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STENTLESS LAPAROSCOPIC PYELOPLASTY: SAFETY AND OUTCOME

Surgery

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ABSTRACT

Introduction Pyeloplasty, whether open or laparoscopic, has been the mainstay of treatment for pelviureteric junction obstruction (PUJO). This study analyses the outcome of transperitoneal laparoscopic pyeloplasty without a J J stent. Stenting after pyeloplasty is an established practice and helps in ensuring a patent anastomosis until healing has completed. Stents, however, may cause complications such as infection and displacement and increase the cost of management; therefore, stentless pyeloplasty is now considered as feasible alternative.

Patients And Methods This was a prospective observational study, conducted from 2015 to 2018. We analyzed the results of stentless surgery in patients with pelviureteric junction (PUJ) obstruction. 20 patients with congenital PUJ obstruction were managed. In all patients stentless transperitoneal laparoscopic Anderson-Hyene's pyeloplasty was done. Preoperative differential renal function, operative time, post operative complications (pain, drain output, fever), hospital stay and renal functional outcomes (Tc99 DTPA) were recorded. Perioperative and postoperative parameters were analysed.

Results Among 20 patients, who were studied, 15 male patients and 5 were females; with a male-to-female ratio of 3 : 1. 16 patients had left and 4 right; no bilateral case was observed in this study. Double J stent was not placed in any pyeloplasty. The mean operative time was 120 min. The mean perinephric drain removal time was 2 days. None of the patients had persistent urinary leak. 1 patient has persistent hematuria and another one persistent fever and both were managed conservatively (Grade 1 Cleavien-Dindo). Persistent/increase in hydronephrosis was observed in 1 (5%) patient; endopyelotomy was done in this patient after 2 years of follow-up. The mean hospital stay of study patients was 3.2 days. No mortality was observed in our study.

ConclusionStentless pyeloplasty for PUJ obstruction is a safe and feasible technique; it reduces the morbidity, cost of surgery and avoids multiple procedures.

KEYWORDS

Laparoscopic, pyeloplasty, stent

INTRODUCTION

Although "Anderson-Hynes" dismembered pyeloplasty was first described for the treatment of an obstructed retrocaval ureter in 1949,[1] it is currently the gold standard surgery for pelvicureteric junction obstruction (PUJO), with a success rate greater than 90%.[2] The treatment of PUJO has changed considerably in recent years with the development of laparoscopy and endopyelotomy. Schuessler et al.,[3] first performed a laparoscopic pyeloplasty in 1993 and since then it has been established as a valid technique to correct PUJO.

An important adjunct to laparoscopic pyeloplasty is the placement of a double J stent across the pelviureteric junction (PUJ) either retrograde[4] or antegrade.[5] Double J stent, however, acts as a splint across the anastomosis and is not free from symptoms. Many patients suffer from severe stent-related symptoms necessitating their early removal. In a study, more than 80% of patients experienced stent-related pain affecting daily activities, 32% experienced sexual dysfunction, and 58%, reduced work capacity and negative economic impact.[6] A complication rate of 94% was reported in another study.[7]

Evidence based literature supports the practice of stentless open pyeloplasty in uncomplicated cases.[8]

Stenting has remained a standard practice for achieving optimal results of pyeloplasty. [9] Stents have the disadvantage of infections, displacements, breakage, and increased cost of surgery. [8,9] The fear with stentless pyeloplasty is anastomosis dehiscence, leakage, and higher incidence of stricture formation. It has been shown by various studies that the incidence of complications by stented and stentless pyeloplasty may be similar results. [10,11] Stentless pyeloplasty has the advantage of less hospital stay, avoidance of a second procedure, and decreased cost of surgery. Studies have proved the safety and efficacy of stentless pyeloplasty in open, laparoscopic, and robotic-assisted pyeloplasties. [11,12]

We observed our results of stentless pyeloplasty with a view to evaluate the safety, efficacy, and cost effectiveness of stentless pyeloplasty.

MATERIAL AND METHODS:

From July 2015 to August 2018, we randomly selected 20 patients of PUJ Obstruction (age range 18-50 yrs), after explaining the procedure and the need for stent placement, to undergo stentless transperitoneal laparoscopic pyeloplasty (Anderson-Hynes technique). All patients were preoperatively assessed with history, physical examination, abdominal ultrasound, Intravenous urogram (IVU) and diuretic renal scan. The decision for not using stent was strictly based on surgeon's preference and not on grade of hydronephrosis, age of patient, differential renal function or build of the patient. Previously operated patients were excluded from our study.

Laparoscopic pyeloplasty was done using three ports in patients with left PUJ obstruction and four ports in patients with right PUJ obstruction. All surgeries were performed by a single surgeon. Anastomosis was done with 4/0 vicryl in all patients. Interrupted suturing was done in all patients, to avoid confounding. Stentless dismembered pyeloplasty was done in all cases. To avoid rotation of ureter, anatomical spatulation technique was used in all patients. [13] Anatomical spatulation also avoids handling of the ureter for making an incision once it is dismembered. In this technique, after giving a nick in the renal pelvis just proximal to the UPJ, scissors are directed towards the ureter, which is then spatulated on the lateral side towards the kidney. Ureter is then dismembered.

Technique Of Stentless Pelviureteric Junction Anastomosis:

After general anesthesia and patient positioning (lateral decubitus) desired ports are placed. After exposing the pelvis and upper ureter, PUJ is identified and anatomical spatulation technique is used. Firstly, we complete the posterior suture line at neopelviureteric junction; then the anterior suture line is completed. However, no temporary intubation across the anastomosis is done. After this, rest of the renal pelvis is sutured in a continuous fashion. Water tightness of the suture line is checked by injecting saline mixed with methylene blue dye into the renal pelvis to distend it with a laparoscopic needle. A tube drain is placed near the anastomosis. The drain is removed in the post operative period accordingly.

Age, gender, preoperative differential renal function, operative time,

operative findings, post operative complications (pain, drain output, fever), hospital stay and any improvement in the renal functional outcomes (Tc^{99} DTPA) is recorded. Operative time is measured from insertion of first port to closure of last port. The follow-up schedule includes a visit at two weeks with suture/clip removal, urine analysis and clinical examination. Diuretic renogram is done at six months of surgery and then every 6-12 months to look for the outcome of the procedure.

RESULTS:

A total of 20 patients were observed in our study. All the patients had primary PUJ Obstruction and none had any history of surgical intervention. 15 patients were males and 5 were females with a ratio of 3:1. The mean age of study group was 27 years (range 18 years - 50 years).

Sixteen patients had left and four had right sided PUJO. All patients were symptomatic and had proven significant obstruction on Tc^{99}-DTPA renal scan.

Median operative time was 120 min (90-140 minutes). Crossing vessel was present in 3 patients and transposition was done in these cases. None of the patients had conversion to open surgery. Urethral catheterization was done in all patients and was removed, usually on 1st post-operative day. Drain output varied from minimal to maximum of 650 ml on first postoperative day that decreased gradually in most patients and drain was removed on second or third postoperative day in most of the cases. Median time to bowel movement was 36 hrs (24-40 hrs). None of the patients had any signs of peritonitis in the postoperative period. One patient each developed persistent hematuria and post-operative fever and were managed conservatively and were classified as cleavian-Dindo grade 1. One patient had negligible improvement of renal function parameters on the operative side and endopyelotomy was done after a follow-up of 2 years.

The mean hospital stay (calculated as time after the surgery) was 3.2 days (range 2-6 days).

The median preoperative differential renal function of the involved kidney was 40% (20-50%). All patients had relief of symptoms and 19 (95%) had shown nonobstructed drainage with improved differential renal function on post operative renal scan at the follow-up. Of the patient who showed post-operative obstructive renal scans, still patient was symptom free but required endopyelotomy after 2 years of follow-up.

Demographic Profile And The Outcome Of 20 Patients Of Stent Less Pyeloplasty

Parameter	N (%)
Number of patients	20
Mean age in years (range)	27(18-50)
Mean operative time in minutes (range)	120(90-140)
Patients needing post operative intervention	1(5%)
Early and late postop complications	2(10%) and 1(5%)
Improvement in post operative renal scan	19(95%)
Symptomatic relief	20(100)

DISCUSSION:

Pelviureteric junction obstruction 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. Laparoscopic pyeloplasty is continuously evolving with various modifications to simplify the technique to make it a truly minimally invasive approach. There has been an ongoing debate on the merits of intubated versus non-intubated (stent less) repair of PUJO done either by laparoscopic or open technique.

Stenting the anastomosis after pyeloplasty for PUJ obstruction has remained a standard procedure with excellent results. [10] Stenting keeps the anastomosis patent until healing has completed. It also minimizes the risk for leakage, obstruction, and adhesions after pyeloplasty. Various forms of stent have been used for this purpose, the most popular being double J stent that is usually removed through cystoscopy 2–4 weeks after surgery. [14] Although the stents help in achieving the results of a good pelviureteric anastomosis, they have some disadvantages such as cost of stent, removal under anesthesia, and complications such as infection, displacement, breakage, stone formation, prolapse, etc. [11,15]

With the improvement in the surgical techniques and the availability of better suture material, the previously feared complications of stentless pyeloplasty, such as stricture, leakage, urinoma formation, adhesions, and recurrence, can now be avoided in most cases.

The outstanding results in our patients with primary PUJ Obstruction is because of meticulous atraumatic, vascular and watertight suturing along with anatomical spatulation that prevents rotation of the ureter. Similarly, good hemostasis is mandatory to avoid hematuria and formation of clots, which can hinder the drainage of urine.

CONCLUSION

In experienced hands, laparoscopic stentless pyeloplasty is an effective and feasible method for treating PUJ obstruction if proper spatulation of the ureter, better hemostasis, watertight anastomosis and better reduction of the renal pelvis is achieved. So, stentless pyeloplasty in adult patients with primary pelviureteric junction obstruction looks promising and requires to be validated with larger number of patients.

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