

ORIGINAL ARTICLE**Comparison of laparoscopic and open pyeloplasty**

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ABSTRACT:

Background: Open pyeloplasty is a surgical procedure performed to correct a blockage or narrowing (stenosis) at the junction where the renal pelvis meets the ureter, known as the ureteropelvic junction (UPJ). The present study was conducted to evaluate comparison of laparoscopic and open pyeloplasty cases. **Materials & Methods:** 56 cases of pyeloplasty of both genders were divided into 2 groups of 28 each. Group I underwent open pyeloplasty and group II underwent laparoscopic pyeloplasty. Perioperative parameters such as operative time, analgesic use, hospital stay, and complication and success rates were compared. **Results:** Group I had 18 males and 10 females and group II had 12 males and 16 females. The mean operative time was 125.3 minutes in group I and 236.8 minutes in group II. Analgesic requirement was 612.4 mg in group I and 128.4 mg in group II. The mean duration of analgesic was 3.7 days in group I and 1.6 days in group II. The mean hospital stay was 7.5 days in group I and 3.1 days in group II. The difference was significant ($P < 0.05$). The success rate was 93% in group I and 98% in group II. The difference was significant ($P < 0.05$). **Conclusion:** Laparoscopic pyeloplasty has a minimal level of morbidity, short hospital stay, better cosmesis compared to open pyeloplasty.

Keywords: Open pyeloplasty, ureteropelvic junction, renal impairment

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INTRODUCTION

Open pyeloplasty is a surgical procedure performed to correct a blockage or narrowing (stenosis) at the junction where the renal pelvis meets the ureter, known as the ureteropelvic junction (UPJ).^{1,2} This blockage can lead to urinary flow obstruction and potentially cause hydronephrosis (dilation of the kidney) and renal impairment. During an open pyeloplasty, the surgeon makes an incision in the flank area (the side of the abdomen) to access the affected kidney and UPJ.³ The surgeon then removes the narrowed or obstructed segment of the ureter and renal pelvis and reconstructs the urinary tract to allow for proper drainage of urine from the kidney to the bladder. This may involve removing scar tissue, widening the narrowed segment, and reattaching the healthy parts of the ureter and renal pelvis.⁴

Open pyeloplasty is typically performed under general anesthesia and may require a hospital stay of a few days to monitor recovery and manage post-operative pain. Recovery time varies but may take several weeks before returning to normal activities.⁵

The open pyeloplasty procedure, first reported by Andersen and Hynes, is still the gold standard by which each novel treatment is evaluated. However, the morbidity linked to flank incision has prompted the creation of minimally invasive methods for UPJ

repair.⁶ The management of UPJ obstruction has changed over the past 20 years from open pyeloplasty to a variety of minimally invasive techniques, including laparoscopic pyeloplasty, endopyelotomy, acoustic catheter incision, and balloon dilatation.^{7,8} The present study was conducted to evaluate comparison of laparoscopic and open pyeloplasty cases.

MATERIALS & METHODS

The present study consisted of 56 cases of pyeloplasty of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 28 each. Group I underwent open pyeloplasty and group II underwent laparoscopic pyeloplasty. All laparoscopic pyeloplasties were performed transperitoneally. Standard open Anderson Hynes pyeloplasty, spiral flap or VY plasty was done depending on anatomic consideration. Patients were followed with DTPA scan at 3 months and IVP at 6 months. Perioperative parameters such as operative time, analgesic use, hospital stay, and complication and success rates were compared. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Method	open pyeloplasty	laparoscopic pyeloplasty
M:F	18:10	12:16

Table I shows that group I had 18 males and 10 females and group II had 12 males and 16 females.

Table II Comparison of parameters

Parameters	Group I	Group II	P value
Operating time (min)	125.3	236.8	0.01
Analgesic(mg)	612.4	128.4	0.01
Duration analgesic (days)	3.7	1.6	0.04
Hospital stay (days)	7.5	3.1	0.03

Table II, graph I shows that mean operative time was 125.3 minutes in group I and 236.8 minutes in group II. Analgesic requirement was 612.4 mg in group I and 128.4 mg in group II. The mean duration of analgesic was 3.7 days in group I and 1.6 days in group II. The mean hospital stay was 7.5 days in group I and 3.1 days in group II. The difference was significant (P< 0.05).

Graph I Comparison of parameters

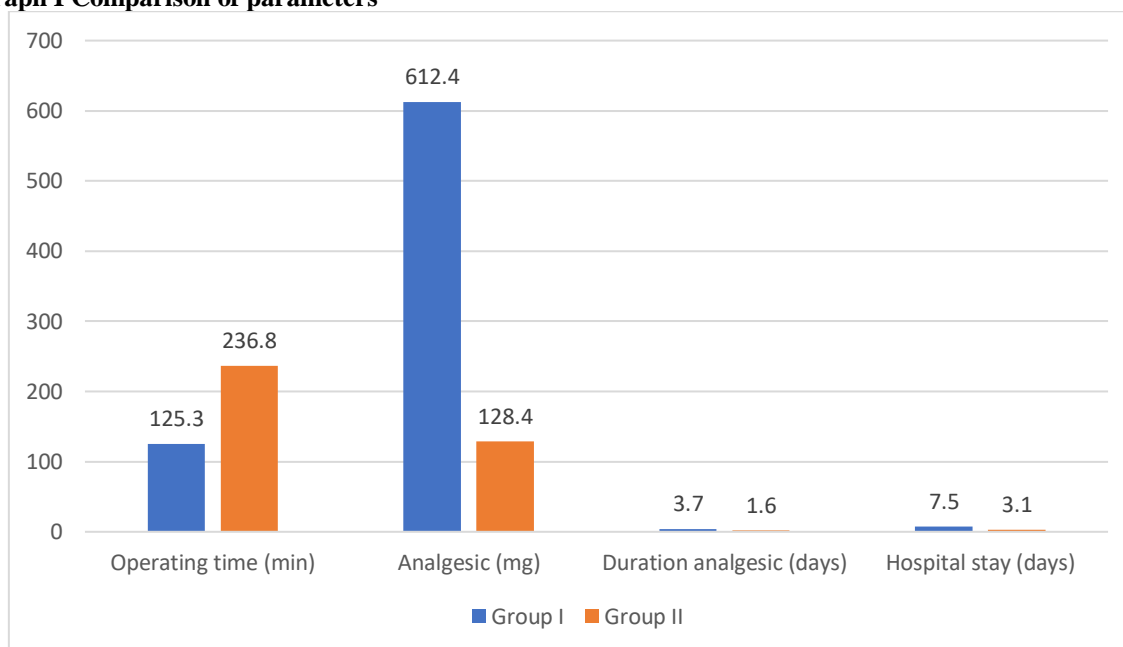


Table III Success rate in both groups

Success rate	%	P value
Group I	93%	0.05
Group II	98%	

Table III shows that the success rate was 93% in group I and 98% in group II. The difference was significant (P< 0.05).

DISCUSSION

While open pyeloplasty is effective in treating UPJ obstruction, less invasive techniques such as laparoscopic or robotic-assisted pyeloplasty have become more common in recent years.^{9,10} These minimally invasive approaches involve smaller incisions, less post-operative pain, and shorter recovery times compared to open surgery.^{11,12} However, open pyeloplasty remains a viable option for patients with complex or severe UPJ obstruction or in cases where other surgical approaches are not feasible.^{13,14,15} The present study was conducted to

evaluate comparison of laparoscopic and open pyeloplasty cases.

We found that group I had 18 males and 10 females and group II had 12 males and 16 females. Bansal et al¹⁶ examined the differences between open and laparoscopic pyeloplasty. 28 laparoscopic and 34 open pyeloplasty procedures were performed. Every laparoscopic pyeloplasty was carried out through the transperitoneal route. Depending on anatomic consideration, standard open Anderson Hynes pyeloplasty, spiral flap, or VY plasty were performed. After three months, the patients underwent a DTPA

scan, and six months later, an IVP. Comparisons were made between perioperative factors such as operation duration, analgesic usage, length of hospital stay, and success and complication rates. The LP group's mean overall surgical time with stent installation was 244.2 min (188–300 min), while the open group's was 122 min (100–140 min). The post-operative diclofenac dosage was much lower in the LP group (mean 107.14 mg) than in the open group (682.35 mg). Additionally, the LP group's duration of analgesic demand was much shorter. The mean post-operative hospital stay in the LP group was 8.29 days (7–11), which was notably shorter than the mean 3.14 days (2–7 days) of the open group. For UPJO repair, open pyeloplasty has been the gold standard, with success rates approaching 90%. Laparoscopic pyeloplasty has been more popular throughout the world as a minimally invasive option for repairing UPJO.

We found that mean operative time was 125.3 minutes in group I and 236.8 minutes in group II. Analgesic requirement was 612.4 mg in group I and 128.4 mg in group II. The mean duration of analgesic was 3.7 days in group I and 1.6 days in group II. The mean hospital stay was 7.5 days in group I and 3.1 days in group II. Zhang et al¹⁷ evaluated the clinical value of retroperitoneal laparoscopic dismembered pyeloplasty for ureteropelvic junction obstruction compared with open surgery. The clinical data of 56 patients who underwent retroperitoneal laparoscopic dismembered pyeloplasty were retrospectively compared with those of 40 patients who underwent open dismembered pyeloplasty through a retroperitoneal flank approach. Patient demographic data were similar between the 2 groups. In the laparoscopic group operative time (80 vs 120 minutes), estimated blood loss (10 vs 150 ml), recovery of intestinal function (1 vs 2 days), analgesic requirements (diclofenac sodium suppository) (75 vs 150 mg), incision length (3.5 vs 21 cm) and postoperative hospital stay (7 vs 9 days) were better than in the open group. No intraoperative complications occurred in either group. The incidence of postoperative complications and success rates were equivalent in the 2 groups.

We found that the success rate was 93% in group I and 98% in group II. Bonard et al¹⁸ conducted a study in which a total of 22 children with a mean age of 88 months underwent laparoscopic dismembered pyeloplasty via the retroperitoneal approach. An additional 17 children with a mean age of 103 months (range 37 to 206) underwent similar procedures via open surgery through a flank incision and compared operative time, the use of analgesics (acetaminophen or morphine derivatives) and hospital stay. The 2 groups were similar in mean age and weight at surgery. Mean operative time was significantly shorter in the open surgery vs the laparoscopy group (96 minutes, range 50 to 150 vs 219, range 140 to 310, $p < 0.0001$). Mean postoperative use of acetaminophen (1.9 vs 3.22 days, $p = 0.03$) and morphine derivatives (1.9 vs 3.06 days, p not significant) was less in the

laparoscopy group. Mean hospital stay was shorter in the laparoscopy group than in the open surgery group (2.4 days, range 1 to 5 vs 5, range 3 to 7, $p < 0.0001$). Mean follow-up was 21 (range 12 to 51) and 24 months (range 12 to 60) in the open and laparoscopy groups, respectively.

The limitation of the study is the small sample size.

CONCLUSION

Authors found that laparoscopic pyeloplasty has a minimal level of morbidity, short hospital stay, better cosmesis compared to open pyeloplasty.

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