



ORIGINAL ARTICLE

## Feasibility and safety of pyeloplasty as day care surgery in pediatric patients: Initial experience.

Asif Khan<sup>1</sup>, Naqib Ullah<sup>2</sup>, Tauheed Fareed<sup>3</sup>, Nizam u Din<sup>4</sup>, Fahim Ullah<sup>5</sup>, Nazim Mohyudin<sup>6</sup>

**Article Citation:** Khan A, Naqib Ullah, Fareed T, Nizam u Din, Fahim Ullah, Mohyudin N. Feasibility and safety of pyeloplasty as day care surgery in pediatric patients: Initial experience. Professional Med J 2023; 30(01):96-101. <https://doi.org/10.29309/TPMJ/2023.30.01.7218>

**ABSTRACT... Objective:** To share experience feasibility and safety of pyeloplasty as day care procedure in pediatric patients. **Study Design:** Prospective Quasi Experimental study. **Setting:** Department of Urology, Saidu Teaching Hospital, Swat. **Period:** 1<sup>st</sup> July 2018 to 31<sup>st</sup> March 2020. **Material & Methods:** Pediatric patients presented with complaints of pelviureteric junction obstruction (PUJO) were carefully selected for day care pyeloplasty. They were electively admitted on the same day and operated in the morning hours and discharged after check by the operating surgeon if they fulfill criteria for day care surgery. **Results:** A total of 82 patients were planned for pyeloplasty 86.16% patients selected for day care surgery and discharged within 12 hours while 13% patients were admitted for 24 hour or more. Among day care patients 4.2% were readmitted for social reasons, 2.8 % patients had fever and admitted to in patient facility for intravenous antibiotics. 1.4% patients readmitted for gross hematuria and managed conservatively , 4.2% patient were complaining of pain and adjusted pain medication on outpatient basis and 4.2% patients had telephonic contact for stent symptoms and were reassured. **Conclusion:** Day care pyeloplasty is safe and cost effective procedure in careful selected pediatric patients who were complaining of symptoms due to PUJO.

**Key words:** Cost Effectiveness, Day Care Surgery, Pelviureteric Junction Obstruction, Pyeloplasty.

### INTRODUCTION

Pelviureteric junction obstruction (PUJO) is blockage of ureter at the junction with pelvis resulting in resistance to flow of urine from renal pelvis to ureter and in long term can impair kidney function if not corrected in time.<sup>1</sup> The childhood incidence of PUJO is estimated at 1 in 1000 individuals, male to female ratio is 2 to 1.<sup>2</sup> The gold standard procedure for management of PUJO is Anderson Hynes method of pyeloplasty.<sup>3</sup> This procedure can be done in either open, laparoscopic or robotic assisted with same results though till date open is considered to be much safer with upto 95% success rate.<sup>4</sup> In old days most of open surgeries were performed while patients have to be admitted for many days but nowadays the pattern has been quite changed due to development in day care surgeries in all surgical specialties.<sup>5</sup> With modification in the approach of treatment there has been a trend to

keep the patients for short time in hospital as it decreases hospital waiting list, decrease health care cost and increase hospital bed capacity while it is not compromising patient safety and satisfaction. Due to advancement in surgical techniques, small incision, muscle splitting technique, minimum external drains and better pre operative, intraoperative and post operative analgesia open pyeloplasty can be considered as day care surgery in highly selected pediatric patients. Cristian P Illie et al in there retrospective study which was conducted between March 2006 and January 2010 showed that day care laparoscopic pyeloplasty is safe and feasible procedure in properly selected pediatric patients. 78.12% patients were successfully discharged on Same day and 6.25% were readmitted after surgery. This is small retrospective study reporting there initial experience and have concluded that age is major factor for successful day care laparoscopic

1. MBBS, FCPS (Urology), Registrar Urology, Saidu Teaching Hospital, Swat.  
2. MBBS, FCPS (Urology), Senior Registrar Urology, Fatima Memorial Hospital, Shadman, Lahore.  
3. MBBS, FCPS (Urology), Assistant Professor Urology, Peshawar Institute of Medical Sciences Hayatabad, Peshawar.  
4. MBBS, FCPS (Urology), Assistant Professor Urology, Saidu Teaching Hospital, Swat.  
5. MBBS, FCPS (Urology), Consultant Professor Urology, DHQ Hospital, Landikotal Khyber Agency.  
6. MBBS, FCPS (Urology), Assistant Professor Urology, Rehman Medical Institute, Peshawar.

**Correspondence Address:**  
Dr. Naqib Ullah  
House 275, Street 19, Sector L3,  
Phase 3 Hayatabad, Peshawar.  
naqibullah009@yahoo.com

**Article received on:** 30/07/2022  
**Accepted for publication:** 10/10/2022

pyeloplasty.<sup>6</sup> As in literature the role of day care pyeloplasty is not properly studied but this study shows that in highly selected pediatric patients open pyeloplasty can be performed as day care surgery who have proper care taker at home and those whom can easily approach health care facility in case of any emergency. The purpose of the present study is to evaluate safety and cost effectiveness of day care open pyeloplasty in carefully selected pediatric patients, but as the study has not been randomized and sample size is small so it needs more randomization and large sample size.

## MATERIAL & METHODS

This is prospective quasi experimental study performed in tertiary care hospital urology department Saidu teaching hospital Swat after approval from institution ethical committee (23-400/2022) from 1<sup>st</sup> July 2018 to 31<sup>st</sup> March 2020. All pediatric patients presented with complaints of PUJO to OPD, workup done which includes pertinent history, general physical and relevant urological examination, base line investigations conducted which includes ultrasound kidney ureter and bladder, urine routine examination, complete blood count, renal function tests, and DTPA scan for PUJO confirmation and to define relative function of the kidney. All surgeries were performed by single experience urologist under general anesthesia using anterior approach with 5-6cm muscle splitting subcostal incision and in the end of surgery djs or nephrostomy tube were put in all patients.

Patients who were booked for day care pyeloplasty informed consent taken, explained details of day care procedure and inclusion criteria as well. Inclusion criteria include age greater than one year, single moiety pyeloplasty, no abberent or accessory renal vessels, smooth anesthesia induction and recovery, no injury to kidney and surrounding structures, responsible care taker at home and there should be no social constraints and duration of surgery less than 75 min. Exclusion criteria include age less than 1 year, injury to kidney parenchyma or pelvis, need of nephrostomy tube, hematuria post operatively, fever, late night surgery, surgery duration more

than 75 min and difficulty in anesthesia.

Postoperatively patients selected for day care surgery retained in day care area for 4—6 hours and patients encouraged to take fluid intake early. Postoperative analgesia started in preop ward as this has been shown by many studies that proper preoperative analgesia have detrimental effect on post operative pain of patients who had undergone any type of surgery. All patients who recovered smoothly with normal vital signs and taking feed well discharged home on oral antibiotics and analgesics after checking by the primary surgeon. Patients were advised to report to emergency department in case of fever and other symptoms. All patients were given phone number of doctor on duty and the operating surgeon to contact them in case of any emergency they come across. Routine follow up schedule for open pyeloplasty is 1<sup>st</sup> visit at 1 week for general check up and 2<sup>nd</sup> visit after 1 month postoperatively for djs removal. In this study we have analyzed rate of planned and unplanned readmission, complaints of day care patients, average cost difference between day care and inpatients and management of complications with which patients has readmitted.

## DATA ANALYSIS

Data analysis was performed with the program Statistical Package for Social Sciences (SPSS, Inc-, Chicago, Illinois, USA) version 18. Descriptive statistics of numerical variables such as age, mean operative time, readmission rate were computed with mean and standard deviation. Frequency and percentage of categorical variables such as reason of inpatient re admission and perioperative complications and its management were computed with chi-square test and Fisher's exact tests. Average cost of day care pyeloplasty was compared with inpatient pyeloplasty.

## RESULTS

This is prospective study in which 82 patients were included in the study, age ranges from 7 months to 16 years 56(71.7%) were male and 26(28.3%) female, 19 (60.8%) patients had right PUJO while 63(39.2%) had left sided PUJO. Procedure time ranges from 55 to 95 min (average 70min) as

shown in Table-I. Overall 86.58% (n=71) patients were discharged within 12 hours after applying the inclusion criteria made for day care pyeloplasty and 13.4% (n=11) patients were admitted for 24 hours or more. Among those patients who fulfilled criteria for day care surgery 4.2% (n=3) were readmitted for social reasons, 1.4% (n=1) patient had hematuria who were admitted and conservatively managed and 2.8% (n=2) patient had high grade fever and were treated with IV empirical antibiotics after admission as shown in Table-II. 4.2% (n=3) patient had complaint of pain at the wound site and were managed on out patients basis, and 4.2% (n=3) patients had telephonic contact for stent symptoms and were reassured as shown in table IV. Average cost difference between day care and inpatient is about Rs 20000 per 24 hours as shown in Table-III.

Variable	Value
Age	7 months to 16 years
Gender No (%)	
Male	56(68.29%)
Female	26(31.7%)
Laterality No (%)	
Right	19 (23.17%)
Left	63(76.82%)
Length of incision	5-6cm
Duration of surgery	70min ±20min

**Table-I. Demographics of patient in the study sample (n =82)**

Variable	No of Patients (%)
Planned readmission rate	
Patient preference	3(4.2%)
Unplanned readmission rate	
Fever	2(2.8%)
Hematuria	1(1.4%)

**Table-II. Reasons of planned and unplanned readmission rate in day care patients (n=82)**

Inpatient pyeloplasty package price per operation	Day care pyeloplasty package price per operation
Stay in ward per 24 hr 85,000 PKR	Day care 65,000 PKR
Stay in private room per 24 hr 105,000 PKR	Day care 65,000 PKR

**Table-III. Cost comparison of inpatient and day care pyeloplasty per 24 hour (n =82)**

S. No	Complaints	Management	No of Patients (%)
1	Socially patients not willing for day care surgery	Readmission	3(4.2%)
2	Pain	Pain medication adjusted	3(4.2%)
3	Fever	IV antibiotics	2 (2.8%)
4	DJS symptoms	Reassurance	3(4.2%)
5	Hematuria	Conservative	1(1.8%)

**Table-IV. Short term postoperative complications of pyeloplasty and its management in day care patients (n =82)**

**DISCUSSION**

Dilatation of upper urinary tract has been challenging since at times it become difficult to decide which patients should be monitored, whom should be treated medically with antibiotics and those considered for surgical intervention.<sup>7,8</sup> The widespread use of ultrasonography in antenatal period has resulted in higher detection rate of fetal hydronephrosis while most sensitive for antenatal ultrasound is 28<sup>th</sup> week of pregnancy so dilatation during this period should be taken seriously and always focused on laterality and degree of dilatation, gender of child, volume of amniotic fluid and bladder volume.<sup>9,10</sup> It is important to understand that management of PUJO depend upon serial ultrasound studies, symptoms of patients i.e pain, recurrent infection of urinary tract and decrease in renal function which is absolute indication for pyeloplasty.<sup>11,12</sup> Pyeloplasty can be performed in open, laparoscopic, or robotic assisted depend upon experience and availability of instruments.<sup>13,14</sup> While these approaches has same results in term of free drainage post operatively if confirmed by renal scanning.<sup>15</sup> In underdeveloped countries like Pakistan the laparoscopic pyeloplasty is not well established so majority of center Anderson Hynes pyeloplasty in open method.<sup>16</sup>

Many pediatric urological surgeries like ureterorenoscopy, bladder stone, posterior urethral valves ablation, herniotomy, meatoplasty and mini pcnl since many years are performing as day care surgeries.<sup>17</sup> Open pyeloplasty can be performed as day care surgery in highly selected

patient after fulfilling the inclusion criteria for day care surgery.<sup>18</sup> Due to advancement in analgesia protocol in such way that many centers start analgesics in preoperative ward which has very good analgesic effect in post operative period and over all smooth recovery and early mobilization of patients.<sup>19</sup> Nowadays many hospitals has changed there inpatients criteria and admit those patients who have complicated surgery which poses risk to life of patients, majority of urological surgeries both pediatric and adult can be performed as day care and patient symptoms can be managed in home without need for admission. Day care surgery is defined as procedure performed and patient discharge in the same day of admission.<sup>20</sup> Day surgery audit commission 2001 report has suggested that increase use of day care surgery decreases hospital waiting list, decrease health budget and most importantly it does not compromise patient safety and satisfaction. Due to long waiting list for surgery, over burden inpatient facility and increase allocation of health budget doctors are thinking of modifying the procedure in such a way to minimize patient morbidity, early return to work and shorten hospital stay in this regard many open, laparoscopic and endoscopic surgeries have been performed as day care procedures since many years.<sup>21</sup>

In this study 82 patients were booked for open pyeloplasty and 86% fulfilled inclusion criteria and were discharged on the same day after re examined by the operated surgeon.13% didn't meet the inclusion criteria and were admitted for 24 hour or more and were given all in patients facilities. In day cases patients 3 patients didn't want to be discharged though they have fulfilled the inclusion criteria so they were kept in ward for 24 hour. Three patients had contacted through phone for pain symptoms so their pain medications were adjusted on outpatient basis. One patient had gross hematuria for that we readmitted him and treated conservatively without need for blood transfusion. Two patients had high grade fever so admitted to in patient facility for IV antibiotics and critical care if needed, they responded well to empirical antibiotics and discharged in next 24 hours.

Amos Neheman et al in their study total 135 pediatric patients underwent robotic procedures in an outpatient setting. 62 patients had underwent pyeloplasty and 55 ureteric reimplantation. 10 patients ureteroureterostomy and 8 patients underwent extirpative procedures (nephrectomy and hemi nephrectomy). During the 30 day follow up 6.7% patients had complications and among them 0.7% had Clavindo Dindo 3 complication severity. There were 9 (6.7%) who visited emergency room and 5 cases needed readmission. They have concluded that robotic assisted reconstructive pediatric urology surgeries can be performed on outpatient basis obviating the need for in patient care.<sup>22</sup> J B Marotte et al in their study had shown that extravesical ureteric reimplantation can be done safely on outpatient basis. During 16 months period 2 male child and 42 female child underwent ureteric reimplantation by same urologist with good experience in pediatric reconstructive procedures. 31 patients were discharged on same day of surgery while 13 remain admitted and discharged on next day of surgery. Pain management and catheter placement significantly influence length of stay in hospital.<sup>23</sup>

## CONCLUSION






This study concludes that day care open pyeloplasty is safe, cost effective and feasible procedure in carefully selected pediatric patients.  
**Copyright© 10 Oct, 2022.**

## REFERENCES

1. Adey GS, Vargas SO, Retik AB, Borer JG, Mandell J, Hendren WH, Lebowitz RL, Bauer SB. **Fibroepithelial polyps causing ureteropelvic junction obstruction in children.** The Journal of urology. 2003 May; 169(5):1834-6.
2. Snyder III HM, Lebowitz RL, Colodny AH, Bauer SB, Retik AB. **Ureteropelvic junction obstruction in children.** Urologic Clinics of North America. 1980 Jun 1; 7(2):273-90.
3. Kelalis PP, Culp OS, Stickler GB, Burke EC. **Ureteropelvic obstruction in children: Experiences with 109 cases.** The Journal of Urology. 1971 Sep; 106(3):418-22.

4. Gopal M, Peycelon M, Caldamone A, Chrzan R, El-Ghoneimi A, Olsen H, Leclair MD, Stillebroer A, MacDonald C, Tonnhofner U, Strasser C. **Management of ureteropelvic junction obstruction in children—a roundtable discussion.** *Journal of Pediatric Urology.* 2019 Aug 1; 15(4):322-9.
5. Ahn JJ, Ellison JS, Merguerian PA. **A Societies for Pediatric Urology survey of opioid prescribing practices after ambulatory pediatric urology procedures.** *Journal of Pediatric Urology.* 2019 Oct 1; 15(5):451-6.
6. Ilie CP, Luscombe CJ, Smith I, Boddy J, Mischianu D, Golash A. **Routine day-case laparoscopic pyeloplasty: A paradigm shift?** *Journal of endourology.* 2011 May 1; 25(5):797-801.
7. Williams B, Tareen B, Resnick MI. **Pathophysiology and treatment of ureteropelvic junction obstruction.** *Current urology reports.* 2007 Mar; 8(2):111-7.
8. Tan BJ, Rastinehad AR, Marcovich R, Smith AD, Lee BR. **Trends in ureteropelvic junction obstruction management among urologists in the United States.** *Urology.* 2005 Feb 1; 65(2):260-4.
9. Capello SA, Kogan BA, Giorgi LJ, Kaufman RP. **Prenatal ultrasound has led to earlier detection and repair of ureteropelvic junction obstruction.** *The Journal of urology.* 2005 Oct; 174(4 Part 1):1425-8.
10. Chertin B, Fridmans A, Knizhnik M, Hadas-Shalperin I, Hain D, Farkas A. **Does early detection of ureteropelvic junction obstruction improve surgical outcome in terms of renal function?** *The Journal of urology.* 1999 Sep; 162(3 Part 2):1037-40.
11. Cain MP, Rink RC, Thomas AC, Austin PF, Kaefer M, Casale AJ. **Symptomatic ureteropelvic junction obstruction in children in the era of prenatal sonography—is there a higher incidence of crossing vessels?** *Urology.* 2001 Feb 1; 57(2):338-41.
12. Cain MP, Rink RC, Thomas AC, Austin PF, Kaefer M, Casale AJ. **Symptomatic ureteropelvic junction obstruction in children in the era of prenatal sonography—is there a higher incidence of crossing vessels?** *Urology.* 2001 Feb 1; 57(2):338-41.
13. Bove P, Ong AM, Rha KH, Pinto P, Jarrett TW, Kavoussi LR. **Laparoscopic management of ureteropelvic junction obstruction in patients with upper urinary tract anomalies.** *The Journal of urology.* 2004 Jan; 171(1):77-9.
14. Gallo F, Schenone M, Giberti C. **Ureteropelvic junction obstruction: which is the best treatment today?** *Journal of Laparoendoscopic & advanced surgical techniques.* 2009 Oct 1; 19(5):657-62.
15. Nakada SY, McDougall EM, Clayman RV. **Laparoscopic pyeloplasty for secondary ureteropelvic junction obstruction: preliminary experience.** *Urology.* 1995 Aug 1; 46(2):257-60.
16. Mei H, Pu J, Yang C, Zhang H, Zheng L, Tong Q. **Laparoscopic versus open pyeloplasty for ureteropelvic junction obstruction in children: A systematic review and meta-analysis.** *Journal of endourology.* 2011 May 1; 25(5):727-36.
17. Muhammad AS, Abdullahi AA, Agwu NP, Mungadi IA. **Urologic day-care surgery in a tertiary hospital in Nigeria: A 4-year review.** *Sahel Medical Journal.* 2019 Oct 1; 22(4):214.
18. Piedrahita YK, Palmer JS. **Is one-day hospitalization after open pyeloplasty possible and safe?** *Urology.* 2006 Jan 1; 67(1):181-4.
19. Casella DP, Fox JA, Schneck FX, Cannon GM, Ost MC. **Cost analysis of pediatric robot-assisted and laparoscopic pyeloplasty.** *The Journal of urology.* 2013 Mar 1; 189(3):1083-6.
20. Osborne GA, Rudkin GE. **Outcome after day-care surgery in a major teaching hospital.** *Anaesthesia and intensive care.* 1993 Dec; 21(6):822-7.
21. Bain J, Kelly H, Snadden D, Staines H. **Day surgery in Scotland: patient satisfaction and outcomes.** *BMJ Quality & Safety.* 1999 Jun 1; 8(2):86-91.
22. Neheman A, Kord E, VanderBrink BA, Minevich EA, Noh PH. **Outpatient robotic surgery in pediatric urology: Assessment of feasibility and short-term safety.** *The Journal of Urology.* 2022 Apr; 207(4):894-900.
23. MAROTTE JB, SMITH DP. **Extravesical ureteral reimplantations for the correction of primary reflux can be done as outpatient procedures.** *The Journal of urology.* 2001 Jun; 165(6 Part 2):2228-31.

### AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Asif Khan	Supervision of study and Literature review.	
2	Naqib Ullah	Manuscript drafting, Data compilation and analysis.	
3	Tauheed Fareed	Data analysis and manuscript writing.	
4	Nizam u Din	Final critical review of the manuscript and literature reiev.	
5	Fahim Ullah	Data analysis and references.	
6	Nazim Mohyudin	Manuscript writing and Literature review.	