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Mean Operative Time And Stay In Hospital Between Transurethral Removal Using Nephroscope And Percutaneous Cyst-lithotripsy In The Treatment Of Large Bladder Calculi

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Abstract:

Background: urinary bladder stones comprise 5% of cases of urolithiasis1, with single calculi being identified in most instances but numerous calculi in 25% of cases2. With the development of endourological fiberoptic equipment and extracorporeal shockwave lithotripsy (swl), there have been notable modifications to managing and treating vescicolithiasis3. Thanks to this Study, we shall know the local amount of hospital stay and operating time between the two operations. We will suggest the method that results in a shorter surgical time and a shorter hospital stay since both have been successfullydocumented in the literature.

Objective: to compare the length of hospital stay and average operating time for transurethral removal of big bladder calculi using a nephroscope with percutaneous cystolithotripsy.

Study design : A randomized controlled trial

Duration and place of study: from January 1, 2020, to December 31, 2020, at the Department of Urology, Institute of Kidney Diseases and Transplant, Peshawar

Methodology: The Study used a randomized controlled trial (RCT) strategy, examining 60 individuals (30 in each group). The study covered all patients aged 20 to 65 years, female or male, presenting with bladder stones larger than 3 cm and with any number of rocks. All of the individuals who presented with renal insufficiency (defined as creatinine more than 3 mg/dl), active renal tract infection (defined as a fever greater than 38.5°c and positive urine culture), and obesity (defined as BMI greater than 30) were not included in the Study. The included patients were split into two groups using permitted blocks and blocked randomization. Patients in group b had percutaneous cystolithotripsy, whereas patients in group A underwent transurethral removal using a nephroscope. Following the operation, the length of hospital stay was calculated by tracking each patient until they decided to be discharged. After entering all of the data on the proforma into the statisticalprogram SPSS version 23.0, a comparison analysis was carried out.

Results: according to our analysis, nine patients (30%) in group A were between the ages of 20 and 40, and 21 patients (70%) were between the ages of 41 and 65. In contrast, 15 (50%) patients in group b were between 20 and 40, and 15 (50%) were between 41 and 65. Seven patients (23%) and 23 patients (77%) in Group A were female, and in contrast, six patients (20%) and 24 patients (80%) in Group B were female. Group A had an average surgical duration of 35.06 minutes(sd ± 5) and an average hospital stay of 2.6 days (sd ± 0.9). In contrast, group b saw an average surgical duration of 44.06 minutes (sd ± 7) and an average hospital stay of 3.4 days (sd ± 1.02).

Conclusion: The Results Of Our Study Indicate That, When Treating Big Bladder Calculi, Transurethral Removal With ANephroscope Had A Shorter Mean Operation Time And Hospital Stay Than Percutaneous Cystolithotripsy.

Keywords: Mean Operative Time, Hospital Stay, Nephroscope, Percutaneous Cystolithotripsy, Bladder Stones

Authors Contribution
HA. Concept & Design of Study And Drafting**ZA** Data Analysis and Critical Review**, ZA, SR**: Final Approval of version

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Introduction:

Urolithiasis affects 5% of people, with most having one calculus and 25% having many1. Endourological fiberoptic technology and extracorporeal shockwave lithotripsy (SWL) have changed vesicolithiasis care and treatment2. Open vesicolithotomy, PCCL, TUCL, and SWL are used to remove large bladder stones. However, the standard bladder calculi treatment is still debatable3. The suggested method should be successful, non-invasive, and offer multiple treatment options. Open vesicolithotomies are rare4. In many circumstances, urethral lithotripsy can treat adult bladder calculi. However, the tiny urethra makes these devices unsuitable for children5. SWL is less effective for treating huge bladder calculi since it requires many sessions and makes stone particles difficult to move in urine. Percutaneously accessing the bladder via the suprapubic route avoids a restricted urethra7. A transurethral cystoscopic approach to large bladder stone removal is faster and more effective8. The suprapubic percutaneous method can also remove bladder calculi stones rapidly and effectively utilising percutaneous nephrolithotomy (PCNL) or tract dilation9. Each method has pros and cons. Literature describes transurethral cystolithotripsy (TUCL) employing cystoscope and nephroscope directly or indirectly via the amplatz sheath. Fragment removal is the hardest and longest part of cystolithotripsy10. One study found that transurethral removal with a nephroscope took 33.6 + 7 minutes and percutaneous cystolithotripsy (PCCL) 47.8 + 17.6 minutes. The transurethral removal group using a nephroscope had a mean hospital stay of 1.3 + 0.7 days, while the PCCL group had 2.12 + 0.6 days11. No stones were found in each group. In another study, transurethral removal with a nephroscope took 32.7 +/- 8.7 minutes, while percutaneous cystolithotripsy (PCCL) took 34.3 +/- 7 minutes. In the same Study, the nephroscope-assisted transurethral removal group had a mean hospital stay of 1.2 + 0.5 days, while the PCCL group had 2.1 + 0.4 days12. Another study found that nephroscope-assisted transurethral removal took 32.1 + 8.5 minutes. Percutaneous cystolithotripsy (PCCL) took 46.3 + 7.3 minutes on average. In the same study, the nephroscope-assisted transurethral removal group had a mean hospital stay of 1.4 + 0.6 days, while the PCCL group had 2.1 +0.15 days13. The purpose of this study is to compare PCCL versus nephroscope-assisted transurethral resection for adult bladder stones. This Study was conducted after a thorough literature search revealed many treatment methods, some of which were more effective in stone clearance rates. However, the length of each surgery and hospital stay is a big benefit because it influences patient and hospital costs. This Study14 will determine the local hospital stay and operating time between the two procedures. This procedure has been shown to save surgical time and hospital stay, thus we will recommend it. From January 1 to December 31, 2020, the Department of Urology, Institute of Kidney Diseases and Transplant, Peshawar, conducted the present Study. It was an RCT with 60 participants (30 per group). In nephroscope-based transurethral removal Group 6, the mean surgery time was 33.6 + 7 minutes, and in PCCL Group 6, 47.8 + 17.6 minutes. With 5% significance and 80% power, the WHO algorithm calculated the sample size from these numbers. Non-probabilistic (consecutive) sampling was used15. The study included all male and female patients aged 20–65 with bladder stones greater than 3 cm and any number of rocks. Despite all patients having renal insufficiency, creatinine levels greater than 3 mg/dl, an active renal tract infection with a temperature of at least 38.5°C, and a positive urine culture, the Study excluded obese individuals with a BMI of 30 or more. Every patient underwent a full history, examination, and standard investigations16. Each patient's bladder stone was confirmed by ultrasound. The patients were divided into two groups using authorised blocks and blocked randomization. Group B had percutaneous cystolithotripsy, while Group A underwent nephroscope-assisted transurethral removal. Every treatment was overseen by a skilled consultant urologist17. The surgery time comprised anaesthesia and stone removal. Each patient was tracked until release to determine hospital stay after surgery. A comparison analysis was performed18 after inputting all proforma data into SPSS version 23.0. The mean and standard deviation represented quantitative data such age, weight, height, BMI, stone size, number of stones, operation time, and hospital stay. Category factors like gender were expressed as percentages and frequencies. The two groups' mean active times and hospital stays were compared. P values below 0.05 were considered significant in an independent T-test19.

RESULTS:

The age distribution of the two groups was analyzed in this Study. Of the patients in Group A, 9 (30%) were between 20 and 40, and 21 (70%) were between 41 and 65. With an SD ± 15.46, the mean age was 48 years. In contrast, 15 (50%) of the patients in Group B were between 20 and 40, and 15 (50%) were between 41 and 65. At 45 years old, the mean age was 17.04 SD. Table No. 1 The distribution of genders between the two groups was examined; in Group A, 23 patients (or 77%) were male, and seven patients (or 23%) were female. Conversely, in Group B, six patients (20%) werefemale, and 24 patients (80%) were male (table 2). The two groups' BMIs were compared; in Group A, five patients (17%) had BMIs ≤25 kg/m2, and 25 patients (83%) had BMIs >25 kg/m2. At 27 kg/m2, the mean BMI had an SD of 4.12. In contrast, group B included 18 patients (60%) with a BMI >25kg/m2 and 12 patients (40%) with a BMI ≤25 kg/m2. 26 kg/m^2 was the mean BMI, with an SD ± 3.57. (Table Number 3)Two groups' stone sizes were

compared; in Group A, 13 patients (43%) had stone sides that measured less than 5 cm, and 17 patients (57%) had stone sizes that measured more than 5 cm. With an SD ± 1.33, the average stone size was 5 cm. In contrast, 14 patients (47%) and 16 patients (53%) in Group B had stones larger than 5 cm. 5 cm was the averagestone size, with an SD of 2.01. (table no 4)In Group A, 20 patients (67%) had ≤3 stones, while ten patients (33%) had stones larger than 3 cm. The number of stones in the two groups was compared. Three stones were the mean, with an SD of 2.77. In contrast, nine patients (30%) and 21 patients (70%) in Group B had stones larger than 3 cm. With an SD ± 1.94, the mean number of stones was 2. (Table Number 5)The analysis focused on the mean operating time for the two groups. Group A had a mean surgical time of 35.06 minutes with SD ± 5 and a mean hospital stay of 2.6 days with SD ±0.9. In contrast, Group B saw an average surgical duration of 44.06 minutes (SD ± 7) and an average hospital stay of 3.4 days (SD ± 1.02). (Table Number 6)

Table no 1. Age distribution (n=60)

AGE	GROUP A	GROUP B
20-40 years	9(30%)	15(50%)
41-65 years	21(70%)	15(50%)
Total	30(100%)	30(100%)

Table 2: Gender Distribution (n=60)

Gender	Group A	Group B
Male	23 (77%)	24 (80%)
Female	7 (23%)	6 (20%)
Total	30 (100%)	30 (100%)

Table no3 . Number of stones (n=60)

mber ofstones	GROUP A	GROUP B
< 3 stones	20(67%)	21(70%)
>3 stones	10(33%)	9(30%)
Total	30(100%)	30(100%)

Table no 4 . Outcome(n=60)

MEAN AND SD	GROUP A (n=30)	ROUP B(n=30)	P value
erativetime	06 ±5	44.06 ± 7	0.0001
ospital stay	.6 ±0.9	3.4± 1.02	0.0021

Table no 5. Bmi (n=60)

BMI	GROUP A	GROUP B
< 25 Kg/m^2	5(17%)	12(40%)
>25 Kg/m^2	25(83%)	18(60%)
Total	30(100%)	30(100%)

TABLE NO 6. SIZE OF STONE (n=60)

Size of stone	GROUP A	GROUP B
< 5 cm	13(43%)	16(53%)
>5 cm	17(57%)	14(47%)
Total	30(100%)	30(100%)

Discussion:

Urinary bladder stones comprise 5% of cases of urolithiasis, with single calculi being identified in most instances butnumerous calculi in 25% of cases[20]. With the development of endourological fiberoptic equipment and extracorporeal shockwave lithotripsy (SWL), there have been notable modifications to managing and treating vescicolithiasis[21]. Large bladder stones are being removed using various methods, including open vescicolithotomy, percutaneous cystolitholapaxy (PCCL), transurethral cystolitholapaxy (TUCL), and SWL. Despite this, the conventional approach to treating bladder calculi is still debatable[22]. According to our analysis, nine patients (30%) in Group A were between 20 and40, and 21 patients (70%) were between 41 and 65. In contrast, 15 (50%) of the patients in Group B were between 20 and 40, and 15 (50%) were between 41 and 65. Seven patients (23%) and 23 patients (77%) were female in Group A. In contrast, six patients (20%) and 24 (80%) in Group B were female. Group A had an average surgical duration of 35.06 minutes (SD ± 5) and

an average hospital stay of 2.6 days (SD ± 0.9)[23], In contrast, the average operative duration for the transurethral lithotripsy group using high-energy laser lithotriptor technology was 37.19 minutes (SD ± 8.48) and mean hospital stay 1.2 days (SD ± 0.8 days). Comparing our findings to those of another Study by Bansal A.The transurethral removal group utilizing a rigid nephroscope had a mean surgical time of 33.6 minutes compared to 34.1 +/- 7 minutes from our report. et al. (2013), we found that In contrast, percutaneous cystolithotripsy (PCCL) group had a mean operative time of 47.8 + 17.6 minutes. et al[24]. (2013), the endoscope for transurethral operation and bladder neck incision were switched from a rigid endoscope to a flexible one. But in the same Study, the transurethral removal group utilizing a rigid nephroscope had a mean hospital stay of 1.3 days, whereas the PCCL group had an average time 2.12 weeks using high-energy laser dissolution and sheath-based fragmentation technique (figure 4).Comparing our findings to those of another Study by Gupta R et al. (2014), we found that The transurethral removal group utilizing a nephroscope had a mean surgical time of 32.7 + 8.7 minutes.Diaphragmatic respiration helps to lower the body temperature accordingly. In contrast, the minimum operative time in the PCCL group was 34.3 minutes. But in the same Study, the transurethral removal group utilizing a nephroscope had a mean hospital stay of only 1.2 days; PCCL group needs 2.1 + 0.4 days out there after surgery incumbent on room conditions.Seven at-home therapy payoffs are allocated to the first patients in each traditional medical procedure outpatient department after this survey begins[25]. The same procedure was done at home for thirty nine days on average with normal ecperimental material like Madecasi. In February of 2009, olanzapine and clozapine were used as intramuscular injection. As control group in the fast recovery ward at that time, we found among them: comparing our findings to those of another Study by Singh KJ et al. (2015), we found that the transurethral removal group utilizing a nephroscope had a mean surgical time of 32.1 + 8.5 minutes.In contrast, the percutaneous cystolithotripsy (PCCL) group had a mean operative time of 46.3 + 7.3 minutes[26]. The transurethral removal group utilizing a nephroscope had a mean hospital stay of 1.4 + 0.6 days in the same Study, while thePCCL group had an average of 2.1 + 0.15 days.

Conclusions:

Our study suggests that when dealing with large bladder calculi, transurethral removal with a nephroscope not only means less mean operating times per case but also shorter hospital stays.

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References:

1. Ziemba JB, Matlaga BR. Epidemiology and economics of nephrolithiasis. Inv Clin Urol 2017;58(5):299-306.

2. Halstead SB. Epidemiology of bladder stone of children: precipitating events. Urolithiasis. 2016;44(2):101-8.

3. Deswanto IA, Basukarno A, Birowo P, Rasyid N. Management of bladder stones: the move towards non- invasive treatment. Med J Indonesia. 2017;26(2):128-33

4. de Lorca AP, Serván PP, Rodriguez JR, Delgado CL, Fernández JL. Treatment of bladder lithiasis using a percutaneous approach in a patient with Mitrofanoff conduit. Cent Europ J Urol.;70(4):449-51.

5. Sigdel G S AA, Lamichhane N, Belokar W K. Transurethral use of nephroscope in managing bladder stone. J Col of Med Scien. 2013;9(1):14-8.

6. Bansal A, Kumar M, Sankhwar S, Goel S, Patodia M, Aeron R, Bhaskar V. Prospective randomized comparison of three endoscopic modalities used to treat bladder stones. Urolog J. 2016;83(2):87-92.

7. Yaklaşımın MT, Endoskopik K. Are the complication rates for the open approach in the surgical treatment of bladder stones higher than rates for endoscopic approaches? A comparative multivariate analysis study. J Urol Surg 2018;5(4):165-9.

8. Nameirakpam S, Naorem S, Faridi MS, Akoijam KS, Sinam RS. Transurethral cystolithotripsy of large bladder stones byholmium laser as a daycare procedure. J Clin Diag Res. 2016;10(12):PC01.

9. Singh KJ, Kaur J. Comparison of three different endoscopic techniques in management of bladder calculi. Indian Journal of Urology. 2011 Jan 1;27(1):10-3.

10. Papatsoris AG, Varkarakis I, Dellis A, Deliveliotis C. Bladder lithiasis: from open surgery to lithotripsy. Urological research. 2006 Jun;34:163-7.

11. Gupta R, Gupta S, Das RK, Basu S, Agrawal V. Comparative study of a new technique using nephroscope and resectoscope sheath and the percutaneous cystolithotripsy to treat bladder calculus. Cent Europ J Urol 2017;70(4):400-5.

12. Singh KJ, Kaur J. Comparison of three different endoscopictechniques in management of bladder calculi. Indian journal of urology: IJU: J Urol Soc India. 2011;27(1):10-15.

13. Bansal A, Kumar M, Sankhwar S, Goel S, Patodia M, Aeron R, Bhaskar V. Prospective randomized comparison of three endoscopic modalities used to treat bladder stones. Urolog J. 2016;83(2):87-92.

14. Gupta R, Gupta S, Das RK, Basu S, Agrawal V. Comparative study of a new technique using nephroscope and resectoscope sheath and the percutaneous cystolithotripsy to treat bladder calculus. Cent Europ J Urol 2017;70(4):400-5.

15. Singh KJ, Kaur J. Comparison of three different

endoscopictechniques in management of bladder calculi. Indian journal of urology: IJU: J Urol Soc India. 2011;27(1):10-15.

16. Hussain I, Qurashi MF, Kanjoo SR, Rashid A. Comparison of percutaneous cystolitholepexy with vesicolithotomy in paediatric age group for safety and efficacy. The Professional Medical Journal. 2020 Aug 10;27(08):1742-6.

17. Soliman NA, Rizvi SAH. Endemic bladder calculi in children. Pediatr Nephrol. 2017 Sep; 32(9):1489-1499.

18. Papatsoris AG, Varkarakis I, Dellis A, Deliveliotis C. Bladder lithiasis: From open surgery to lithotripsy.Urol Res 2006; 34(3):163-7.

19. Degnari RA, Jalbani MH, Abro MA. Transurethral cystolithotripsy for bladder calculi in children. Med Channel 2009; 5(4):110-113

20. Isen K, Em S, Kilic V, Utku V, Bogatekin S, Ergin H: Management of bladder stones with pneumatic with strips using a ureteroscope in children. J Endourol 2008; 22: 1037-40

21. Ali Sher Khosa, Muhammad Hussain, Manzoor Hussain. Safety and efficacy of transurethral pneumatic lithotripsy for bladder calculi in children. J Pak Med Assoc2012; 62(12)1297-300.

22. Nazar AM. Percutaneous use of stone punch in managing vesical calculi in children: A new treatment modality. GomalJ Med Sci 2006; 4:28-31.

23. Muhammad Akmal, Muhammad Irfan Munir. Percutaneous Cyst Lithotripsy: Is it Safe and Successful in all age groups? APMC; 2017: 11(1):25-27.

24. Suvo SM. Surgical Management of Extropy-Epispadias Complex: Early Results from a Tertiary Level Hospital in Bangladesh. iraetc med. bull; 1 (2)

25. 47-51. This work is licensed under a Creative Commons Attribution-NonCommercial. 2023;4.

26. Hammad FT, Kaya M, Kazim E. Bladder calculi: did the clinical picture change?. Urology. 2006 Jun 1;67(6):1154-8.