ORIGINAL ARTICLE

Demographics and Stone Clearance Rates for Percutaneous Nephrolithotomy in a Tertiary Care Hospital

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ABSTRACT

Background: Percutaneous stone surgery is the gold standard for removing large renal calculi. In light of the increase in prevalence and size of renal stones being addressed in recent years, numerous advances have been made in attempts of improving the morbidity, efficacy, and technical ease of stone clearance. In this article, we discussed the data including age, gender, stone size and clearance in the patients treated with PCNL.

Methods: 205 consecutive cases of PCNL were performed between July 2012 and December 2017 by a single urologist. All cases have been included for analysis. Data was recorded on a formatted questionnaire. Results were analyzed using SPSS.

Results: A total of 205 cases were operated for renal stones between July 2012 and December 2017. 140 of our patients were male while 65 were female. The minimum age was 2 while the eldest patient was 87 year old, the minimum stone size was 1.8 cm and maximum was 6.2 cm the mean size was 3.51 cm with a standard deviation of 0.745. The mean clearance was 98.70% with a minimum of 80% and maximum of 100%.

Conclusion: PCNL is a safe and better alternative to conventional pyelolithotomy, the stone clearance rates are excellent. With the progression to mini and micro PCNL we expect to make the surgery even more safer and comfortable for the patient.

Keywords: Nephrolithotomy, percutaneous, PCNL, renal stone

INTRODUCTION

Urolithiasis has long plagued human civilization. Management of patients suffering from urinary tract calculi is considered to be a health care problem because of its prevalence and recurrence. Within the past two decades, for instance, the prevalence of diabetes has increased two fold; along with it, the frequency of stone-related Emergency Department visits has also risen from 178 in 100,000 visits to 340 in 100,000, nearly doubling in number[1,2]. Over time, an increase in the absolute size of stones diagnosed has increased as well.

Renal stone treatment has significantly evolved from open surgery to minimal invasive surgical procedures. Since the first report of the removal of renal stones via nephrostomy by Rupel and Brown in 1941[3], there have been significant improvements in techniques, instruments, and ex-perience. Fernastom and Johansson first reported percutaneous nephrolithotomy (PCNL) in 1976[4].

Percutaneous nephrolithotomy (PCNL) is a urological minimally-invasive procedure to extract kidney stones by means of percutaneous access[5]. Although extracorporeal shock wave lithotripsy (ESWL) and flexible ureteroscopic stone removal are widely used modalities for renal stones, PCNL is still needed for selected cases according to the size, position, shape, and composition of the stones[6]. Recently European Association has considered PCNL as first option for large, multiple or inferior calyx stones[7]. Open stone surgery has been replaced by PCNL because of its cost effectiveness, lower morbidity, shorter operative time and lower postoperative complications[8,9].

Percutaneous nephrolithotomy (PCNL) became a standard technique to address complex, large renal stones during the last two decades of the twentieth century[10]. Given its decreased morbidity, lower cost, and shorter duration of hospitalization compared to open nephrolithotomy, PCNL has rendered open stone extraction obsolete[11]. In an era when the demographics of the general population are leading to the production of larger stones in unhealthier patients, PCNL is more relevant than ever.

The aim of this study is to present the different factors including age, sex, gender and stone clearance rates in the patients treated with PCNL in a Tertiary Care Hospital from July 2012 to December 2017.

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MATERIALS AND METHODS

205 cases of PCNL were performed between July 2012 and December2017. All cases have been included for analysis. The inclusion criteria included stone size more than 2 cm, absence of UTI, normal clotting profile, and a patient who willingly agrees to an informed consent for PCNL. All patients underwent preoperative assessment with CBC, PT APTT, renal function testing and urine culture. The preferred radiological investigations included a non contrast enhanced CT KUB and occasionally an IVU where function and anatomy was in doubt. Data regarding age, gender and stone size and clearance were collected and analyzed with SPSS.

RESULTS

The patients underwent 205 PCNLs**.** Minimum age of the patient was 2 years while maximum age was 87 years. Mean age was 39.04 years, with a standard deviation of 14.57. Total number of males was 140 and females were 65. Minimum size of the stone was 1.8cm while maximum size was 6.2 cm. Mean stone size was 3.51cm, with a standard deviation of 0.74. Stone free rate was 100% in

164 patients, 95% in 35 patients, 90% in 3 patients and 80% in 3 patients. The mean clearance rate was 98.70. All procedures were conducted with the patient prone

DISCUSSION

Epidemiological studies have implicated a range of contributory dietary, medical, environmental, and genetic factors in the pathophysiology of this disease. Although stone disease appears to have declined among males since 1970, the overall incidence of stone disease has remained stable. This is explained by an increased incidence in females of all ages. The male-to-female ratio reflects this, having declined from 3.1:1 in 1970 to 1.3:1 in 2000[12]. Our study also supports these findings its Peak incidence in females has been shown to occur at a younger age of 20–29 years, compared with 60–69 years for males.

In our centre we have started to perform mini PCNL, we have performed this procedure for a 2 year old child with a 1.8 cm stone in the renal pelvis. The results of the Mini PCNL are very encouraging and with the introduction of Holmium laser this can be offered to patients with larger stone burden. PCNL should be offered as first line therapy for patients with a total renal stone burden > 20 mm. In a RCT comparing PCNL to URS for >2 cm renal pelvic stones, the stone free rate was higher for PCNL compared to URS (94% versus 75%)[13]..

CONCLUSION

PCNL is the preferable and safe treatment option for large renal stones(>2mm) irrespective to age and gender.

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