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Original Article

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Comparison Between Transmesocolic Approach and Laterocolic Approach for Left Sided Needlescopic Pyeloplasty in Children

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Abstract

Background: *Transmesocolic (TMC) approachis an alternative approach to ureteropelvic junction (UPJ) that has been shown to reduce operative time compared to the standard laterocolic (LC) approach during laparoscopic pyeloplasty. It offers a direct path to the left UPJ through the mesocolon with less tissue dissection and bowel manipulation. In this study we evaluated the outcome of transmesocolic (TMC) laparoscopic pyeloplasty compared with conventional laterocolic procedure.*

Materials and Methods: *We started laparoscopic pyeloplasty for ureteropelvic junction obstruction in 2015. Since then, 56 patients of left side disease have undergone this surgery in our institution. To access the left ureteropelvic junction, we used the conventional latero-colic (LC) approach in 33 patients, while the transmesocolic (TMC) approach was used in the remaining 23 patients, and perioperative results and follow-up data were then compared.*

Results: *The mean operative time using the transmesocolic approach was significantly shorter than the conventional laterocolic approach (97 vs. 160 min,* p=0.022*). Furthermore, there was no complication or open conversion. In early postoperative period, 1 (3.03%) patient in laterocolic approach group developed ileus. Postoperative pain, mean hospital stay was similar in both groups. All patients were symptom-free after 1 year of follow-up, and radiologic success rates for each group were 90 and 88%, respectively.*

Conclusion: *Direct exposure of the ureteropelvic junction via the mesocolon saves time during the colon mobilization procedure. The approach is safe and feasible and has success rates similar to those of the conventional laterocolic approach.*

Keywords: Needlescopic pyeloplasty, Transmesocolic(TMC) approach, Laterocolic(LC) approach, Pelviureteric junction obstruction(PUJO)

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Introduction:

Although classically open pyeloplasty is the standard surgery for Pelviureteric junction obstruction (PUJO), laparoscopic pyeloplasty (LP) has has now established as a feasible and reliable treatment option in treating PUJO with a success rate equivalent to that of the classic open procedure[1]. Now needlescopic pyeloplasty is further miniaturization of the ports where for camera and Lens a 5 mm port is used and for working, 3 mm ports are used. At the start of the surgery after entering into the abdomen, in order to expose the PUJ, conventionally colon is mobilized medially from the line of Toldt. This requires gut handling and also time consuming.

Transmesocolic (TMC) approach is an alternative approach to ureteropelvic junction (UPJ) that has been shown to reduce operative time compared to the standard laterocolic (LC) approach during laparoscopic pyeloplasty[2]. It offers a direct path to the left UPJ through the mesocolon with less tissue dissection and bowel manipulation. In this study we evaluated the outcome of transmesocolic (TMC) needlescopicpyeloplasty compared with conventional laterocolic (LC) procedure.

In this study we evaluated the outcome of transmesocolic (TMC) needlescopicpyeloplasty compared with conventional laterocolic(LC) procedure in children.

Materials and Methods:

Between 2015 and 2019, a total of 56 patients of left sidedPUJO have undergone needlescopic pyeloplasty in Advanced Center of Kidney and Urology (ACKU) and Shaheed Suhrawardy Medical College Hospital (ShSMCH), Dhaka.The presence of hydronephrosis was detected by ultrasound or computed tomography, and the diagnosis of UPJO was confirmed by diuretic radionuclide renography (delayed urinary excretion: T1/2 >20 min).

To access the left ureteropelvic junction, we used the conventional laterocolic (LC) approach in 33 patients, while the transmesocolic (TMC) approach was used in the remaining 23 patients, and perioperative results and follow-up data were then compared. Single Surgeon performed all the surgeries under general anaesthesia. The decision to use TMC or LC approach was made intraoperatively. The mesocoloic field was inspected after achieving laparoscopic vision, and the TMC technique was selected if the mesocolon bulged enough to identify the renal pelvis lying behind.

Technique for left TMC laparoscopic pyeloplasty

Under general anesthesia (GA) patient was placed in lithotomy position and cystoscopy and retrograde pyelography (RGP) was performed. After PUJO and distal patency was confirmed, a 3 Fr Ureteric catheter was placed over a guide wire into the renal pelvis. Then the patient was positioned into left lateral position. Pneumoperitoneum was created by Veress needle technique.A 5-mm trocar was introduced para-umbilically. The peritoneal cavity was inspected using a 5-mm endoscope, then 2 other 3mm working ports were placed. After entering the abdomen, mesoclolic window was checked. As the small gut fell down due to patients position and colon remianed fixed to the lateral wall, a mesoclolic window is usually found through which a bulged renal pelvis is seen in the retroperitoneum (Fig 1). Once adequate mesoclolic window fonud, an incision in the mesoclon was given and retroperitoneum was entered (Fig 2). Then gradual dissection was performed to mobilise the PUJ adequately to perform anastomosis after removing the narrow part. Anastomosis was done using a 5/0 monofilament interrupted suture (monocryl). We routinely placed a DJ stent inside the ureter which was removed 6 weeks later.

Techniques for LC laparoscopic pyeloplasty

Under GA, cystoscopy and RGP followed by placement of a 3 Fr ureteric catheter was done in similar procedure like the patients in TMC group. Pneumoperitoneum was created by Veress needle technique. Similar ports like TMC group was placed. On inspection if adequate mesocolic window was not seen, then lateroclolic approach was taken. Descending colon was mobilized medially for the line of Toldt to expose the PUJ. Once

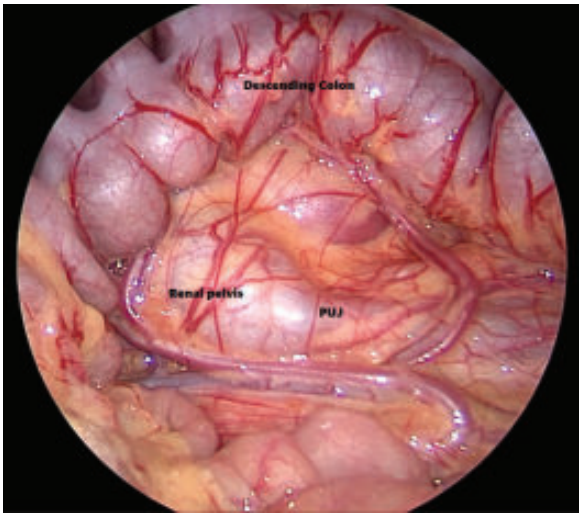

Figure 1

adequate mobilization was done, dismembered pyeloplasty was performed. Anastomosis was done using a 5/0 monofilament interrupted suture (monocryl). We routinely placed a DJ stent inside the ureter which was removed 6 weeks later.

Results:

Table I shows the preoperative variables. Age of the patients in both TMC and LC groups were similar (3.27 ± 2.47 years Vs 3.05 ± 2.44, p=0.170). Most common presentation was flank pain (13 vs 17). Male/Female ratio in both groups were similar (p = 0.205).

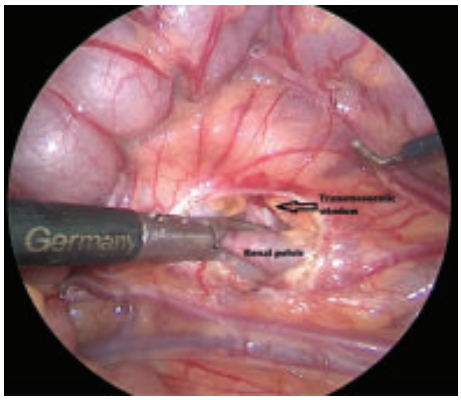

Figure 2

Table I: Preoperative Variables

	TMC, n= 23	LC, n = 33	P Value
Age, yrs (range)	3.27 ± 2.47 (2 m -11 Y)	3.05 ± 2.44 (3 m – 10 Y)	0.170
No. females/males	10/13	16/17	0.205
Presenting symptoms			
Flank Pain	13	17	0.712
Recurrent UTI	5	8	0.732
Incidental	3	4	0.857
Prenatal diagnosis	2	4	0.510

Operating time was significantly shorter in TMC group (97 ± 23 minutes Vs 160 ± 28 minutes, p = 0.022). Although mean blood loss was lower in TMC group, but the difference was not significant. Maximum estimated blood loss was about 128 ml in a patient in LC group. Post-operative hospital stay was also similar in both group (3.2 ± 1.8 days vs 3.5±1.6 days, p = 0.778). One patient in LC group developed ileas on 2nd POD and hence was kept in hospital for 5 days. No other complication was observed in both groups (Table II).

All patients were symptom-free after 1 year of follow-up, and radiologic success rates for each group were 90 and 88%, respectively (Table III).

Table II: *Perioperative and Postoperative parameters*

Mean±SD (range) or n (%)	TMC, n = 23	LC, n= 33	p value
Operative time, min. median (range)	97 ± 23 (74-110)	160 ± 28 (132 - 188)	**0.022**
Estimated mean blood loss (ml)	50 ± 24	100 ± 28	0.085
Post Op hospital stay	3.2 ± 1.8	3.5±1.6	0.778
Complications			
Intraoperative	None	None	
Postoperative	None	Ileas (1)	

Table III: *Outcome*

Mean±SD (range) or n (%)	TMC, n = 23	LC, n= 33	p value
Success rate (%) after 1 year of surgery			p value
Resolution of symptoms (symptomatic patients)	100%	100%	1.00
DTPA renal scan ($T^{1/2}$ <20 min)	21/23 (91%)	29/33 (88%)	0.855

Discussion:

Open pyeloplasty has been the standard for correction of PUJO, but it has the morbidities and complications that comes with a open procedure. Laparoscopic approach provides several ad-vantages (decreased postoperative pain, reduced hospital stay, and better cosmesis)[3,4]. Needlescopic approach further miniaturized the access. But this procedure is technically challenging and has a stiff learning curve[5]. The technical difficulties of LP have been analyzed in several reports, and intracorporeal suturing was found to be the most-commonly noted time-consuming step, especially for beginners of LP. So needlescopic pyeloplasty requires a skilled and experienced surgeon.

Pyeloplasty on the right side normally doesn't require extensive colonic mobilization. In contrast, the standard left side ap-proach starts with a long vertical incision along the line of Toldt and subsequent dissection of the colonic flexure to move the colon medially and access the UPJ. This step gen-erally consumes considerable time for beginners and cre-ates surgical smoke and bleeding in the field, disrupting laparoscopic vision and consequently making the procedure difficult. The new TMC technique offers faster and safer access to the UPJ by avoiding colonic mobilization. Espe-cially in cases where a redundant pelvis is present, meso-colic fat of the descending colon may be very thin or eventransparent. With simple dissection of the thin layer, the un-derlying UPJ can be accessed. By avoiding bowel manipu-lation, this approach diminishes operative time, minimizes surgical smoke and bleeding, and consequently offers a clearer operative field[6].

Romero, et alreported good success rates by using both TMC and LC approaches. Specifically, the TMC ap-proach offered a 22.5% reduction in operative time and a shorter hospital stay. We also observed a similar result.

One thing must be kept in mind that, decision to use TMC approach should be taken after inspecting the mesocolic window. Some times mesocolic fats are so thick that it hampers identification of retroperitoneal PUJ. In some cases we also observed mesenteric important vessels lying in front of the PUJ, making it difficult to create a working window in the mesocolon without risking an injury to the mesenteric vessels. In these cases, LC approach is safer. Sometimes we temporarily sutured renal pelvis to the lateral abdominal wall for better exposure and traction during anastomosis. We also found pre placement of a ureteral catheter helpful in identification of ureter. Although, Theoretically, preoperative ureteral stent placement may decompress the renal pelvis, render its dis-section and mobilization more difficult, and may also impede intraoperative identification of the stenosis[7]. However, needlescopic pyeloplasty has excellent outcome with very less post-op morbidity. This field is still developing and with experience a surgeon may achieve finer results.

Conclusion:

In conclusion, the result of our study demonstrates that, direct exposure of the ureteropelvic junction via the mesocolon saves time during the colon mobilization procedure. The approach is safe and feasible and has success rates similar to those of the conventional laterocolic approach.However, further experience is needed to verify the learn-ing curves and long-term outcomes.

References:

1. Moon DA, El-Shazly MA, Chang CM, Gianduzzo TR, Eden CG. Laparoscopic pyeloplasty: evolution of a new gold standard. Urol-ogy 2006;67:932-6.
2. Romero FR, Wagner AA, Trapp C, Permpongkosol S, Muntener M, Link RE, et al. Transmesenteric laparoscopic pyeloplasty. J Urol 2006;176(6 Pt 1):2526-9.
3. Inagaki T, Rha KH, Ong AM, Kavoussi LR, Jarrett TW. Laparo-scopic pyeloplasty: current status. BJU Int 2005;95 Suppl 2:102-5.
4. Türk IA, Davis JW, Winkelmann B, Deger S, Richter F, Fabrizio MD, et al. Laparoscopic dismembered pyeloplasty—the method of choice in the presence of an enlarged renal pelvis and crossing vessels. EurUrol 2002;42:268-75.
5. Araki H, Ono Y, Hattori R, Goto M, Yamamoto T, Kimura T, et al. Laparoscopic pyeloplasty using endoscopic GIA stapler for ure-teropelvic junction obstruction. J Endourol 2005;19:143-6.
6. Porpiglia F, Billia M, Volpe A, Morra I, Scarpa RM. Transperito-neal left laparoscopic pyeloplasty with transmesocolic access to the pelvi-ureteric junction: technique description and results with a minimum follow-up of 1 year. BJU Int 2008;101:1024-8.
7. Mandhani A, Goel S, Bhandari M. Is antegrade stenting superior to retrograde stenting in laparoscopic pyeloplasty? J Urol 2004; 171: 1440-2.