DOI: https://doi.org/10.53350/pjmhs2023171530

ORIGINAL ARTICLE

An Evaluation of Complications of Ultrasound Guided Percutaneous Nephrostomy in Cases of Obstructive Uropathy

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ABSTRACT

Objective: To evaluate the complications of ultrasound guided percutaneous nephrostomy in cases of obstructive uropathy at tertiary care hospital.
Study design: Case series
Duration of study: From February 2022 to August 2022.
Setting: Department of Urology, Sheikh Zaid Hospital, Rahim Yar Khan**.**
Material and methods: Total 133 patients having age between 20-40 years either gender with obstructive uropathy due to ureteric obstruction caused by (impacted ureteric stones, PUJ obstruction, carcinoma prostate involving ureters, iatrogenic ureteric injury and bladder tumors) were included in the study and post procedure complications were evaluated.
Results: Mean age was 44.83 ± 13.05 years. Regarding presenting symptoms, total 94 (71%) patients had decreased urine amount, 29 (22%) patients had flank pain while 10 (7%) patients had fever. Septicemia was found in 11 (8.33%) patients, bleeding in 4 (3%) patients followed by PCN dislodgement in 8 (6%) patients.
Conclusion: Results of this study revealed that septicemia was the most common complication in cases of obstructive uropathy after PCN. More than 50% patients were between 41-60 years. Male population was commonly suffered from obstructive uropathy. Most of the patients had bilateral obstructive uropathy and decreased urine output was common presenting symptom.
Keywords: PCN, obstructive uropathy, nephrostomy, bleeding, blockage

INTRODUCTION

Obstructive uropathy, a disorder characterized by obstruction of the urinary system, can result in substantial morbidity and a decline in quality of life.[1] The obstruction can develop anywhere in the urinary system and is caused by a number of reasons, including tumors, stones, strictures, and birth defects. In order to restore normal urine flow, blockage must be removed in order to treat obstructive uropathy.[2-6] Ultrasonography-guided percutaneous nephrostomy is one of the most prevalent minimally invasive techniques used to treat obstructive uropathy (PCN).[7] This surgery includes the insertion of a tube through the skin into the renal collecting system, allowing urine to be drained from the affected kidney.[8] Ultrasonography is utilized during the surgery to view the position of the obstruction and guide the insertion of the tube, therefore lowering the risk of complications. PCN is a less risky and efficient method for treating obstructive uropathy.[9]

It gives quick alleviation of the blockage and is outpatient-performable, reducing the requirement for hospitalization. Moreover, PCN has a high success rate, with up to 90% of patients having a marked increase in urine flow.[10] In addition to its advantages, PCN is cost-effective, as it avoids the need for more invasive and costly surgical treatments. In addition, PCN can be administered as a temporary remedy while the underlying cause of the blockage is addressed, so minimizing the risk of future renal damage.[11]

The study of complications associated with ultrasonography-guided PCN in obstructive uropathy is crucial for evaluating its safety and efficacy. Potential complications include bleeding, infection, pain at nephrostomy site and understanding these occurrences can lead to enhanced patient care and improved outcomes for those undergoing PCN.[12]

The aim of this research was to assess the adverse effects associated with percutaneous nephrostomy guided by ultrasound in individuals with upper obstructive uropathy within the local community. The goal was to identify a simple and safe urinary diversion procedure that can be used as treatment for patients experiencing obstructive uropathy.

MATERIAL AND METHODS

Department of Urology carried out this study of case series. Sheikh Zaid Hospital, Rahim Yar Khan from February 2022 to August 2022. Total 133 patients having age between 20-40 years either gender with obstructive uropathy due to ureteric obstruction caused by (impacted ureteric stones, PUJ obstruction, carcinoma prostate involving ureters, iatrogenic ureteric injury and bladder tumors) were included in the study.

Patients who had bladder outflow obstruction causing obstructive uropathy, those with severe coagulopathies, and those with liver or multiorgan failure or chronic terminal illness that prevented them from tolerating the required position for percutaneous nephrostomy (PCN) were excluded from this study. Prior to the study, ethical approval was obtained from the hospital's ethical committee, and written informed consent was obtained from each patient. Detailed medical history was collected, and all baseline investigations were performed. The patients were then informed about the risks and complications associated with the procedure, and after obtaining their consent, percutaneous nephrostomy was performed under ultrasound guidance with the use of 5-10 ml of 1% lignocaine subcutaneously at site of puncture. Any complications, such as bleeding, blockage of PCN, dislodgement of PCN or septicemia, were noted during or after the procedure for up to one week, and recorded on a specially designed proforma.

The data collected was analyzed using computer software SPSS version 16. Mean and standard deviation were calculated for quantitative variables such as age, while frequencies and percentages were calculated for qualitative variables such as gender, presenting symptoms, side of obstruction, obesity and complications (bleeding, blockage and PCN dislodgment or septicemia). Effect modifiers such as age, gender and obesity were controlled through stratification. Post-stratification chi square was applied to determine their effect on the outcome, and a p-value ≤ 0.05 was considered significant.

RESULTS

Of the total 133 patients with obstructive uropathy were selected. Mean age was 44.83 ± 13.05 years. Regarding presenting symptoms, total 94 (71%) patients had decreased urine amount, 29 (22%) patients had flank pain while 10 (7%) patients had fever. (Fig. 1) Most of the patients (78.59%) found with bilateral obstructive uropathy followed by 32 (24%) patients had right side obstructive uropathy and 23 (17%) patients had left side

obstructive uropathy. (Fig. 2) Septicemia was found in 11 (8.33%) patients , bleeding in 4 (3%) patients followed by PCN dislodgement in 8 (6%) patients. (Fig. 3)

Age group 20-40 years had 42 (31.58%) patients while age group 41-60 years had 91 (68.42%) patients. In age group 20-40 years, septicemia was found in 5 (11.9%) patients, bleeding in 1 (2.4%) patient, PCN dislodgement in 2 (4.8%) patients and 34 (81%) patients had no complication. In age group 41-60 years, septicemia was found in 6 (6.6%) patients followed by bleeding in 3 (3.3%) patients, PCN dislodgement in 6 (606%) patients. Post operative complications had insignificant (P=0.743) association with age group. (Table 1)

Male and female patients were 76 (57.14%) and 57 (42.86%) patients respectively. Septicemia was found in 8 (10.5%) male patients, bleeding in 2 (2.6%) patients, PCN dislodgement 6 (7.9%) patients. In female patients, septicemia was noted in 3 (5.3%) patients, bleeding in 2 (3.5%) patients, PCN dislodgement in 2 (3.5%) patients. Insignificant (P=0.472) association of complications with gender was found. (Table 2)

Out of 32 (24.06%) obese patients, septicemia was seen in 3 (9.4%) patients followed by bleeding in 2 (6.2%) patient and PCN dislodgement in 2 (6.2%) patients. Among 101 (75.94%) non-obese patients, total 8 (7.9%) patients had septicemia followed by 2 (2.0%) patients had bleeding and 6 (5.9%) patients had PCN dislodgement. Association of complications with obesity was not significant (P=0.649). (Table 3)

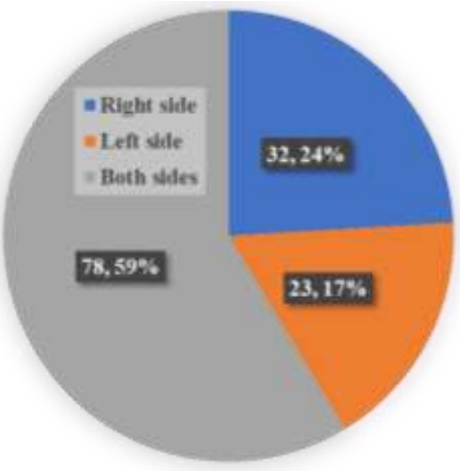

Fig. 2: Side of obstruction

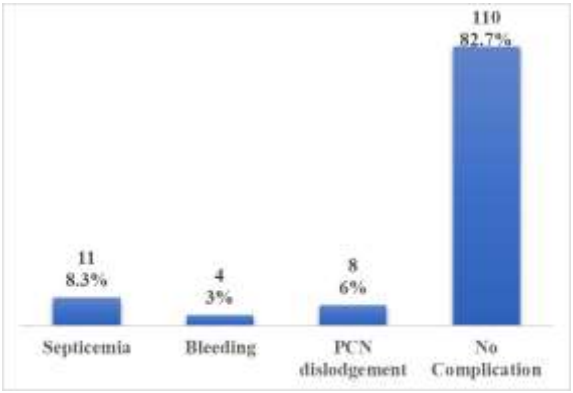

Fig. 3: Frequency of complications

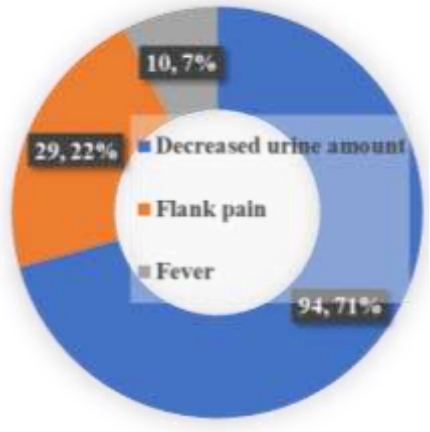

Fig. 1: Presenting symptoms

Table 1: Association of post-operative complications with age group

Age group	Complications				Total	P value
	Septicemia	Bleeding	PCN dislodgement	No Complication		
20-40 years	5 11.9%	1 2.4%	2 4.8%	34 81.0%	42 31.58%	0.743
41-60 years	6 6.6%	3 3.3%	6 6.6%	76 83.5%	91 68.42%	
Total	11 8.3%	4 3.0%	8 6.0%	110 82.7%	133	

Table 2: Association of post-operative complications with gender

Gender	Complications				Total	P value
	Septicemia	Bleeding	PCN dislodgement	No Complication		
Male	8 10.5%	2 2.6%	6 7.9%	60 78.9%	76 57.14%	0.472
Female	3 5.3%	2 3.5%	2 3.5%	50 87.7%	57 42.86%	
Total	11 8.3%	4 3.0%	8 6.0%	110 82.7%	133	

Table 3: Association of post-operative complications with obesity

Obesity	Complications				Total	P value
	Septicemia	Bleeding	PCN dislodgement	No Complication		
Obese	3 9.4%	2 6.2%	2 6.2%	25 78.1%	32 24.06%	0.649
Non-obese	8 7.9%	2 2.0%	6 5.9%	85 84.2%	101 75.94%	
Total	11 8.3%	4 3.0%	8 6.0%	110 82.7%	133	

DISCUSSION

Percutaneous nephrostomy (PN), initially introduced by Goodwin in 1955, is now a well-established interventional procedure that has proven highly successful in preserving renal function in cases of hydronephrosis.[13] Percutaneous nephrostomy (PCN) is commonly used for several reasons, indications such as relieving blockages in the renal collecting system, enabling minimally invasive urologic procedures, facilitating urinary diversion, and alleviating pain caused by renal calculi or pregnancy.[14] There are many techniques to perform PCN such as ultrasound guided, fluoroscopic guided or CT guidance.[15]

This study was planned to evaluate the complications of ultrasound guided percutaneous nephrostomy in cases of obstructive uropathy. Total 133 patients with obstructive uropathy were selected. Mean age was 44.83 ± 13.05 years. Septicemia was found in 11 (8.33%) patients followed by bleeding in 4 (3%) patients, PCN dislodgement in 8 (6%) patients. In one study by Saeed K et al,[16] total 196 patients of obstructive uropathy manage with PCN. They reported sepsis in 0.51% patients and PCN dislodgement was occurred in 5.61% patients. In their study mean age was 36.40 ± 11.59 years. Similarly in study of Ahmad N et al,[17] total 184 patients of obstructive uropathy were managed with PCN. Mean age was 41.74 ± 7.91 years. In this study Septicemia was occurred in3.80% patients, bleeding in 2.17% patients and PCN dislodgement or blockage in 4.89% patients. Male patients were 127 and female patients were 57. In another study by Arnuntapong P et al,[18] of the 307 patients performed PCN, 29.3% were males and 70.7% were females and age range was from 35 to 78 years; with the mean of 55.2 years. catheter dislodgement was seen in 3.25% patients.

Farooq K et al[19] recruited 145 patients obstructive uropathy during the study period, total 79 were males and 66 were females, age range was 13-70 years with mean ± S.D is 44 ± 18.02. nephrostomy tube dislodgment was occurred in 24 patients and Sepsis was occurred in 19 patients. PCN dislodgement and sepsis were occurred in 16.6% patients and 13.1% patients respectively. In 2010 study conducted by Karim R et al[20] complications observed after PCN were macroscopic hematuria in 9.6%, dislodgement of catheter in 19% and sepsis in 10.3% of cases. In a study by Ali SM,[21] total 300 patients of obstructive uropathy were enrolled. Sepsis was found in 2% patients, retroperitoneal haematoma in 1.6% patients, bleeding in 0.6%, urinoma in 0.3% patients, dislodgement of catheter in 2.3% patients. Gebreselassie KH et al[22] recruited 110 patients who underwent PCN, females were 70% and rest were males, Bilateral Obstructive Uropathy was diagnosed in 60% of patients, with right in 22.7% patients and with left side in 17.3% patients. Presenting symptoms were decreased urine amount in 67.3% patients, flank pain in 28.2% patients and fever in 4.5% patients. Ahmad I et al recruited 200 patients who underwent PCN, 4.5% of patients experienced bleeding and tube blockage or dislodgment each, while septicemia was observed in 3.5% of patients.[23]

CONCLUSION

Results of this study revealed that septicemia was the most common complication in cases of obstructive uropathy after PCN. More than 50% patients were between 41-60 years. Male population was commonly suffered from obstructive uropathy. Most of the patients had bilateral obstructive uropathy and decreased urine amount was common presenting symptom.

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