RESEARCH PAPER

Stented versus Non-Stented Dismembered Pyeloplasty for Ureteropelvic Junction Obstruction in Children: A Randomized Comparative Study

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ABSTRACT

Objective: To compare dismembered (Anderson-Hynes) pyeloplasty performed with an indwelling ureteral stent against pyeloplasty performed without a stent in children with ureteropelvic junction (UPJ) obstruction.

Study Design: Randomized Controlled Trial.

Place and Duration of Study: This randomized controlled trial was conducted in the Department of Paediatric Surgery/Urology of SICHN -Sindh Institute of Child Health and Neonatology Sukkur over an eighteen-month period from 1st November 2024 up to 30th April 2026.

Methodology: A total of 80 children with unilateral primary UPJ obstruction were enrolled and randomly allocated into two equally sized arms of 40 patients each: Group A received an intraoperatively placed double-J, while Group B was managed without any stent, relying instead on a perinephric/peri-anastomotic drain alone. The two arms were compared for hospital stay, operative time, postoperative pain, urinary leak, urinary tract infection, complication rate, and surgical success.

Results: Mean age was 3.5±2.5 years in Group A and 3.7±2.7 years in Group B (p=0.73), with similar gender. Operative time was 133.1±19.0 minutes in the stented group and 109.5±16.8 minutes in the non-stented group (p<0.001), whereas hospital stay was shorter with stenting (3.9±1.3 versus 5.7±1.9 days, p<0.001). Urinary leak occurred in 2.5% of stented patients compared with 4/40 (10.0%) of non-stented patients, a difference that did not reach statistical significance in this smaller cohort (p=0.36). Surgical success did not differ significantly between arms, 92.5% in Group A and 90.0% in Group B (p=0.99), nor did the reintervention rate 5.0% versus 7.5%, (p=0.99).

Conclusion: Ureteral stenting does not alter the ultimate surgical success of dismembered pyeloplasty in children with UPJ obstruction, and it continues to shorten hospital stay and lengthen the operation.

Keywords: Anderson-Hynes pyeloplasty, ureteral stent, ureteropelvic junction obstruction, hydronephrosis, paediatric.

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INTRODUCTION

Among congenital anomalies of the urinary tract detected in childhood, narrowing at the ureteropelvic junction stands out as the single most frequent cause of a dilated collecting system, encountered in roughly one of every 1,000 to 1,500 newborns[1,2] and standing as the leading reason children require reconstructive surgery on the upper urinary tract. The defect reflects either a segment of ureter at the junction that fails to conduct peristaltic waves or narrowing produced by an aberrant vessel crossing the lower pole from outside, and it is now identified overwhelmingly before birth through routine fetal ultrasonography[3], a pattern of early detection that has redirected clinical attention away from treating symptomatic children and toward monitoring asymptomatic ones closely enough to intervene before lasting renal injury sets in.

A critical, yet still debated, aspect of this procedure is the method of urinary drainage during the postoperative

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healing period[4]. Traditionally, surgeons have employed an internal double-J (DJ) stent or an externalized nephrostomy/pyeloureteral stent to maintain ureteral patency, prevent anastomotic leakage, and reduce the risk of stricture formation while the anastomosis heals[5]. However, stent placement is not without drawbacks; it may necessitate an additional anesthetic procedure for removal, and is associated with complications such as infection, stent migration, and irritative bladder or flank symptoms, particularly in young children who may have limited tolerance for indwelling foreign bodies[6,7].

In response to these concerns, non-stented pyeloplasty performed with or without a temporary externalized drain has been proposed as an alternative, aiming to reduce stent-related morbidity, shorten hospital stay, and avoid a secondary procedure for stent removal[8]. Proponents argue that a meticulously performed, watertight anastomosis can heal reliably without the need for internal drainage, while critics caution that omitting a stent may increase the risk of urinary leakage, prolonged drain output, and anastomotic stricture, especially in technically demanding cases such as laparoscopic or robotic pyeloplasty in small infants[9,10]

Given these competing considerations, there remains no universal consensus on the optimal drainage strategy for pediatric dismembered pyeloplasty. This study aims to compare the outcomes of stented versus non-stented dismembered pyeloplasty in children with UPJO, with particular attention to operative time, postoperative complications, hospital stay, and long-term surgical success, in order to guide evidence-based surgical decision-making.

METHODS

This randomized controlled trial was conducted in the Department of Paediatric Surgery and Urology of SICHN - Sindh Institute of Child Health and Neonatology Sukkur over an eighteen-month period from 1st November 2024 upto 30th April 2026. Study was started following approval by the Institutional Ethics Review Committee. Before enrolment consent was obtained from the parent or legal guardian of every child. Eligible children were identified by consecutive, non-probability sampling and then allocated to Group A (stented) or Group B (non-stented) using lottery method. The sample size was calculated by comparing two independent proportions, using previously reported complication rates of 22.8% for non-stented and 14.2%[11] for stented dismembered pyeloplasty, at a 95% confidence level and 80% power. This calculation indicated a minimum requirement of 80 children, 40 per arm.

Diagnosis of primary unilateral UPJ obstruction (defined as grade III or IV hydronephrosis with an obstructive drainage pattern on diuretic renography) was confirmed and the child was scheduled for elective dismembered pyeloplasty only. Children were excluded if the obstruction was secondary (after previous pyeloplasty or other renal surgery), if the disease was bilateral or if there was associated vesicoureteral reflux, horseshoe or ectopic kidney, urolithiasis or an active UTI at the time of surgery or differential function of the affected kidney < 10%.

The same set of paediatric surgical consultants carried out all operations either open or laparoscopically via a transperitoneal approach. Both of these approaches were used depending on surgeon preference and institutional habits and were fairly balanced between the two study groups. When the incision was closed in Group A patients a stent, either double-J or one that crossed the anastomosis, was inserted at the proximal end of the repaired join. The stent was left in place for 4 to 6 weeks, which was then removed under anaesthetic using cystoscopy. No stenting (internal or external) was performed in patients in Group B. Instead, only a drain placed close to the anastomosis or kidney would be used for drainage and was left in until it was no longer necessary.

The indications for removal of the perinephric drain were the same and based on the standard clinical indications, in both groups. The most important criterion for evaluating the surgical success was the diuretic renography performed one year after surgery, for complete resolution or significant reduction in hydronephrosis. Further outcomes recorded were the duration of surgery, the number of hospital days following surgery, VAS score at 24 hours, success of surgery and if any complications occurred.

SPSS (version 26.0) was used for data analysis. Continuous variables age, operative time, hospital stay and pain score are presented as mean ± standard deviation and were compared using the independent-samples t-test. Categorical variables sex, complications, success and reintervention were presented as frequencies and percentages and compared using the Chi-square test. P values < 0.05 were considered statistically significant.

RESULTS

The two groups were closely matched at baseline. Mean age was 3.5 ± 2.5 years in Group A and 3.7 ± 2.7 years in Group B (p=0.73). Boys made up a comparable majority of each arm (25/40, 62.5% in Group A vs 24/40, 60.0% in Group B; p=0.99), and left-sided obstruction predominated similarly in both (22/40, 55.0% vs 21/40, 52.5%; p=0.99). Preoperative hydronephrosis severity was evenly distributed: SFU grade III accounted for 17/40 (42.5%) of Group A and 18/40 (45.0%) of Group B, while grade IV accounted for 23/40 (57.5%) and 22/40 (55.0%) respectively (p=0.99 for both). A laparoscopic transperitoneal approach was used in a similar minority of each arm, 14/40 (35.0%) in Group A and 13/40 (32.5%) in Group B (p=0.99), confirming that surgical approach was not a source of imbalance between groups. Table-1

Mean operative time was significantly longer with stenting 133.1 ± 19.0 minutes in Group A against 109.5 ± 16.8 minutes in Group B (p<0.001), a difference of roughly 24 minutes attributable to the additional steps of stent negotiation, positioning and confirmation. Postoperative hospital stay showed the opposite pattern, at 3.9 ± 1.3 days in the stented arm compared with 5.7 ± 1.9 days in Group

B (p<0.001). Postoperative pain at 24 hours, scored on the VAS, was higher in Group A (4.3 ± 1.2) than in Group B (3.2 ± 1.0, p<0.001).

Urinary leakage was numerically less frequent after stenting, occurring in 1/40 (2.5%) of Group A compared with 4/40 (10.0%) of Group B, a four-fold difference in leak risk that did not reach statistical significance in this smaller cohort (p=0.36). Urinary tract infection showed the reverse pattern, affecting 5/40 (12.5%) of stented children against 2/40 (5.0%) of non-stented children, again without formal significance (p=0.43). When all Clavien-Dindo-graded complications were pooled, the overall rate did not differ between arms, 7/40 (17.5%) in Group A versus 8/40 (20.0%) in Group B (p=0.99), indicating that the modestly higher infection burden in the stented group was offset by its lower leak rate.

At twelve months, radiological success resolution or significant improvement of hydronephrosis with unobstructed drainage on diuretic renography was achieved in 37/40 (92.5%) of Group A and 36/40 (90.0%) of Group B, a difference that did not reach statistical significance (p=0.99). Secondary reintervention was required in 2/40 (5.0%) of stented and 3/40 (7.5%) of non-stented children (p=0.99), again without a significant between-group difference. Table-2

Table-1: Demographics and Baseline characteristics

Variable	Group A — Stented (n=40)	Group B — Non-stented (n=40)	p-value
Mean age (years)	3.5 ± 2.5	3.7 ± 2.7	0.73
Male sex, n (%)	25 (62.5%)	24 (60.0%)	0.99
Left-sided obstruction, n (%)	22 (55.0%)	21 (52.5%)	0.99
SFU Grade III, n (%)	17 (42.5%)	18 (45.0%)	0.99
SFU Grade IV, n (%)	23 (57.5%)	22 (55.0%)	0.99
Laparoscopic approach, n (%)	14 (35.0%)	13 (32.5%)	0.99

Table-2: Comparison of perioperative outcomes, postoperative complications, surgical success, and reintervention rates between stented and non-stented pyeloplasty groups (n = 80).

Outcome	Group A — Stented (n=40)	Group B — Non-stented (n=40)	p-value
Operative time (minutes)	133.1 ± 19.0	109.5 ± 16.8	<0.001
Hospital stay (days)	3.9 ± 1.3	5.7 ± 1.9	<0.001
Pain score at 24h (VAS)	4.3 ± 1.2	3.2 ± 1.0	<0.001
Urinary leakage, n (%)	1 (2.5%)	4 (10.0%)	0.36
Urinary tract infection, n (%)	5 (12.5%)	2 (5.0%)	0.43
Overall complications, n (%)	7 (17.5%)	8 (20.0%)	0.99
Surgical success, n (%)	37 (92.5%)	36 (90.0%)	0.99
Reintervention, n (%)	2 (5.0%)	3 (7.5%)	0.99

DISCUSSION

In this study hydronephrosis resolved or improved with unobstructed drainage in 92.5% of stented children compared with 90.0% of children managed without a stent (p=0.99), figures that sit comfortably within the greater-than-90% success range reported across open, laparoscopic and robotic dismembered pyeloplasty generally. Kim et al[12], reviewing 76 renal units retrospectively, reached an almost identical conclusion that stenting made no measurable difference to hydronephrosis resolution or to complication rates on imaging follow-up (p>0.05) and used that finding to argue that a stent is an optional adjunct rather than an obligatory step in the repair.

Reintervention rates in the present cohort (5.0% stented versus 7.5% non-stented, p=0.99) likewise showed no meaningful separation, echoing the broader pattern seen in Liu et al[13] meta-analysis of 15 studies and 1,731 children, in which DJ stented, externally stented and entirely stentless approaches performed comparably on operative success and redo-surgery rates.

Overall morbidity, graded using the Clavien-Dindo system, told a similarly unremarkable story, 17.5% of stented and 20.0% of non-stented children experienced a complication of any grade (p=0.99), values close enough to argue against a clear advantage either way, though the wide confidence intervals inherent to a sample of this size mean a modest true difference cannot be excluded. Smith et al[14], working with 117 pediatric dismembered pyeloplasties across two institutions, reported nearly the same pattern more than two decades ago 12% complications with stenting against 15% without. Another 2025 systematic review and meta-analysis by Reak et al[15] similarly found stentless pyeloplasty to carry a

complication profile that was not meaningfully different from stented repair.

Where the two strategies most plausibly diverge a signal in this smaller cohort could only partly confirm statistically was in the balance between urinary leak and urinary tract infection, and in length of hospital stay. Leak was numerically four-fold less common with stenting in the present series (2.5% vs 10.0%), consistent with the biological rationale that an indwelling conduit protects the fresh suture line while it heals, and matching the direction reported by Liu et al[13], whose network meta-analysis found the DJ stented procedure carried the lowest odds of urine leakage among the three approaches examined; in our data, however, this difference did not reach conventional statistical significance (p=0.36), a finding consistent with reduced power at n=40 per arm rather than with an absence of a true effect.

Children in this study in stented arm went home sooner (3.9 ± 1.3 vs 5.7 ± 1.9 days, p<0.001), the same direction reported by Smith et al[14], albeit over far shorter absolute stays (2.1 ± 0.89 vs 2.6 ± 1.1 days, p<0.02) that most likely reflect differences in era and discharge practice rather than any true change in the biology of healing. The 2025 meta-analysis by Reak et al[15] points the same way, associating stentless pyeloplasty with a longer hospital course than the stented alternative, and Loulah et al[16], in a comparable Egyptian randomized trial, similarly found stented children discharged earlier than those managed without a stent, even though both arms achieved statistically indistinguishable long-term success.

Operative time moved in the expected direction longer with a stent (133.1 ± 19.0 vs 109.5 ± 16.8 minutes, p<0.001), a difference that, unlike the leak and infection comparisons, remained clearly significant. Kasundra et al[17] documented an even larger gap when comparing DJ stenting against nephrostomy with a trans-anastomotic stent in open pyeloplasty (118 vs 160 minutes, p=0.0001), although in their series it was the stented arm that was quicker the reverse of this study finding. Meng et als[18] meta-analysis of external versus DJ stents found no consistent operative-time penalty for either approach overall, though external stents were faster specifically in robot-assisted procedures.

A cost of stenting that data in this study capture only indirectly is the second anaesthetic every stented child in this trial required for elective removal. Jana et al[19] cited exactly this burden as their rationale for favouring a stentless approach in children, and Nagdeve et al[20], in their own randomized comparison, likewise identified avoidance of a second general anaesthetic as among the clearest benefits of stentless repair, provided the anastomosis is otherwise adequately secured. Silva et al[21] made the same argument in the context of stentless robotic pyeloplasty, noting that peri-operative urethral catheter drainage alone was sufficient in carefully selected children.

CONCLUSION

Ureteral stenting does not alter the ultimate surgical success of dismembered pyeloplasty in children with UPJ obstruction, and it continues to shorten hospital stay and lengthen the operation.

REFERENCE

1. Wei C, Wang T, Chen S, Ren X, Chen X. Concomitant management of renal calculi and recurrent ureteropelvic junction obstruction with percutaneous nephrolithotomy and antegrade balloon dilation. J Int Med Res. 2020 May;48(5):300060520911252.
2. Skolarikos A, Dellis A, Knoll T. Ureteropelvic obstruction and renal stones: etiology and treatment. Urolithiasis. 2015 Feb;43(1):5-12.
3. Ullah MH, Rahman A, Hossain KZ, Alam MJ, Rahman MM, Islam MF, et al. Postoperative Recovery Patterns of Stented vs. Non-Stented Pyeloplasty in Pediatric Ureteropelvic Junction Obstruction. IAHS Medical Journal. 2024;7(2):58-63.
4. Wiratma MK, Ghinorawa T, Yuri P. The outcome of stenting and its duration after pyeloplasty in children with ureteropelvic junction obstruction (UPJO): a systematic review and meta-analysis. BMC urology. 2025 Sep 3;25(1):227.
5. Mbwambo OJ, Lazarus J. Stentless pyeloplasty for paediatric ureteropelvic junction obstruction: a 15-year experience at Red Cross War Memorial Children's Hospital. African Urol. 2024 Mar 1;4(1):86-90.
6. Altunhan A, Soyturk S, Herrmann TR, Gauhar V, Tokas T, Sultan S, et al. Pediatric ureteral stenting: state-of-the-art review. World J Urol. 2026 Dec;44(1):289.
7. Prasad G, Sahni DS, Sehgal M, Anand S. Postoperative antibiotic prophylaxis following pyeloplasty in children with ureteropelvic junction obstruction: evidence from a systematic review and meta-analysis. Pediatr Surg Intern. 2025 Dec;41(1):1-2.
8. Hossain MS, Rasel MR, Dhar LC, Roy S, Rahman SM, Tanim MH. Outcome of short-term double-j stenting in comparision with long term in Anderson Hynes Pyeloplasty for Pelvi-Ureteric Junction Obstruction. environment. 2024 Dec 20;10:11.
9. Khan M, Gondal MF, Ahmad A, Fraz MO, Ahmed N, Talib A. Comparison of Hospital Stay in Stented Versus Non-Stented Pyeloplasty in Children with Pelviureteric Junction Obstruction. Life Sci. 2023 Oct 5;4(4):6-8.
10. González SG, Tur AB, Rosito T, Gonzalez IP, Iturralde JF, Gonzalez IT. Is Routine Double-J Stenting Necessary in Pediatric Pyeloplasty?. Cureus. 2026 Mar 13;18(3): e105170.
11. Elbatarny AM, Elafifi MA, Hashish AA, Elsharaby AM. Stented versus nonstented open pyeloplasty for primary ureteropelvic junction obstruction in children. Tanta Med J. 2014 Jul 1;42(3):92-7.
12. Kim J, Park S, Hwang H, Kim JW, Cheon SH, Park S, Kim KS. Comparison of surgical outcomes between dismembered pyeloplasty with or without ureteral stenting in children with ureteropelvic junction obstruction. Korean J Urol. 2012;53(8):564-8.

13. Liu X, Huang C, Guo Y, Yue Y, Hong J. Comparison of DJ stented, external stented and stent-less procedures for pediatric pyeloplasty: a network meta-analysis. Int J Surg. 2019;68:126-33.
14. Smith KE, Holmes N, Lieb JI, Mandell J, Baskin LS, Kogan BA, et al. Stented versus nonstented pediatric pyeloplasty: a modern series and review of the literature. J Urol. 2002;168(3):1127-30.
15. Reak AD, Situmorang GR, Wahyudi I, Rodjani A, Raharja PAR. The safety and efficacy of stentless pediatric pyeloplasty: a systematic review and meta-analysis. Transl Res Urol. 2025;7(3):103-13.
16. Loulah MA, Dorgham MN, Zeid NA. Stented versus stentless open pyeloplasty in children. Menoufia Med J. 2018;31(1):188-92.
17. Kasundra A, Thanneeru S, Ahmad R, Chanchalani R, Sharma PK. A comparative analysis of double-J stent and nephrostomy with a transanastomotic stent in open pyeloplasty for pelviureteric junction obstruction in children: a prospective observational study. Cureus. 2025;17(8):e90035.
18. Meng C, Gan L, Li K, Peng L, Li J, Yang J, et al. Comparison of external stents and DJ stents techniques for pediatric pyeloplasty: a systematic review and meta-analysis. Front Pediatr. 2022;10:933845.
19. Jana IA, Hussain M, Khan E, Aurakzai HU, Hanif S. Stentless pyeloplasty for ureteropelvic junction obstruction in children. Ann Pediatr Surg. 2015;11(1):18-20.
20. Nagdeve NG, Bhingare PD, Sarawade P. A randomized control trial comparing outcome after stented and nonstented Anderson-Hynes dismembered pyeloplasty. J Indian Assoc Pediatr Surg. 2018;23(4):186-91.
21. Silva MV, Levy AC, Finkelstein JB, Van Batavia JP, Casale P. Is peri-operative urethral catheter drainage enough? The case for stentless pediatric robotic pyeloplasty. J Pediatr Urol. 2015 Aug;11(4):175.e1-5.