



A STUDY OF COMPLICATIONS OF PERCUTANEOUS NEPHROLITHOTOMY PERFORMED FOR THE MANAGEMENT OF RENAL CALCULUS:

Urology

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ABSTRACT

The treatment for nephrolithiasis has been on shift from the past few decades. The standard open procedure has been completely replaced by minimal access surgery except in very few conditions. Percutaneous nephrolithotomy is a relatively non-invasive procedure, has now established as a surgical treatment of choice for nephrolithiasis owing to advancement in the instrumentation and techniques which have improved treatment outcomes and less morbidity. It is standard surgical treatment for staghorn calculi, large volume calculi, upper tract calculi refractory to other modality, difficult lower pole stone, calculi in anatomically abnormal kidneys. As with other surgical procedure, PCNL is also associated with certain complications which can occur preoperatively as well as post operatively. Complications which can occur are, mainly while accessing kidney in form of haemorrhage or collecting system injury or adjacent organ injury, extravasation and fluid absorption leading to electrolyte imbalance in postoperative period, septicaemia, renal loss and mortality. A Sincere effort has been put in this study to understand the complications of the percutaneous nephrolithotomy performed for the management of renal calculus.

KEYWORDS

percutaneous, nephrolithotomy, renal calculus, haemorrhage.

Introduction:

The treatment for nephrolithiasis has been on shift from the past few decades. The standard open procedure has been completely replaced by minimal access surgery except in very few conditions. Percutaneous nephrolithotomy is a relatively non-invasive procedure, has now established as a surgical treatment of choice for nephrolithiasis owing to advancement in the instrumentation and techniques which have improved treatment outcomes and less morbidity.(1) It is standard surgical treatment for staghorn calculi, large volume calculi, upper tract calculi refractory to other modality, difficult lower pole stone, calculi in anatomically abnormal kidneys.(1,2) As with other surgical procedure, PCNL is also associated with certain complications which can occur preoperatively as well as post operatively. Complications which can occur are, mainly while accessing kidney in form of haemorrhage or collecting system injury or adjacent organ injury, extravasation and fluid absorption leading to electrolyte imbalance in postoperative period, septicaemia, renal loss and mortality.(3,4). The evolution of minimal invasive procedure in form of PCNL has revolutionized the treatment of renal calculi. As no surgical intervention is 100% safe, so is the PCNL. Complications associated with PCNL ranges from minor complications such as Post-operative pain & fever to major complications such as renal vascular injury or adjacent organ injury. Complications rate associated with PCNL reported up to 83% out of which majority is insignificant.(5,6) The complications of PCNL can be divided in major and minor complications. Bleeding is one of the common complications of the PCNL but haemorrhage which requires intervention is less. It can occur at various stages of the PCNL. It can occur at the time of access which is more of venous in nature and can occur while dilating percutaneous tract or injury to capsule or parenchyma.(7) Vascular injury increases when the tract passes close to the renal hilum. Incidence of vascular injury increases with number of punctures, stone size, and location of stone.(8,9). A Sincere effort has been put in this study to understand the complications of the percutaneous nephrolithotomy performed for the management of renal calculus.

Aims and Objectives:

This study to understand the complications of the percutaneous nephrolithotomy performed for the management of renal calculus.

Materials and Methods:

180 patients who underwent PCNL at Travancore Medical College, Kollam were studied. March 2015 to March 2017 were reviewed retrospectively. The data were collected and studied and literatures were reviewed in relation to complications associated with PCNL. All procedure was done in prone position. Puncture was done under fluoroscopic guidance. Tract was dilated using Alken fascial Dilators, usually up to 24 Fr to 30 Fr. Number of tract and site depends on the

size and location of the stone. Rigid Nephroscope was used. Irrigation was done using Normal saline. Stones were fragmented using Pneumatic lithotripter and removed using tri-pronged and alligator grasping forceps. Double Pigtail ureteral stent were kept at the end of procedure in selected cases. Abdominal drain was placed in the nephrostomy tract and then blocked for the purpose of tamponade and opened on 1st postoperative day. Nephrostomy tube was removed on 2nd post-operative day. Ureteral stent were kept for 3 weeks and review X-Ray KUB was done before removal of stent.

Results:

Table 1: Mean Age

Total Patients	Mean Age	Std Deviation
180	31.67 years	2.7 years

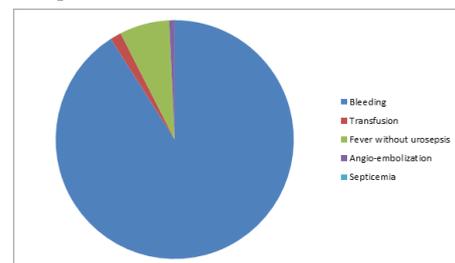
Table 2: Complications:

Complications:	Frequency
Bleeding	121
Transfusion	02
Fever without Urosepsis	9
Angio-embolization	01
Septicaemia	01
Injury to other organs	Nil

Table 3: Table for Co-relation

Frequency (Bleeding)	X-Value	P-Value
121	0.728	0.073

Image 1: Complications



Discussion:

Post-operative fever/ sepsis can occur. Transient post-operative fever is a common occurrence following PCNL which can range from 15-30%. On the contrary fever with urosepsis is a rare complication. Septicaemia can be seen as a result of infection introduced via the access tract to the kidney or working with the infected stones or system. Following PCNL, fever is significantly higher and more

frequent in patients with infected urinary stones than in those with sterile stones and patient requiring post-operative transfusion one or more than one. Septicaemia is low in patients treated with appropriate pre-operative antibiotics which can be given either as a single dose or short course prophylaxis. Prophylactic antibiotics and drainage of a pyonephrotic kidney is mandatory prior to PCNL. Time of Operation, amount of irrigation fluid, pressure in collecting system, post-operative transfusion, multiple puncture, positive pelvic urine and stone culture increases the risk of fever and sepsis. Hormonal and hemodynamic changes can occur during and after PCNL owing to its invasive nature and continuous irrigation to vital organ. There is tendency of Hyponatremia and metabolic acidosis Adjacent Organ Injury though occurs less but accounts for major morbidity associated with PCNL. Injury to pleura and subsequent pneumothorax and hydrothorax can range from 0.7% to 2.4%. Injury to pleura is more common with supracostal approach in comparison to infracostal approach. Injury to abdominal organs may occur to colon, liver, spleen, small bowel.

Conclusion:

Although associated with a marginally higher complication rate, but most of them were minor further these can be overcome by establishing a protocol under skilled surgical experience.

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