Stentless versus stented laparoscopic pyeloplasty, A comparative study

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Abstract: Objectives: To compare stented versus stentless laparoscopic pyeloplasty (LP) in treatment of uretero pelvic junction obstruction regarding success rate, operative time, blood loss, intra and post operative complications, analgesic requirement and hospital stay. **Patients and Methods:** A prospective randomized study was done on 45 patients underwent LP from May 2013 to March 2016 at Al-Azhar University Hospitals. The studied patients were classified into two groups, **Group A (stented LP),** Included 25 patients (12 males & 13 females) were treated with stented LP, their age ranged from (5 – 35 years) with mean age of 18.60. **Group B (stentless LP),** Included 20 patients (13 males & 7 females) were treated with stentless LP, their age ranged from (3.5 – 26 years) with mean age of 14. All procedures were performed transperitoneally. Anderson Hynes pyeloplasty was done for 41 Patients, while y-v flap was done for 4 patients. Patients were followed with clinical assessment, urine C&S after three months and IVU, DTPA scan after six± twelve months. Perioperative parameters including operative time, analgesic use, hospital stay, complications and success rates were compared. **Results:** The mean operative time was 180.27 minutes ±SD 29.41 (range 110-222.5 minutes) in group A, while the mean operative time was 124.66 minutes ±SD 28.75 (range 80-180 minutes) in group B No significant intraoperative complications or blood loss in both group. Success rate was 92% in group A and 90 % in group B. leakage was detected in 60% of group B and 8% in group A. No significant difference in hospital stay or analgesic requirement in both groups. **Conclusion:** Although stentless LP has an increased risk for persistent leakage in early post operative period, it is considered to be safe and effective as its stented counterpart with the advantage of avoidance of stent related symptoms and another cystoscopy for DJ stent removal.

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1. Introduction

Ureteropelvic junction obstruction (UPJO) was traditionally managed by open pyeloplasty via a retroperitoneal approach. With the advent of minimally invasive surgery (MIS), there is an increasing role for the laparoscopic approach in performing this operation. With its ability to replicate each step of open surgical procedure, laparoscopic approach provides a combination of equivalent success rates of open surgery (>90%) and advantages of decreased pain, improved cosmesis, shorter hospital stay and an early return to full activity.(7)

An important adjunct to laparoscopic pyeloplasty is the placement of a JJ stent across the ureteropelvic junction (UPJ) either retrograde or antegrade (14). The advantages of stent placement following pyeloplasty include lowering the risk of urinoma formation, ensuring urinary drainage, maintaining ureteric calibre and anastomotic alignment, and lowering the impact of postoperative edema at the anastomotic site (12). Egan and co-workers (4) have shown that JJ stenting may result in more rapid resolution of hydronephrosis after pyeloplasty. Stent malpositioning have been reported with blind antegrade stenting. Malpositioning of the lower end of the JJ stent is usually associated with difficulties to negotiate the ureterovesical junction (9).

JJ stent is not free from symptoms. Stent has been found to be associated with stent syndrome, Somers (13) reported stent related complication rate was 94%. Joshi et al. (5) found that more than 80% of patients had stent-related pain affecting daily activities, 32% experienced sexual dysfunction, and 58%, reduced work capacity and negative economic impact. Other potential problems include migration, encrustation, retained or forgotten fragments, exposure of the upper tract to high pressure during micturition, flank pain and increased urinary infections (3).

Evidence based literature supports the practice of stentless open pyeloplasty in uncomplicated cases. However, in laparoscopic pyeloplasty (LP), it is still a traditional practice to stent the anastomosis (12). More recently, there seems to have been a trend towards non-stented repairs (8,11).

2. Patients and Methods:

A randomized prospective study was done on 45 patients underwent LP (25 stented LP and 20 stentless LP) from May 2013 to March 2016 at Al-Azhar University Hospitals(AL Hussien & Sayed Galal

hospitals). The studied patients were classified into two groups according to treatment modality, Group A (stented LP): Included 25 patients (12 males & 13 females) were treated with stented LP, their age ranged from (5 – 35 years) with mean age of 18.60. Group B (stentless LP): Included 20 patients (13 males & 7 females) were treated with stentless LP, their age ranged from (3.5 – 26 years) with mean age of 14. All Pt treated with transperitoneal Anderson Hynez LP, except 4 cases (3 from group A & 1 from group B) were done as Y-V flap LP. Stent removal was done after 6 weeks in group A, history of stent related symptoms and complications (frequency, dysuria, hematuria,.… etc) is taken at the time of stent removal in group A. post operative follow up was done after 3 months by clinical assessment, urine analysis, C&S. IVU and DTPA were done after 6 months then DTPA ± IVU were done after 12 months according to clinical assessment. Clinical, radiological and laboratory improvement were considered as successful outcome, while improvement of one or two of them were considered satisfactory outcome.

3. Results:

The mean age in group A was 18.60 years SD ±8.07 (range 5-35 years), while the mean age in group B was 14.92±7.41 (range 3.5-26 years). Right laparoscopic pyeloplasty was performed in 19 patients (42.22%) while, left laparoscopic pyeloplasty was performed in 26 patients (57.88%).

Twenty one patients (84 %) presented with unilateral renal pain in group A, three patients (12%) were incidentally discovered and one patient (4%) presented with dysuria. In group B, 13 patients (65%) presented with unilateral renal pain, 6 patients (30%) were incidentally discovered and one patient (5%) presented with abdominal swelling.

Crossing vessels were encountered in twenty patients (44.44%), and renal stones were associated with the UPJO in two patients (4.44%), these stones were removed laparoscopically.

Renography in all patients included in the study demonstrated obstructed curve. The mean GFR in group A was 35.82 ml/min. ± 15.99 ranged from 10-60 ml/min, while the mean GFR in group B was 34.72 ml/min ± 17.99 ranged from 7.70-67.14, with no significant differene.

The mean operative time was 180.27 minutes ±SD 29.41 (range 110-222.5 minutes) in group A, while the mean operative time was 124.66 minutes ±SD 28.75 (range 80-180 minutes) in group B, with highly statistically significant difference (P value 0.000). The mean time of regain of intestinal sounds in group A was 13.839± SD 7.510 hours (range 6-48 hours), while the mean time in group B was 12.933 ± SD 9.881 hours (range 8-48 hours), with no statistically significant difference. The mean time till urethral catheter removal postoperatively in group A was 2.774± SD1.521 days (range 1-8 days), while the mean time in group B was 2.933 ± SD 3.674 days (range 1-10 days), with no statistically significant difference.

The mean time for drain removal in group A was 3.710 ± SD 1.371 days (range 2-9 days), while the mean time in group B was 4.933 ± SD 4.131 days (range 2-11 days), with no statistically significant difference.

Leakage was the most common early post operative complication in the study. It was found in 2 patients (8%) in group A and 12 patients (60%) in group B. The 2 patients of group A were managed conservatively. Out of the 12 patients of group B, 10 patients were managed conservatively, one developed intra peritoneal free fluid collection (urinoma), US guided drain was fixed at 2nd post operative day, then DJ stent insertion was done at the 10th post operative day and the other one underwent DJ stent insertion at the 10th post operative day. Ileus was the second most common complication, it was detected in 3 patients (12 %) in group A, and 5 patients (25 %) in group B, 6 patients of them were had leakage or urinoma, while 2 of them were young age (3.5 and 5 years). Regarding fever, it was found in 5 patients (20%) in group A and 1 patient (5%) in group B. stent symptoms in group A, out of 25 patients with sented LP, 18 patients (72%) complained of loin pain and dysuria, 10 patients (40%) complained of hematuria, 5 patients (20%) complained of urgency, 2 of them (8%) suffered from urge incontinence for 3-5 days post catheter removal and they talk anticholenergic drugs till stent removal.

Forty one patients (23 in group A and 18 in group B) have shown both radiological and clinical improvement with four cases of failure (two cases for each group) with an overall 91.11% success rate(92% in group A and 90% in group B with no significant difference P value 0.688). These four patients suffered from recurrence of the flank pain, with radiological evidence of obstruction at the new UPJ. They were subjected to antegrade percutaneous endopyelotomy after retrograde study to manage their state of re-stenosis.

Results of the Renogram parameters pre and postoperatively in group A are illustrated in table 1.

Table1. Renogram results pre and postoperatively in group A

Characteristics	Pre	Post	P value
Ipsilateral GFR	35.82± 15.99	44.86±14.82	0.000 **
Contralateral GFR	60.07 ± 15.72	66.68 ± 14.34	0.001*
Ipsilateral Split function	36.28 ± 12.21	39.66 ± 10.74	0.001**
T 1/2	15.76 ± 2.63	8.60 ± 3.19	0.002**

Results of the Renogram parameters pre and postoperatively in group B are illustrated in table 2.

Table 2. Renogram results pre and postoperatively in group B

Characteristics	Pre	Post	P value
Ipsilateral GFR	34.72 ± 17.99	41.31±17.21	0.002**
Contralateral GFR	55.80 ± 12.38	57.17± 14.09	0.343*
Ipsilateral Split function	36.09± 10.47	39.82±9.10	0.024
T 1/2	14.15 ± 6.70	6.70± 2.65	0.000**

Study showed little usage of post operative analgesics with no statistically significant difference between both groups.

There were 3 cases had long period of hospitalization for persistent leakage post operative, one from group A, managed conservatively, patient improved and drain removed at 8thpost operative day. The other 2 patients were from group B, they underwent DJ stent insertion at the 10thpost operative day and discharged one day later.

Table 3: Hospital stay

variables	HOSP. STAY						T-test	
	Group A			Group B			T	P-value
Range	3	-	10	3	-	12	-1.193	0.239
Mean±SD	4.742	±	1.437	5.533	±	3.091		

4. Discussion

Laparoscopic pyeloplasty has become the treatment of choice for UPJO in centers with advanced laparoscopic expertise, as the procedure is technically challenging and require proficiency in intracorporeal suturing (11,12). Evidence based literature supports the practice of stentless open pyeloplasty in uncomplicated cases. However, in laparoscopic pyeloplasty (LP), it is still a traditional practice to stent the anastomosis ***(12).*** More recently, there seems to have been a trend towards non-stented repairs ***(8,11)***.

Shalhav et al., 2007commented on 5 patients who have undergone stentless LP with a mean follow-up of 15.7 months. Mean age and body mass index of this group were 42.8 years and 29.3 kg/m2, respectively. Mean operative time, estimated blood loss, and hospital stay were 196 minutes, 58 mL, 1.6 days, respectively. No intraoperative complications occurred. Only one patient complained of flank pain. No obstruction or urinary extravasation was seen on retrograde pyelography, but a ureteral stent was placed. During follow-up, all patients had complete resolution of their symptoms. Postoperative renal scans demonstrated improved urinary drainage in all patients. ***(11).***

In this study, transperitoneal LP was done for 45 patients divided into two groups, group A included 25 treated by stented LP, while group B included 20 patients treated by stentless LP.

The mean operative time in our study was 180 min. for group A range (110-222), while it was 124 min. in group B range (80-180). Operative time was significantly less in group B than group A, this is due to doing the stentless LP by a senior laparoscopic surgeon, and it is not due to avoidance of stent placement as it is matter of minutes. There are no intra operative complications or significant blood loss in our study. Leakage was the most common complication in our study, founded in 2 patients (8%) in group A and 12 patients (60%) in group B, two of them (10%), underwent DJ stent insertion. Ileus was the second most common complication, it was detected in 3 patients (12 %) in group A, and 5 patients (25 %) in group B. Fever was founded in 5 patients (20%) in group A and 1 patient (5%) in group B, and one patient (5%) developed urinoma in group B.

Regarding stent symptoms in group A, out of 25 patients with sented LP, 18 patients (72%) complained of loin pain and dysuria, 10 patients (40%) complained of hematuria, 5 patients (20%) complained of urgency, 2 of them (8%) suffered from urge incontinence for 3-5 days post catheter removal and they talk anticholenergic drugs till stent removal.

We noticed in our study that avoidance of intraoperative calibration of the ureter even by guide wire decreased the rate of postoperative leakage. This is may be due to disturbance of anti reflux mechanism at the ipsilatral ureter and this theory augmented by decreased amount of drain output after reinsertion of uretheral catheter in three patients with persistent leakage in stentless group. At the same time calibration of the ureter may results in oedema or blood clots which were the probable cause of leakage in previously published studies.(11,2,10)

It is important to mention that there were patients suffered from leakage and urinoma post stented LP, one of them underwent PCN tube insertion, also there were failed cases in the follow up period in both groups. This means that presence of DJ stent by itself did not prevent persistent leakage or increase the success rate and the main issue is to apply the correct surgical principles all over the procedure.

Our success rate was 92% in stentd group and 90% in stentless group, with no significant difference between both groups.

Our mean hospital stay was 4.74 range (3-10 days) in stented group and 5.53 range (3-12 days) in stentless group.

There was 3 cases had long period of hospitalization for persistent leakage post operative, one from group A, managed conservatively, patient improved and drain removed at 8th post operative day. The other 2 patients were from group B, they underwent DJ stent insertion at the 10th post operative day and discharged one day later.

Conclusion:

Although stentless LP has an increased risk for persistent leakage in early post operative period, it is considered to be safe and effective as its stented counterpart with the advantage of avoidance of stent related symptoms and another cystoscopy for DJ stent.

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