibiotics according to swab C/S successfully. Patients with UTI were treated with urinary antiseptics according to urine C/S successfully. Average duration of stoppage of urinary leak was 2.2 days. Overall, complication rate was higher in open surgery (60 %) than in noninvasive modalities (20 %).[6] In Meretyk Series, Complication rate in PCNL and ESWL group was 24.4 % as compared to 46.5 % in open surgery and it was almost comparable.[7]

The incidence of nephrolithiasis is maximum in 5th decade of life and males more affected. Leading symptoms of nephrolithiasis in order are renal pain; burning micturition; increased frequency of micturition; hematuria and pyuria. Almost all stones are radio opaque. So pain x-ray (KUB) is mandatory. It will also provide useful information regarding location of stone; number of stone; size and shape of stone. Ultrasonography provides additional information over AXR (KUB) especially when kidney is nonfunctioning or delayed functioning. This gives idea of size of kidney and cortical thickness. IVP examination is essential in all cases to know the function of kidney; to detect the location, size of the stone; to detect distal obstruction, along with back flow changes and congenital anomalies.[8] Almost all stones are amenable to open surgery and commonest procedure was pyelolithotomy followed by nephrolithotomy and extended pyelolithotomy. Usual post treatment complains are pain and hematuria and usual postoperative complications are wound infection; urinary tract infection; and urinary leakage. Rare post treatment complications in non-invasive modalities are peri-renal hematoma; perforation of collecting system, pleura etc. Complication rate is lower in minimal / noninvasive procedures as compared to more invasive procedures.[9] Noninvasive procedures are expensive than open surgery in our country. These economical factors should be weighed against relief of pain and morbidity that patients would have experienced had their stones been treated by open surgery. Success rate is almost equal in both invasive and noninvasive procedures. Advantages of Non Invasive Procedures: Minimal complication rate, Very short post procedure convalescence, Anaesthetic and intra operative risks are less, Outdoor base procedure.[10]

Conclusion

PCNL and ESWL are minimal to non invasive newer developments in the treatment of nephrolithiasis. Almost all stones can be treated with combination of these modalities.[11]

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