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## Initial Experience on Laparoscopic Pyeloplasty in Persahabatan General Hospital, Jakarta: A Case Series

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### Abstract

**Introduction.** Untreated ureteropelvic junction obstruction would lead to infection and many other complications. The gold standard to treat this condition is pyeloplasty. Nowadays, laparoscopic pyeloplasty has emerged as a potential modality better than open pyeloplasty.

**Method.** Data retrospectively obtained from the medical records of UPJO patients at Persahabatan Hospital, Jakarta. The patient's age, gender, weight, and BMI noted. Duration of operation, intraoperative blood loss, and complications recorded as the intraoperative status. Length of hospital stay, pain score on the first post-operative day, time to do the daily activity, and return to work recorded as post-operative variables of this study.

**Results.** We included our ten patients who underwent laparoscopic pyeloplasty in our center. The mean of patient's age is  $40.3 \pm 17.1$  years with 70% male patients. The average body weight and body mass indexes are  $62.7 \pm 17.8$  kg and  $24.2 \pm 3.9$  kg/m<sup>2</sup>, respectively. Most of the procedures have been done in 225 minutes. Intraoperative blood loss is around 50 mL, with one patient loss his blood around 500 mL. Describing the post-operative outcomes, the average length of stay of the patients is  $8.6 \pm 1.6$  days, with an average visual analog score of  $3.5 \pm 1.1$  on the first post-operative day. The average time needed to recover to daily activity is around  $7.3 \pm 1.8$  days.

**Conclusion.** This study describes our initial experience on laparoscopic pyeloplasty in RSUP Persahabatan Jakarta. The data showed comparable results with other reviews. We need to bring further improvement to our findings along with our experience

**Keywords:** laparoscopic, pyeloplasty, UPJO

### Introduction

Left untreated obstruction of the ureteropelvic junction may lead to the development of urinary tract infection, urolithiasis, renal failure, and other symptoms like pain. The purpose of the intervention is to relieve symptoms and maintain or improve renal function.<sup>1</sup>

Pyeloplasty is the gold standard in the management of ureteropelvic junction obstruction. It can be done as open surgery, laparoscopic, or robot-assisted. With the advancement of laparoscopy technology, now it has been a comparable technique alongside open pyeloplasty.<sup>2</sup> Schussler first performed laparoscopic pyeloplasty (LP) in 1993.<sup>3</sup> There are many different techniques used for laparoscopy pyeloplasties, such as Anderson-Hynes dismembered pyeloplasty, fingerplasty, and YV plasty.<sup>4</sup>

In a different study, they identify that laparoscopic surgery has some flaws such as unergonomic, lack of range of motion because of the fixed position of the trocar, and outdated operating theatres environments. However, LP remains the first option because of its safety, efficacy, advantages like shorter LOS and lower morbidity, and cost-effectiveness compared with robot-assisted laparoscopic pyeloplasty.<sup>5</sup>

In Indonesia, there is only one health centre that has a robotic surgery system. Nonetheless, laparoscopic pyeloplasty is still

the best choice for the management of ureteropelvic obstruction in Indonesia. This study aims to report our initial experience with laparoscopic pyeloplasty.

### Method

Data retrospectively collected from the medical records of UPJO patients at Persahabatan General Hospital, Jakarta, from 2015-2018. The patient's age, gender, weight, and BMI noted. Duration of operation, intraoperative blood loss, and complications recorded as the intraoperative status. Length of hospital stay, pain score on the first postoperative day, time to do the daily activity, and return to work recorded as postoperative variables of this study. Transperitoneal LP offered patients with UPJO confirmed by renogram or CT scan or symptoms surgical correction. Indications for surgical intervention comprise impaired split renal function (<40%), poor drainage function after the administration of furosemide, increased anteroposterior diameter on ultrasound, and grade III and IV dilatation.

### Results

We included our ten patients who underwent laparoscopic pyeloplasty in our centre. From those 10 cases, there was one patient who had nephrostomy procedure previously in one period of hospital stay. The mean of patient's age was  $40.3 \pm 17.1$  years, and we had more male patients than female patients

with average body weight and body mass index are  $62.7 \pm 17.8$  kg and  $24.2 \pm 3.9$  kg/m<sup>2</sup> respectively (see table 1).

Table 1. Subjects characteristics

Parameter	n (%)
Age, years old (mean $\pm$ SD)	40.3 $\pm$ 17.1
Gender	
– Male	7 (70.0%)
– Female	3 (30.0%)
Body weight, kg (mean $\pm$ SD)	62.7 $\pm$ 17.8
Body mass index, kg/m <sup>2</sup> (mean $\pm$ SD)	24.2 $\pm$ 3.9

Table 2. Intraoperative and postoperative variables

Parameter	
Intraoperative variables (median (min-max))	
– Duration of operation (minutes)	225 (180-450)
– Intraoperative blood loss (mL)	50 (40-500)
– Complication	-
Postoperative variables (mean $\pm$ SD)	
– Length of hospital stays(days)	8.6 $\pm$ 1.6
– VAS on the first postoperative day	3.5 $\pm$ 1.1
– Back to work (days)	7.3 $\pm$ 1.8

In terms of postoperative outcomes, the average length of stay (LOS) of the We found that the data was not distributed regularly. The median duration of the procedures have done in 225 minutes, with the most prolonged duration of the operation is 450 minutes. Median of intraoperative blood loss was around 50 mL, with one patient loss his blood around 500 mL (see table 2).patients is  $8.6 \pm 1.6$  days, with most of the patients feel mild pain in average visual analogue score  $3.5 \pm 1.1$  on the first postoperative day. The average time needed to recover to daily activity was  $7.3 \pm 1.8$  days.

## Discussion

The average age of patients who underwent radical cystectomy was  $40.3 \pm 17.1$  years old, which is comparable with the into other studies with the mean age  $45.02 \pm 19.47$  years old.<sup>6,7</sup> Generally, laparoscopic pyeloplasty is done related to obstruction of the ureter, which leads to ureteropelvic junction obstruction. Many of the cases of UPJO happened in children.<sup>8</sup> The average BMI is  $24.2 \pm 3.9$  kg/m<sup>2</sup>, which shows that most of our patients are in the normal range.<sup>9</sup> These findings may be inappropriate to compare with the other study regarding body mass index, which shows the average BMI on  $23.34 \pm 3.14$  kg/m<sup>2</sup> (range, 17.69–30.59 kg/m<sup>2</sup>). Overweight or obesity is not a contraindication for the LP procedure. However, obesity could bring potential difficulties with surgery. Lindgren et al. found that with those difficulties, LP can perform as safely and effectively as in healthy weight children.<sup>10</sup>

The average operative time in this study was 225 minutes. Existing literature shows varied results, ranging from 96 minutes to 172 minutes.<sup>7,11</sup> Some studies described LP as a demanding procedure and require a longer time dan open

pyeloplasty. However, a meta-analysis compared LP with robotic pyeloplasty, described that robotic pyeloplasty needed shorter operative time, supported by the evidence where the learning curve in LP is a stepper. The learning curve considered significant, where a study reported a shortening of operative time in line with experience.<sup>12</sup> In contrast to the length of operation, the normal intraoperative bleeding in this study was 50 ml, slightly more bleeding than another study with 20 mL for the average blood loss.<sup>11</sup> Our data shows a wide range of intraoperative bleeding volume, as the first case of LP in our centre, reached 500 mL of intraoperative bleeding.

Along with the increase in LP procedures performed in our centre, it expected that the quality and duration of LP improves. The first-day pain post-LP procedure assessed with VAS revealed an average value of 3.5 and did not need any additional analgesics.

The average length of stay in the hospital was 8.6 days. These are comparable to other studies with a more experienced team that could shorten the length of stay to 1.1-7.3 days.<sup>6,12,13</sup> We have not found any complications related to this procedure. Moreover, the average time needed for a patient to go back to his daily activities is 7.3 days. However, most of the literature assesses the length of follow up.

A study comparing RAP, LP, and OP demonstrates that there are no significant differences between RAP, LP, and OP in terms of overall success rate, re-operation rate, conversion rate, postoperative complications, and urinary leakage.<sup>8</sup> Laparoscopy pyeloplasty has been preferable than open pyeloplasty because of shorter length of stay, better cosmetic, less pain, less blood loss, shorter recovery time, shorter time needed to go back to daily activity, with comparable success rate with open pyeloplasty. Open pyeloplasty is related to higher pain score, and longer recovery time. Regarding this, LP has the potential to replace open pyeloplasty.<sup>13</sup>

Even though LP has a high success rate, there will always be some possibilities of failure. Factors related to the inability of laparoscopic pyeloplasty, including anatomical factors and techniques used. To ensure a successful pyeloplasty, such as careful tissue handling, tension-free anastomosis, and preservation of blood supply of ureter and pelvis, must be cautious. The failure of laparoscopic pyeloplasty could manifest as fever, pain, or worsening hydronephrosis. For the late failure, the symptom can occur two or three years after the surgery. Postoperative complications like haematuria, postoperative pain, urinary tract infection, or urine leakage could also occur occur.<sup>14</sup>

## Conclusion

This study describes our initial experience on laparoscopic pyeloplasty in Persahabatan General Hospital, Jakarta. The data showed comparable results with other reviews. We need to bring further improvement to our findings along with our experience.

## Disclosure

The author(s) declare to have no conflict of interest to disclose

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