

## Case Report

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# One Anaesthesia, One Surgery: Synchronous Bilateral Robot-Assisted Laparoscopic Pyeloplasty in a 1.5-Month-Old Infant

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## ABSTRACT

**Background:**

Robot-assisted laparoscopic pyeloplasty (RALP) is increasingly being utilized for pediatric ureteropelvic junction obstruction (UPJO). It is reported to offer outcomes comparable to open surgery. However, its application in infants is technically challenging due to limited intraperitoneal space and potential instrument collision. In cases of bilateral UPJO, synchronous bilateral repair provides advantages of reduced anesthesia exposure and shorter hospital stay, but its use in very young infants remains scarcely reported.

**Case Report:**

We report the case of a 1.5-month-old male with antenatally detected bilateral hydronephrosis. Postnatal imaging and renography confirmed obstructed bilateral UPJO with suboptimal renal function. Following recurrent episodes of urinary tract infection he underwent synchronous bilateral RALP using the da Vinci Si system.

**Conclusion:**

This case demonstrates the technical feasibility and safety of synchronous bilateral RALP in very young infants. Benefits of single-stage robotic approach reduces anesthesia exposure, hospital stay and recovery time as compared to staged repairs.

**Keywords:** *Fetal Hydronephrosis, Minimally Invasive Surgical Procedures, Pyeloplasty, Ureteropelvic Junction Obstruction.*

**INTRODUCTION**

Robot-assisted laparoscopic pyeloplasty (RALP) has become a leading treatment for pediatric ureteropelvic junction obstruction (UPJO).<sup>1</sup> Its adoption in infants, however, has been slower due to technical challenges like restricted working space and potential instrument collision.<sup>2</sup> Despite these concerns, expanding surgical experience is progressively validating the safety and feasibility of RALP in infants.<sup>3-6</sup>

Bilateral UPJO, affects about 10-40% of patients and was traditionally managed with staged pyeloplasty.<sup>7</sup> While synchronous bilateral pyeloplasty has emerged as a safe single-stage alternative in pediatric age group.<sup>8-10</sup> However to our knowledge, this is the first reported case of a successful synchronous bilateral robotic pyeloplasty in an infant as young as 1.5 months old. We present this case to demonstrate the feasibility and safety of the procedure in this patient population.

**CASE REPORT:-**

A 1.5-month-old male presented with history of antenatally detected bilateral hydronephrosis. Neonatal ultrasound revealed right renal pelvis AP diameter 26mm with mild calyceal dilatation and altered echotexture; left renal pelvis AP diameter was 15mm. (Figure 1)

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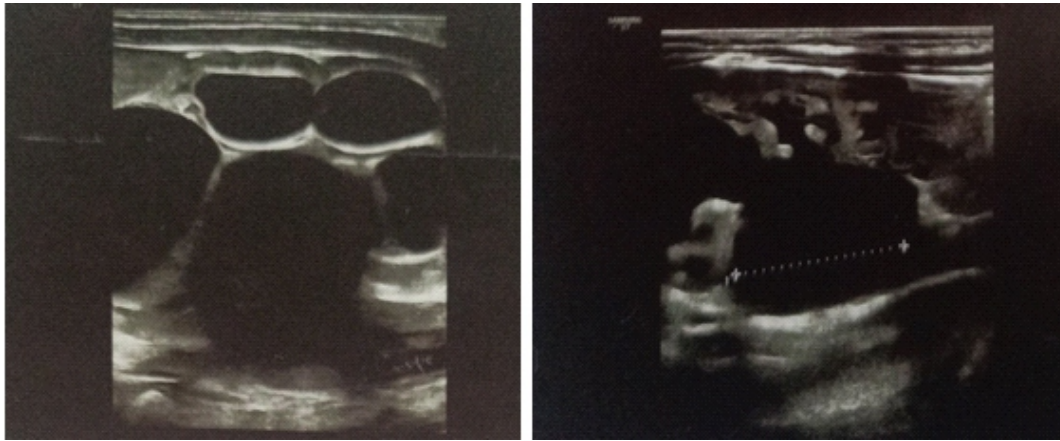
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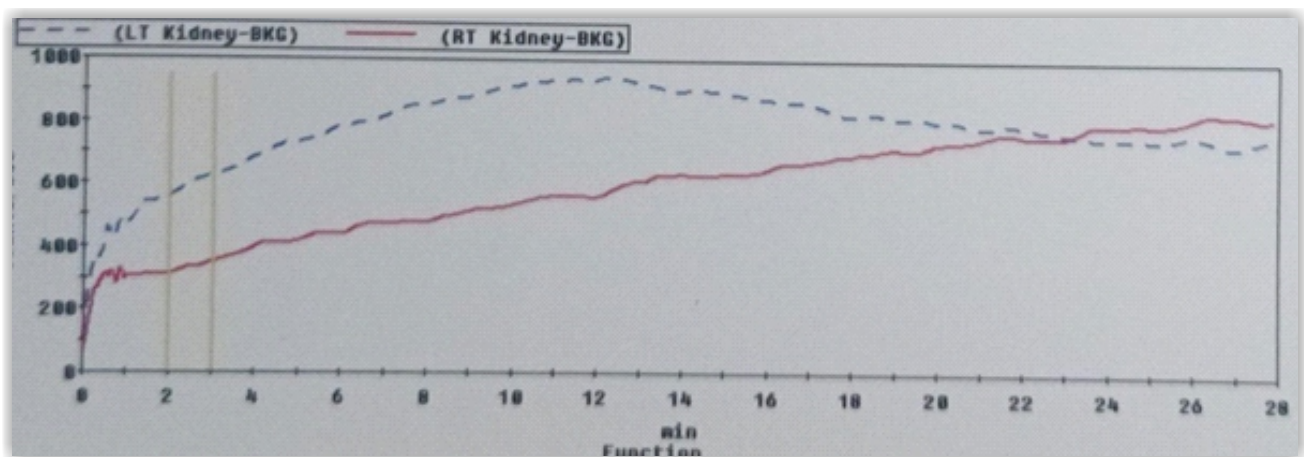
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*Figure 1: Postnatal Ultrasound Showing Bilateral Dilated Pelvicalyceal System With Thinning Of Renal Cortex*

He experienced two episodes of urinary tract infection (UTI) at 26 days and 1 month of age, while he was on continuous antibiotic prophylaxis. Subsequent ultrasound showed worsening hydronephrosis: right renal pelvis AP diameter was

4.5 cm and left renal pelvis AP diameter was 2.5cm. Ethylenedicycysteine (EC) scan demonstrated sub-optimally functioning, obstructed bilateral hydronephrosis, with rising renogram curves for both kidneys (**Figure 2**).

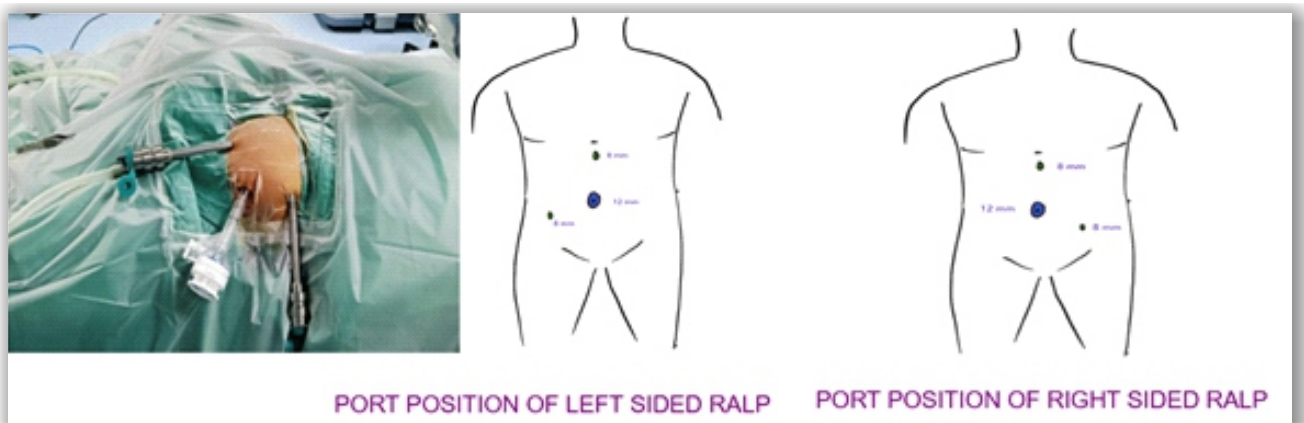


*Figure 2: Renogram Showing Obstructed Flow Pattern*

MCUG was suggestive of normal bladder outline without any reflux. In view of breakthrough UTI, he was planned for bilateral RALP. Preoperatively, the patient was maintained NPO for 6 hours, and rectal suppository was administered the previous evening. Following anesthetic induction, a nasogastric tube and Foley catheter were inserted.

## Positioning and port placement for right pyeloplasty:

The patient was initially placed in a right flank-up position and secured. A 12 mm camera port was inserted at the superior umbilical border via a modified Hassons technique. Two other 8 mm ports were inserted, one at the midline about 2 cm below the xiphoid process and the other at right lower quadrant in right midclavicular line (Figure 3).



*Figure 3: Positioning and port placement for Bilateral pyeloplasty*



## Synchronous Bilateral Robot-Assisted Laparoscopic Pyeloplasty

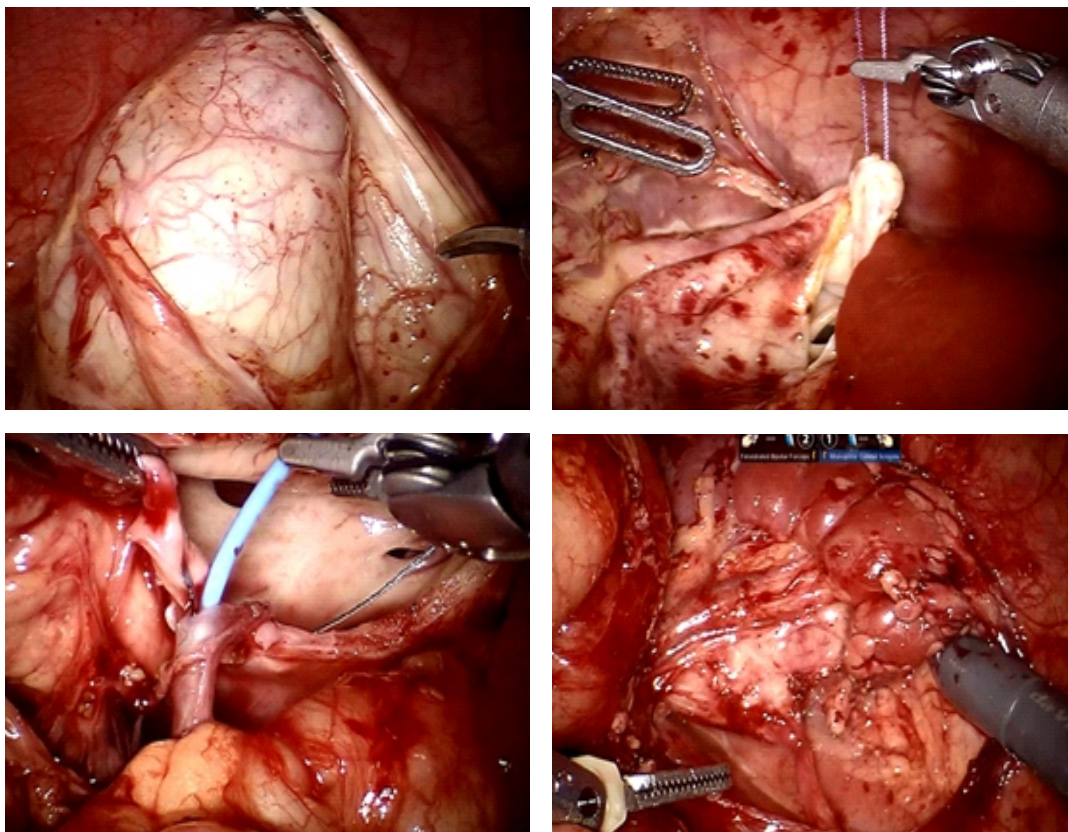
The trocars were secured to abdominal wall using 1-0 silk. Da Vinci Si robotic system was then docked. Fenestrated bipolar and monopolar curved scissors were introduced in left and right robotic arm respectively.

### Operative technique of right pyeloplasty

The right colon was medialized following incision of white line of Toldt. The anterior lamina of Gerota's fascia was then incised, exposing dilated right renal pelvis, UPJ and the right ureter. A hitch stitch was placed to stabilize the renal pelvis. The renal pelvis was incised proximal to the ureteropelvic junction (UPJ), and the ureter was dismembered. Stenosed ureteric opening was identified. Stenosed part was excised and healthy ureter seen distally. The ureter was spatulated, and the posterior layer of the anastomosis was created using a V-Loc 4-0 suture. A 3/10 French double-J (DJ) stent was placed

antegradely with robotic needle driver. The anterior layer of the anastomosis was then completed with another V-Loc 4-0 suture. We had not placed any additional assistant port. Suture and DJ stent were placed through 8 mm epigastric port. No guidewire was utilized for DJ stent placement.

Following successful right-sided pyeloplasty, the 8 mm trocar at the right midclavicular line was removed, and the abdominal defect was closed. The remaining ports were covered with sterile towels to maintain sterility during patient repositioning. The robot was shifted to the opposite side. Patient was placed in left flank up position and secured. Pneumoperitoneum was re-established, and an 8 mm trocar was inserted into the left lower quadrant along the left midclavicular line. The surgical steps for left pyeloplasty were similar to that performed on right.



*Figure 4:- Clockwise from left upper corner Dilated Left Renal Pelvis with narrow UPJ, Hitch Suture taken, Dilated Left Renal Pelvis seen and Antegrade DJ stent Placement done.*

Bilateral PUJO posed a different challenge. They were corrected with staged pyeloplasties traditionally. This was done to avoid prolonged anesthesia and the feared complication of bilateral obstruction. This practice however has been challenged by evidence showing synchronous bilateral procedures as safe and beneficial. Studies have shown that a single-stage approach, whether open or laparoscopic, reduces hospital stays, requires only a single anesthetic exposure, and lessens postoperative pain compared to a staged approach.<sup>8,9</sup>

RALP is suitable for bilateral pyeloplasty, as it overcomes the difficulties of laparoscopic intracorporeal suturing and dissection with its magnified stereoscopic vision and endowrist technology, thereby reducing operative time. This case report contributes to the literature by demonstrating a synchronous bilateral RALP in a 1.5-month-old infant, thereby advancing the findings of Freilich et al., who had

previously confirmed the feasibility of procedure in older children.<sup>10</sup>

In this case, we addressed the limited working space by repositioning the patient intraoperatively and utilizing bariatric-length trocars to prevent the clashing of robotic arms. Furthermore, we shortened the overall anesthesia time by placing the DJ stent antegradely through a port, which obviated the need for patient repositioning into a lithotomy position for retrograde placement.

While this is a single case report and further studies with larger cohorts are necessary to establish long-term outcomes, our experience suggests that synchronous bilateral robotic pyeloplasty is a technically feasible and safe procedure even in very young infants. Bilateral PUJO posed a different challenge. They were corrected with staged pyeloplasties traditionally. This was done to avoid prolonged anesthesia and

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## CONCLUSION :

This case demonstrates the feasibility and safety of synchronous bilateral robot-assisted laparoscopic pyeloplasty (RALP) for the management of bilateral ureteropelvic junction obstruction (UPJO) in infants. Our experience supports its consideration as a viable, single-session, minimally invasive alternative to staged or open surgical approaches.

**Conflict Of Interest : None**

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