



ORIGINAL ARTICLE

Dorsal lumbotomy approach for paediatric pyeloplasty.

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ABSTRACT... Objective: To assess the outcomes of dorsal lumbotomy approach for paediatric pyeloplasty in terms of duration of surgery, blood loss, hospital stay and postoperative complications. **Study Design:** Retrospective Review. **Setting:** Children Hospital, Faisalabad. **Period:** Aug 2021 to July 2024. **Methods:** The patients presented with hydronephrosis and followed by confirmed case of pelviureteric junction obstruction with DTPA renal scan, were operated in last five years with this surgical approach were reviewed retrospectively, n=126 cases. Pelviureteric junction was corrected with dismembered pyeloplasty using dorsal incision vertically named dorsal lumbotomy incision. DJ stent was placed in every case of pyeloplasty which was removed cystoscopically after 6 weeks of procedure. **Results:** There was total 126 patients, 82 patients were males and 44 patients were females. The mean age of patients at the time of surgery was 4.56 ± 2.16 years. Mean duration of surgery was 52.60 ± 8.27 minutes. Mean blood loss was 42.7 milliliters. Mean hospital stay was 3.46 ± 1.38 days. Superficial wound infection was documented in 13 (10.3%) patients, spontaneous expulsion of DJ stent through urethra in 3 (2.4%) patients, ureterovascular junction obstruction (UVJO) was found in 6 (4.8%), incisional hernias were documented only in only 3(2.4%) patients. Cosmetic acceptance by the patients/parents of this incision was documented in 119 (94.4%) cases. After 24-month follow-up there was observed evidence of clinical and radiological improvement in 120(95.2%) patients. **Conclusion:** Dorsal lumbotomy approach for pediatric pyeloplasty is a safe technique for boys and girls. Post-operative morbidity, wound infection and seroma formation all are low in dorsal lumbotomy approach.

Key words: Hydronephrosis, Lumbotomy, Pyeloplasty, Pelviureteric Junction Obstruction.

INTRODUCTION

The obstruction of pelviureteric junction is most common congenital renal anomaly identified with hydronephrosis. If this disease is left untreated we can lose the kidney, because obstruction can lead to damage of the nephron irreversibly.^{1,2}

The procedure pyeloplasty is being performed via multiple incision approaches like anteriorly subcostal incision or lateral known as flank incision and posterior vertical known as dorsal lumbotomy incision approach.^{2,3} Urologist performing pyeloplasty can easily and swiftly approach the kidney, pelvis and upper ureter using incision posteriorly known as dorsal lumbotomy.⁴ One more edge of this incision is that we only split the muscles instead of resecting the muscles, which lowers the discomfort and decreases analgesia requirement. Wound healing and infections

results are satisfactory, well positioned scar leads to early recovery, shorter hospital stay and cosmetically acceptable scar mark.^{5,6} We have performed pyeloplasty in paediatric patients with dorsal lumbotomy incision. Using the data, we conducted the study to see pros and cons of this incision approach. In this study we evaluated and summarize the clinical outcomes of an incision approach named as dorsal lumbotomy for pyeloplasty patients who underwent surgery of pelvi-ureteric junction obstruction (PUJO).

METHODS

We got approval of research from the ethical review committee (Ethical Letter Ref No. 1168/CHF Dated: 27-08-2024) of the children hospital Faisalabad, then the data of the research was taken from the department of paediatric urology children hospital Faisalabad.

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The patients were admitted in the department of Paediatric urology via the outdoor of the Children Hospital Faisalabad with diagnosis of Pelviureteric junction obstruction (PUJO), where after taking the disease history, physical examination, Ultrasound and were confirmed with radioisotope renal scan named Diethyl Tri-amino Penta acetic Acid (DTPA) renal scan. Informed consents of procedure and data for research were already taken from all the patients/ Guardians. There were 126 patients having hydronephrosis due to PUJO, who were enrolled in the research. These all 126 patients were proceeded pyeloplasty with technique named Anderson Hynes dismembered pyeloplasty with incision named dorsal lumbotomy. Inclusion criteria of the research work was following i. patients underwent pyeloplasty with symptoms of pain, ii. recurrent infection, iii. palpable kidney in the lumber region, iv. the asymptomatic patients whose kidney function was affected i.e. differential function of kidney found less than 30% to 40% on (DTPA Renal scan), v. those cases where we found an obstructive curve in radioisotope renal scan, vi. patients were failed with non-operative management plan, vii. meaning the renal function on DTPA renal scan was compromised, viii. on ultrasonography an increased pelvicalyceal dilatation by measuring antero-posterior diameter (APD) of renal pelvis measured more than 30 mm, ix. The patients who hadn't any symptom but having the obstruction with no evidence of resolution of obstruction on ultrasonography and radioisotope renal scan. Exclusion criteria of the study was anomalous kidneys i.e. mal-rotated kidney, horseshoe kidney etc.

Methodology

According to inclusion and exclusion criteria patients with confirmed diagnosis of PUJO were performed pyeloplasty with dorsal lumbotomy incision. All the patients were performed under general anaesthesia. Pyeloplasty was performed in prone position, incision was made vertically in the lumber area, The incision was made below and 1cm medial of tip of the 12th rib (Figure-1), along the lateral border of the erector spinae muscle, and then it was extended downwards till one to two finger breadth above the pelvic

bone, then incision angulated laterally as shown in image (Figure-1). The fascia named as Scarpa was opened up with vertical incision, then incision was performed through the posterior lamella of lumbodorsal fascia.

After the elevation of lateral edge of it, the sacrospinalis muscle was retracted towards medial side. To secure the iliohypogastric nerve the lumbodorsal fascia was opened up by a vertical incision through the middle and anterior lamella. By retraction the muscle quadrates lumborum, paranephric fat and Gerota's fascia was opened up. Now the kidney, pelvis and ureter were exposed. We used four stay stitches in the pelvis, two medial to pelviureteric junction and two lateral to pelviureteric junction shown in (Figure-2). Level of pelviureteric junction obstruction (PUJO) was confirmed and incision made with the help of tenotomy scissor between pelviureteric obstruction and medial stay suture (Figure-3). The redundant and extra renal pelvis was excised along with pathology site of PUJO. Pelvi-ureteric anastomosis with continuous suture technique with 4/0 Polyglactin (Vicryl) was performed and DJ stent was placed in renal system. Nelaton drain no 14 was placed. The wound was closed in layers in reverse order. All procedures were done by same surgical team.

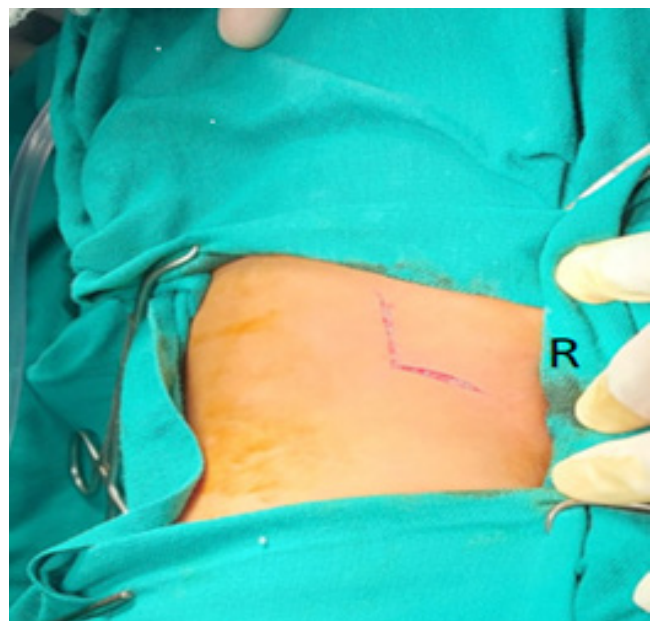


Figure-1. Operative pictures of dorsal lumbotomy incision



Figure-2. Stay suture on renal pelvis



Figure-3. Incision on the pelvis

Duration of surgery was documented from incision to stiches. Blood loss was measured by Gauze pieces by counting number of gauze pieces used. Gauze pieces were weighed before and after use to estimate the blood loss. The difference in weight was assumed to be the amount of blood absorbed by the gauze. Wound infection was assessed clinically on daily basis for presence of redness, swelling, warmth or Pus or discharge. Postoperative analgesia paracetamol was used

initially through intravenous route then oral route. Postoperative oral free time was noted according to bowel movement, hospital stay and cosmetic acceptance was documented. All the patients were uneventful. The DJ stent was removed after 6 weeks of surgery as per our protocol.

RESULTS

There was total 126 patients, 82 patients were males and 44 patients were females described in Figure-1. The mean age of patients at the time of surgery was 4.56 ± 2.16 years (range from 1.5 months to 12 years). Patients presented with complaint of a lump which was painless, having recurrent urinary tract infection (UTIs) and pain in the renal area. The demographic features of patients are given in Table-I.

	Symptoms	N	Percent-age
Gender	Boys	82	65.1
	Girls	44	34.9
Age (Mean±)		4.56	2.16
Symptoms	Painless lump	60	47.6 %
	Recurrent UTI	17	13.49 %
	Flank pain and lump	29	23.01 %
	Prenatal detection	14	11.11 %
	Incidentally found on ultrasound	6	4.76 %

Table-I. Demographic and clinical presentation of PUJO (n=126).

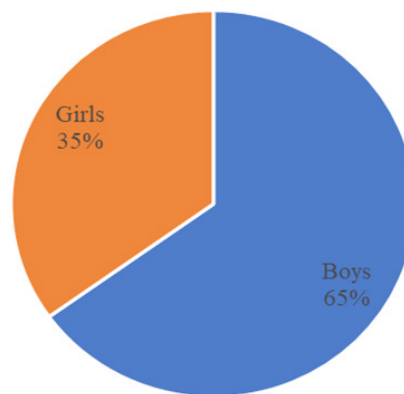
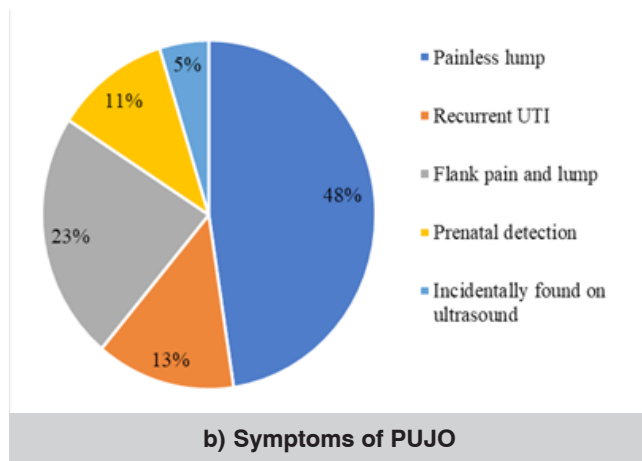


Figure-A: Gender of Children



Mean duration of surgery was 52.60 ± 8.27 minutes (ranged 45 to 95 minutes). Independent sample t test was applied to compare mean duration of surgery in boys and girl (52.30 ± 7.47 and 53.14 ± 9.66 minutes respectively (p 0.539). Mean blood loss was 42.7 milliliters (range 5 ml to 60 ml) per-operatively (42.68 ± 8.84 in boys and 42.73 ± 7.95 ml in girls) without significant difference (p 0.978). Mean hospital stay was 3.46 ± 1.38 days (3.28 ± 1.09 in boys and 3.80 ± 1.79 ml in girls) and there was a significant difference among boys and girls (p 0.048). Superficial wound infection was documented in 13 (10.3%) patients which was cured by antiseptic dressing and antibiotics therapy. No gender wise difference was noted in for wound infection in boys and girls.

Variable	Boys	Girls	P-Value
	Mean	Mean	
Operative Time	52.30 ± 7.47	53.14 ± 9.66	0.539
Blood loss	42.68 ± 8.84	42.73 ± 7.95	0.978
Hospital Stay	3.28 ± 1.09	3.80 ± 1.79	0.048
Wound Infection	$8 \pm 9.8\%$	$5 \pm 11.4\%$	0.500

Table-II. Gender-wise comparison of duration of surgery, blood loss and hospital stay

Superficial wound infection was documented in 13 (10.3%) patients which was cured by antiseptic dressing and antibiotics therapy. No gender wise difference was noted in for wound infection in boys and girls. We found spontaneous expulsion of DJ stent through urethra in 3 (2.4%) patients postoperatively which was corrected immediately. Associated ureterovascular junction obstruction (UVJO) was found in 6 (4.8%) patients, which

was corrected three months later. The UVJO was confirmed by postoperative antegrade pyelogram. Anastamotic stenosis postoperatively found in four patients because they had recurrent and increased hydronephrosis followed by redo surgery. Incisional hernias were documented only in only 3(2.4%) patients. Cosmetic acceptance by the patients/parents of this incision was documented in 119 (94.4%) cases. After 24-month follow-up there was observed evidence of clinical and radiological improvement in 120(95.2%) patients.

Variable	Boys	Girls	P-Value
	N	N	
Expulsion of DJ	2 (2.4%)	1 (2.3%)	0.721
Wound Infection	8 (9.8%)	5 (11.4%)	0.500
UVJO	3 (3.7%)	3 (6.8%)	0.349
Cosmetic acceptance	80 (97.6%)	41 (93.2%)	0.230
Incisional hernias	2 (2.4%)	1 (2.3%)	0.721
Improvement	2 (2.4%)	4 (9.1%)	0.095

Table-III. Gender-wise comparison of post-operative complication

DISCUSSION

Dorsal lumbotomy is not a new technique incision, it is an ancient time incision, firstly described in 1870 by Simon. To perform renal surgeries, this incision is good for infants but it can also be used in all age groups of paediatric population even in teens.^{5,7} Two types of posterior lumbotomy incisions are well established in the literature; where first is transverse and second is vertical dorsal lumbotomy incision. Panach-Navarrete and colleagues prefer transverse dorsal lumbotomy incision for the cosmetic reasoning.⁸

In our study, we have used the vertical incision for pelvi-ureteric junction obstruction. The surgeons using vertical dorsal lumbotomy have benefit of better manage the long adynamic segment of ureter easily.⁷ Varela et al. also prefer the vertical incision in lumbotomy incision for pyeloplasty in their study, they studied it for ten years and compare it with robotic surgery.⁸ There was total 126 patients, 82 patients were males and 44 patients were females described. The mean age of patients at the time of surgery was 4.56 ± 2.16 years (range from 1.5 months to 12 years). Clinical

presentation was painless lump in 60(47.6 %), recurrent UTI in 17(13.49 %), flank pain and lump in 29(23.01 %), prenatal detection in 14(11.11 %) and incidentally found on ultrasound 6(4.76 %) children. These demographic and clinical features are in accordance with other studies.⁹ In a study the median age at the time of surgery was 7.7 years (range 1.5-16 years). There were 50 boys and 19 girls (male/female ratio 2.5:1).¹⁰ In a study out of 84 patients, 61 patients were males and 23 patients were females. The mean age at the time of operation was 43 months (range 2 months to 11 years)¹¹. Mean duration of surgery was 52.60±8.27 minutes, mean blood loss was 42.7 ml and mean hospital stay was 3.46±1.38 days. Average operative time was 99 minutes in a study by Shahaji S. Deshmukh et al.¹¹ Stay in the hospital among dorsal lumbotomy incision was decreased, and daily narcotic requirement calculated in oral morphine was equivalent.¹²

Braga et al. has conducted a comparative study among three incisions first the flank incision, secondly laparoscopic and third one is dorsal lumbotomy approach in children. He performed dismembered pyeloplasty using these three approaches. In his study overall complications rate is equivocal in all three approaches, none of the each is preferable to each other.¹³

We found positive feedback in the data of recent researches of dorsal lumbotomy incision approach. We found in the literature a list of advantages of dorsal lumbotomy approach are: minimal post-operative pain with minimal analgesia requirement, less discomfort, swift and easy access to the procedure site, early mobilization, short duration hospital stay and low chances of incisional hernia formation, while it is written in the literature that the posterior lumbotomy incision approach should be avoided in the cases like pyeloplasty in hydronephrosis plus malrotated kidney or ectopic kidney and this incision is also not suitable for redo surgery of pyeloplasty.¹¹ In older children there are limited exposure due to developed musculature, so the extension of wound is necessary in some cases of older age group if required. There are controversies with the incision when there is

dual pathology like PUJ obstruction associated with VUJ obstruction, in such cases of dual pathologies there are difficulties to diagnose the primary pathology leading to the associated second pathology.¹⁴

Choo et al. used this incision for pyeloplasty with mean age of surgery 3.5 years and procedure time was 52.6 minutes, which is comparable with minimal invasive surgery like laparoscopy. Proper preoperative assessment and diagnosis, fully exposure during surgery, obstructive segment length, renal function and associated distal obstruction at VUJ determine the successful outcome.¹⁵

Bajpai et al. declare in his study that out of thirty-six cases of surgery with this approach one case showed some deterioration in renal profile, which shows great success of this incision approach. Three years follow up of Eighty-two patients were found the improvement in renal function, deliberate the success of surgery.¹⁷ Onol et al. found no recurrent obstruction at PUJ after a follow up of 56 months.¹⁸ Boubaker et al. confirmed in his study that there are not any recurrent obstruction confirmed with radioisotope scan, and concluded that longer follow up is not necessary.¹⁹ In future larger patient pool can be assessed for outcome of this approach in this particular case to further strengthen the results.

CONCLUSION

Dorsal lumbotomy approach for pediatric pyeloplasty is a safe technique for boys and girls. Post-operative morbidity, wound infection and seroma formation all are low in dorsal lumbotomy approach.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

SOURCE OF FUNDING




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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Imran Qadir	Protocol / Project conception and design.	
2	Sadaqat Ali	Data acquisition.	
3	Samreen Jamil	Manuscript writing and proof reading.	
4	Haji Muhammad	Analysis and data interpretation.	