

Original article:

Improvement in renal function in CRF with stone disease by nephrostomy tube drainage

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Abstract:

Introduction: Renal stone disease is one of the common causes of CRF in stone belt areas. Patients with bilateral stone disease or stone disease of unilateral functioning kidney often present with deranged renal function tests. It is therefore of major importance to drain the affected kidney to relieve the hydronephrosis and hence, the functional compromise on the kidney.

Materials and Methods: We included 50 patients of CRF with stone disease who underwent percutaneous nephrostomy for the drainage of the pelvicalyceal system from August 2017 to February 2019. The patients were evaluated with an ultrasonographic examination and a renal function test at the time of first exposure. The patients who had loss of corticomedullary differentiation in the first ultrasound were excluded from the study.

Results and Conclusion: Nephrostomy tube insertion is a safe and effective method to achieve renal decompression and improve renal function in cases of chronic kidney disease with stone disease.

Introduction:

Renal stone disease is one of the common causes of CRF in stone belt areas. Patients with bilateral stone disease or stone disease of unilateral functioning kidney often present with deranged renal function tests. It is therefore of major importance to drain the affected kidney to relieve the hydronephrosis and hence, the functional compromise on the kidney. This can be accomplished in one of two ways; via a DJ stent or via a nephrostomy tube. Both are equally efficacious, but the insertion of DJ stent requires anaesthesia as well as expensive instruments. A nephrostomy, however, requires only local anaesthesia and a USG or a fluoroscopy machine. Also a nephrostomy can be safely performed under local anaesthesia obviating the need for pre-anaesthetic preparation and thus urgent decompression. Nephrostomy tube insertion is, therefore, a cost effective, safe and effective method of renal decompression.

Aim: To evaluate the efficacy of nephrostomy tube insertion in improving renal function in patients with stone disease and CRF.

Materials and Methods:

We included 50 patients of CRF with stone disease who underwent percutaneous nephrostomy for the drainage of the pelvicalyceal system from August 2017 to February 2019. The patients were evaluated with an ultrasonographic examination and a renal function test at the time of first exposure. The patients who had loss of corticomedullary differentiation in the first ultrasound were excluded from the study. The patients underwent percutaneous nephrostomy insertion and the serum creatinine levels were measured again at two weeks. The results were then tabulated. The patients with a post-nephrostomy creatinine level <3 mg/dL were taken for stone clearance via either PCNL or URSL as the case indicated.

Results:

There were 50 patients included in the study with 41 male and 9 female patients. The average age of the patients was 44.5 years. The mean creatinine value pre-operatively was 5.0 mg/dL while the mean post operative creatinine value was 2.19 mg/dL with a mean decrease of 2.8 mg/dL. The most common pathology requiring PCN tube drainage was bilateral renal calculi (20, 40%) which required bilateral drainage. Complications were seen in four cases. Three patients required re-insertion of PCN tube while one patient developed septicaemia. All but 6 patients that is 88% of the patients achieved a post-nephrostomy creatinine level of less than or equal to 3.0 mg/dL and were taken for stone clearance surgery.

Table 1: Age distribution

S. no.	Age group	No. of patients	Percentage
1.	0-10	1	2%
2.	11-20	1	2%
3.	21-30	4	8%
4.	31-40	10	20%
5.	41-50	21	42%
6.	51-60	9	18%
7.	61-70	3	6%
8.	71-80	1	2%
9.	Total	50	100%

Table 2: Complications:

S. No.	Complication	Number	Percentage
1.	Acute bleeding	None	0%
2.	Failed access	3	6%
3.	Septicemia	1	2%
4.	Adjacent organ injury	None	0%

Discussion:

Nephrostomy tube insertion has been used for renal decompression since 1955 when the technique was described by Goodwin et al(1). It is a simple and effective technique and can be done under either fluoroscopic or ultrasonographic or combined guidance with equal efficacy(2). Successful results can be expected in over 90% of percutaneous nephrostomies, with major complications limited to 4% and minor complications to 15%.(3)

PCN is usually performed when a retrograde stenting is not possible. It may be due to difficult anatomy or lack of technical expertise. Comparative studies have been carried out between percutaneous nephrostomy and retrograde ureteric stenting. Pearle et al. found no difference in clinical efficacy, or patient preference between the two procedures and concluded that the choice of procedure may be based on particular circumstance of the patient and availability of facilities to carry it out (4).

Azotemia due to bilateral obstruction or obstruction of a single functioning kidney has been the most frequent indication for nephrostomy(3). A nephrostomy tube provides alternate drainage for the obstructed system and frequently results in significant reduction of azotemia(5).

The incidence of major complications in our study was 8% overall. Minor complications such as those related to tube malfunction, leakage, dislodgment and encrustations. Picus et al. summarized early complications inherent with fluoroscopy-guided PCN, being the most common acute bleeding requiring transfusion (< 5%), failed access (< 5%), adjacent organ injury: bowel, spleen, lung (< 1%), and septicemia (< 1%)(6). In our series however no patient developed acute bleeding and the most common complication was tube dislodgement needing reinsertion. One patient developed septicaemia which was the most common complication described by Stables et al(3). No patient had an adjacent organ injury in our study.

Conclusion:

Nephrostomy tube insertion is a safe and effective method to achieve renal decompression and improve renal function in cases of chronic kidney disease with stone disease.

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