

Case Report

ROBOT-ASSISTED ANDERSON-HYNES PYELOPLASTY FOR RIGHT PELVIURETERIC JUNCTION OBSTRUCTION IN A PATIENT WITH POST-POLIO KYPHOSCOLIOSIS: A CASE REPORT

Devendra Sharma¹, Pratik Garg², Gaurav Jalendra³, Nikhil Sharma⁴

¹Director, Department of Urology and Renal Transplant and Robotic Surgery, CK Birla (RBH), Jaipur, Rajasthan, India.

²Associate Consultant, Urology and Renal Transplant, CK Birla (RBH), Jaipur, Rajasthan, India.

^{3,4}Resident DNB Urology, Department of Urology, CK Birla (RBH), Jaipur, Rajasthan, India.

Received : 22/06/2026
Received in revised form : 10/08/2026
Accepted : 25/08/2026

Corresponding Author:

Dr. Devendra Sharma,
Director, Department of Urology and
Renal Transplant and Robotic Surgery,
CK Birla (RBH), Jaipur, Rajasthan,
India.
Email: lakheri@gmail.com

DOI: 10.70034/ijmedph.2026.3.619

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (3); 3981-3986

ABSTRACT

Background: Pelviureteric junction (PUJ) obstruction is a common cause of upper urinary tract obstruction, and robot-assisted laparoscopic pyeloplasty (RALP) has emerged as the gold-standard reconstructive approach. Patients with pre-existing skeletal deformities such as post-polio kyphoscoliosis pose unique intraoperative challenges related to positioning, port placement and anatomical distortion.

Case Presentation: A 51-year-old female (A.S.), a known case of poliomyelitis with residual kyphoscoliosis and bilateral total knee replacement, presented with occasional urinary urgency. Contrast-enhanced computed tomography (CECT) urography demonstrated moderate right pelvicalyceal dilatation with abrupt narrowing at the PUJ and a 5-mm lower-calyceal calculus. Tc-99m DTPA renal scintigraphy confirmed a hydronephrotic right kidney with impaired perfusion, reduced differential function (43%) and an obstructive drainage pattern. The patient underwent right retrograde pyelography followed by robot-assisted Anderson-Hynes dismembered pyeloplasty over a double-J (DJ) stent using a six-port transperitoneal technique.

Outcome: The procedure was completed successfully without conversion. The postoperative period was uneventful. The urethral catheter and pelvic drain were removed on postoperative day 2 and the patient was discharged in stable condition with a plan for DJ stent removal at four weeks.

Conclusion: Robot-assisted pyeloplasty is safe and feasible in patients with severe skeletal deformity when meticulous attention is paid to positioning and port geometry. This report highlights the technical adaptations required and reinforces the role of robotics in reconstructive urology for anatomically complex patients.

Keywords: Pelviureteric junction obstruction; Robot-assisted pyeloplasty; Anderson-Hynes; Kyphoscoliosis; Poliomyelitis; Hydronephrosis.

INTRODUCTION

Pelviureteric junction (PUJ) obstruction is defined as a restriction of urinary flow from the renal pelvis into the ureter, resulting in progressive dilatation of the collecting system and, if untreated, loss of renal function. The condition may be congenital or acquired, with an aberrant lower-pole vessel, intrinsic stenosis or high ureteric insertion being the

most commonly identified aetiologies. Adults often present with vague flank discomfort, recurrent urinary tract infections, urolithiasis or, as in the present case, incidentally on imaging performed for unrelated urinary symptoms.

The Anderson-Hynes dismembered pyeloplasty, first described in 1949, remains the reference standard for the surgical management of PUJ obstruction because it addresses both the stenotic

segment and the redundant pelvis while allowing transposition of a crossing vessel where required. Over the past two decades, minimally invasive approaches — first laparoscopic and subsequently robot-assisted — have progressively supplanted open surgery, offering equivalent success rates (>95%) with reduced perioperative morbidity, shorter hospital stay and superior cosmesis.

Robot-assisted laparoscopic pyeloplasty (RALP) is particularly advantageous during the reconstructive phase, where the seven-degree-of-freedom articulation, tremor filtration and three-dimensional stereoscopic vision facilitate precise intracorporeal suturing of the ureteropelvic anastomosis. Nevertheless, patients with pre-existing spinal deformities such as kyphoscoliosis introduce anatomical and ergonomic constraints that may not be encountered in standard cases: altered surface landmarks, distorted retroperitoneal anatomy, restricted lateral decubitus positioning, and constrained trocar triangulation. Published experience of RALP in patients with severe post-polio skeletal deformity is scarce.

We report the case of a 51-year-old woman with post-polio kyphoscoliosis and bilateral total knee

arthroplasty who underwent successful robot-assisted right dismembered pyeloplasty, and we discuss the technical modifications employed.

2. Case Presentation

2.1 Patient Profile and Presenting Complaint

A 51-year-old female (patient initials A.S.; UHID R000415918) presented to the outpatient department with a history of occasional urinary urgency. She had been evaluated at an outside facility where imaging incidentally revealed a right PUJ obstruction, for which she was referred for definitive management. There was no history of gross haematuria, flank pain, fever, or lower urinary tract symptoms other than urgency.

2.2 Past Medical, Surgical and Personal History

The patient was a known case of childhood poliomyelitis with residual kyphoscoliosis. She had previously undergone bilateral total knee replacement and corrective leg surgery for post-polio sequelae in the year 2000. There was no significant personal or family history. She reported a documented allergy to ofloxacin, manifesting as gastric symptoms. A summary of her clinical profile is provided in Table 1.

Table 1: Baseline patient profile

Parameter	Details
Patient identifier	A.S. (UHID R000415918)
Age / Sex	51 years / Female
Presenting complaint	Occasional urinary urgency; incidental finding of right PUJ obstruction on imaging
Comorbidities	Post-polio residual paralysis; kyphoscoliosis
Past surgical history	Bilateral total knee replacement (2000); corrective leg surgery for polio (2000)
Known drug allergy	Ofloxacin (gastric intolerance)
Family history	Not significant

2.3 Laboratory Investigations

Preoperative haematological and biochemical parameters were within normal limits. Viral markers were non-reactive and a coagulation screen was normal. A resting 12-lead electrocardiogram demonstrated normal sinus rhythm and two-

dimensional echocardiography documented a left ventricular ejection fraction of approximately 60% with no regional wall-motion abnormality and preserved diastolic function. The complete laboratory profile is summarised in Table 2.

Table 2: Preoperative laboratory investigations

Investigation	Result	Reference range
Haemoglobin	13.60 g/dL	12.0 – 15.5
Total leucocyte count	7,310 / μ L	4,000 – 11,000
Platelet count	2,18,000 / μ L	1,50,000 – 4,50,000
Random blood sugar	92.69 mg/dL	70 – 140
Serum creatinine	0.39 mg/dL	0.6 – 1.1
Serum sodium	142 mmol/L	135 – 145
Serum potassium	4.13 mmol/L	3.5 – 5.1
Serum chloride	105.9 mmol/L	96 – 107
PT / INR	13.1 s / 1.14	11 – 14 / 0.9 – 1.2
HIV 1 & 2 antibodies	0.489 (Non-reactive)	< 1.00
HBsAg	0.784 (Non-reactive)	< 1.00

2.4 Imaging

Contrast-enhanced CT urography demonstrated moderate dilatation of the right renal pelvicalyceal system with abrupt narrowing at the pelviureteric junction, no visible calculus at the PUJ itself, and a 5-mm lower-calyceal calculus (Hounsfield unit

~1490), consistent with intrinsic PUJ obstruction (Figure 1). The left kidney was unremarkable.



Figure 1: Delayed-phase axial CT urography images demonstrating a moderately dilated right renal pelvis and calyces with abrupt narrowing at the pelviureteric junction. A small lower-calyceal calculus is also seen. The left kidney and collecting system appear normal

Tc-99m DTPA diuretic renal scintigraphy showed a differential renal function of 57% (left) and 43% (right), with a total glomerular filtration rate of approximately 71 mL/min. The right kidney was hydronephrotic with impaired perfusion, reduced cortical function, sluggish drainage and an impaired diuretic response — features suggestive of outflow obstruction at the PUJ (Figure 2). Ultrasonography documented a pre-void bladder

volume of ~150 mL with a post-void residual of ~14 mL.

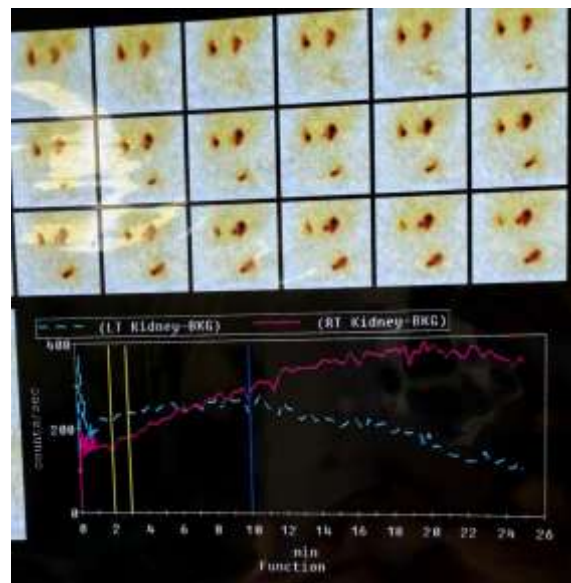


Figure 2: Tc-99m DTPA diuretic renogram. The time-activity curve of the right kidney (solid line) demonstrates a rising pattern with an impaired diuretic response and prolonged parenchymal retention, whereas the left kidney (dashed line) shows a normal excretory pattern

2.5 Diagnosis

Table 3: Diagnostic summary

Parameter	Finding
Final diagnosis	Right pelviureteric junction (PUJ) obstruction with kyphoscoliosis
ICD-10 code	N13.0
Right renal differential function	43% (GFR $\approx$ 30 mL/min)
Left renal differential function	57% (GFR $\approx$ 41 mL/min)
Total GFR	$\approx$ 71 mL/min
Associated stone disease	5-mm right lower-calyceal calculus

3. Surgical Management

3.1 Preoperative Planning

After multidisciplinary preoperative assessment — including anaesthetic evaluation in view of kyphoscoliosis — the patient was counselled regarding the diagnosis, surgical options, expected outcomes and the specific risks associated with her skeletal deformity. Written informed consent was

obtained for robot-assisted right dismembered pyeloplasty with retrograde pyelography and DJ stent placement.

3.2 Operative Procedure

The procedure was performed on 31 July 2026 under general anaesthesia. The operative details are summarised in Table 4.

Table 4: Operative details

Step	Detail
Date of surgery	31 July 2026
Anaesthesia	General anaesthesia
Positioning (Step 1)	Lithotomy for cystoscopy and retrograde pyelography
Cystoscopy / RGP	Right ureteric catheter placed; right retrograde pyelogram confirmed hydronephrotic kidney with PUJ obstruction
Foley catheter	Placed per urethra
Positioning (Step 2)	Right side up (modified lateral decubitus)
Port configuration	6 ports (2 $\times$ 5 mm + 4 $\times$ 8 mm) — transperitoneal
Exposure	Mobilisation of the ascending colon and duodenum (Kocher manoeuvre)
Reconstruction	Renal hilar dissection; Anderson–Hynes dismembered pyeloplasty over an indwelling DJ stent
Drain	Pelvic drain placed; all ports closed



Figure 3: Intraoperative photograph showing the transperitoneal robotic port configuration. Six trocars (two 5-mm and four 8-mm) were placed to accommodate the patient's altered surface anatomy secondary to kyphoscoliosis

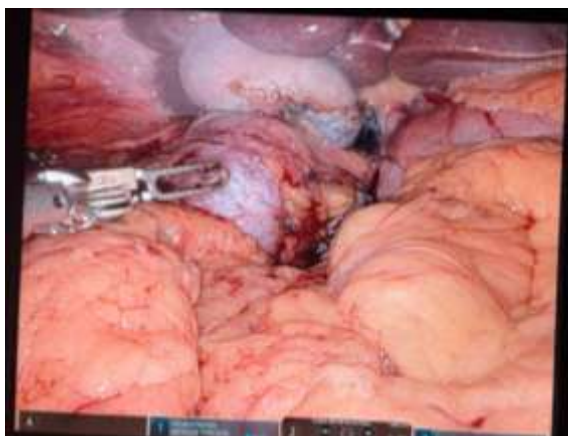


Figure 4: Endoscopic robotic view during dissection of the pelviureteric junction. The dilated renal pelvis is retracted with a fenestrated bipolar forceps, exposing the stenotic segment prior to dismemberment.

for open conversion or blood transfusion. The patient was transferred to the ward on the same day and mobilised on the first postoperative day. The urethral catheter and pelvic drain were both removed on 2 August 2026 (postoperative day 2). The patient voided spontaneously without difficulty and was discharged in stable condition on the same day, with instructions for follow-up.

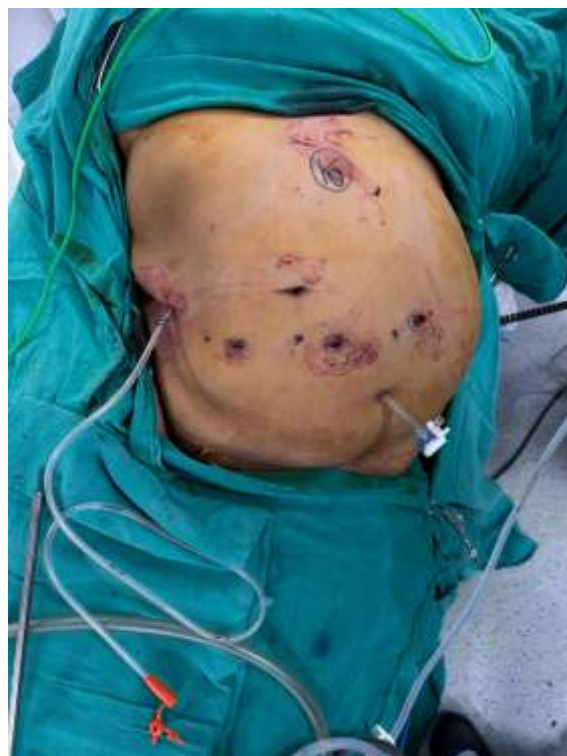


Figure 5: Immediate postoperative view of the abdomen at the end of the procedure, showing the port-site incisions and the pelvic drain in situ.

4. Postoperative Course and Outcome

The intraoperative and immediate postoperative periods were uneventful. There was no requirement

4.1 Discharge Medication

The patient was discharged on the medication regimen detailed in Table 5. Ofloxacin was specifically avoided given the documented allergy.

Table 5: Medication advised on discharge

#	Medication	Dose	Frequency & Duration	Route
1	Augmentin Duo	625 mg	Twice daily × 5 days	Oral
2	Rabirise L	1 cap	Once daily on empty stomach × 7 days	Oral
3	Ultracet	1 tab	Twice daily × 2 days, then SOS for pain	Oral
4	Syp. Lacti hep	3 tsf	At bedtime × 5 days, then SOS for constipation	Oral
5	Co 10 Forte	1 tab	At bedtime × 15 days	Oral
6	Urimax	0.4 mg	At bedtime × 30 days	Oral
7	Uristat	100 mg	At bedtime × 30 days	Oral

4.2 Follow-up Plan

The patient was scheduled for suture removal on postoperative day 10 (10 August 2026) and elective DJ stent removal at four weeks (1 September 2026). Long-term surveillance with repeat renal ultrasonography and a diuretic renogram at 3–6

months following stent removal was planned to confirm resolution of obstruction and stabilisation or improvement of split renal function.

DISCUSSION

PUJ obstruction accounts for a substantial proportion of adult reconstructive urology practice. When the mechanism is intrinsic, as in the present case, the pathological hallmark is a segment of adynamic, aperistaltic ureter that fails to transmit the urinary bolus, producing progressive proximal dilatation. Indications for surgical intervention include the presence of symptoms attributable to obstruction, deterioration of split renal function, recurrent stones or infection, and progressive hydronephrosis on serial imaging.

Anderson–Hynes dismembered pyeloplasty addresses the pathophysiology by excising the diseased segment and creating a dependent, spatulated, tension-free anastomosis over an indwelling stent. Reported success rates consistently exceed 90–95% across open, laparoscopic and robotic series, with robotic reconstruction associated with a shorter learning curve compared with pure laparoscopy and reduced operative morbidity compared with open surgery.

The novelty of the present case lies in the coexistence of severe post-polio kyphoscoliosis and bilateral total knee arthroplasty. Kyphoscoliosis introduces several considerations relevant to robotic urological surgery:

- **Positioning:** the rigid spinal curvature limits standard lateral decubitus positioning and increases the risk of pressure injury; additional padding and careful axilla, hip and knee support are essential.
- **Surface landmarks:** the umbilicus, costal margin and iliac crest may be displaced, mandating individualised port planning rather than the use of standard templates.
- **Working space:** thoracolumbar deformity can compress the retroperitoneum and alter the relationship of the kidney to the liver, colon and duodenum.
- **Anaesthetic implications:** restrictive ventilatory physiology, difficult neuraxial access and the need for careful pneumoperitoneum management should be anticipated.
- **Prior total knee replacement:** lithotomy positioning for the initial cystoscopy and retrograde pyelogram requires additional caution to avoid stress on the prosthetic joints.

In our patient these challenges were mitigated by (i) a two-stage positioning strategy — lithotomy for the ureteroscopic component followed by a modified lateral decubitus configuration for the robotic reconstruction; (ii) tailoring of the six-port geometry (2 × 5 mm plus 4 × 8 mm ports) to the patient's displaced landmarks; and (iii) generous mobilisation of the ascending colon and duodenum to compensate for the retroperitoneal distortion imposed by the spinal deformity.

The intraoperative decision to perform pyeloplasty without concomitant treatment of the 5-mm lower-calyceal calculus is defensible, given that the stone was small, asymptomatic and located in a dependent calyx. A staged approach avoids prolongation of an already complex reconstructive procedure and preserves the option of subsequent flexible ureteroscopy or shockwave lithotripsy if required. Postoperative follow-up imaging will guide any further intervention.

Reported outcomes of RALP in the general adult population show a mean operative time of 130–200 minutes, minimal blood loss, a hospital stay of 2–3 days, and success rates of 95–98% at intermediate follow-up. Our patient's uneventful two-day hospital stay is consistent with the published literature and supports the applicability of robotic reconstruction even in the presence of substantial skeletal deformity.

CONCLUSION

Robot-assisted Anderson–Hynes dismembered pyeloplasty is a safe and effective treatment for PUJ obstruction and can be successfully performed in patients with complex skeletal deformity such as post-polio kyphoscoliosis. The key to success lies in individualised preoperative planning, meticulous positioning, patient-specific port geometry and adequate visceral mobilisation. To the best of our knowledge, published experience in this specific patient subgroup is limited, and the present case adds to the small body of evidence supporting robotic reconstructive urology in anatomically challenging patients.

Consent

Written informed consent was obtained from the patient for the publication of this case report and the accompanying clinical images. Every effort has been made to preserve patient confidentiality; only the initials have been used and no directly identifying features are shown in the figures.

Declarations

Conflicts of interest: The authors declare that they have no competing interests.

Funding: No specific funding was received for this work.

Author contributions: All listed authors contributed to the surgical care of the patient, drafting of the manuscript and final approval of the submitted version.

REFERENCES

1. Anderson JC, Hynes W. Retrocaval ureter: a case diagnosed pre-operatively and treated successfully by a plastic operation. *Br J Urol.* 1949;21(3):209–14.
2. Schuessler WW, Grune MT, Tecuanhuey LV, Preminger GM. Laparoscopic dismembered pyeloplasty. *J Urol.* 1993;150(6):1795–9.
3. Gettman MT, Neururer R, Bartsch G, Peschel R, Anderson–Hynes dismembered pyeloplasty performed using the da Vinci robotic system. *Urology.* 2002;60(3):509–13.

4. Autorino R, Eden C, El-Ghoneimi A, et al. Robot-assisted and laparoscopic repair of ureteropelvic junction obstruction: a systematic review and meta-analysis. *Eur Urol.* 2014;65(2):430–52.
5. Silay MS, Spinoit AF, Bogaert G, et al. Robot-assisted vs laparoscopic pyeloplasty in children: preliminary results of a multi-institutional analysis. *J Pediatr Urol.* 2016;12(4):229.e1–7.
6. Sivaraman A, Leveillee RJ, Patel MB, et al. Robot-assisted laparoscopic dismembered pyeloplasty for ureteropelvic junction obstruction: a multi-institutional experience. *Urology.* 2012;79(2):351–5.
7. European Association of Urology. EAU Guidelines on Urolithiasis and Reconstructive Urology (most recent edition). Available at: <https://uroweb.org/guidelines>.