

## Robotic-assisted laparoscopic pyeloplasty with the use of the Contour™ stent: description of the technique and analysis of outcomes after the first 30 cases

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**Introduction** We present a technical variation of robot-assisted pyeloplasty (RAP) using the Contour™ stent that allows a minimal incision of the retroperitoneum.

**Material and methods** The main difference from the standard robot-assisted pyeloplasty (RAP) is the preventive retrograde insertion of a Contour™ stent, which is a single J stent subsequently easily convertible in a double J stent.

**Results** The mean operative time was 141.2 minutes. Blood losses were negligible, median length of stay was 4 days.

**Conclusions** The use of a Contour™ stent showed to be a safe and feasible technical variation while performing a RAP.

**Key Words:** robotic surgery ◊ ureteropelvic junction obstruction ◊ robotic pyeloplasty ◊ dismembered pyeloplasty

## INTRODUCTION

Robotic-assisted Anderson-Hynes pyeloplasty (RAP) is becoming the preferred technique for the surgical management of pelviureteric junction obstruction (PUJO) [1, 2], due to reduced postoperative pain, shorter hospital stays, faster convalescence and less scarring when compared to the open technique [3–6]. Two of the main critical steps of the technique are represented by the individuation of the exact point of the stenosis, especially for the minimally-invasive transmesocolic and supramesocolic approaches, as well as the insertion of the double J stent after the incision of the ureteropelvic junction.

We aim to present a technical variation using the Contour™ stent that might be helpful in both previ-

ously described stages of the surgery and to demonstrate the outcomes of our first 30 patients.

## MATERIAL AND METHODS

We prospectively collected data of all consecutive adult patients undergoing robotic pyeloplasty according to Anderson-Hynes with the use of a Contour™ stent at our institution from April 2015 to May 2018. All procedures were performed by a single surgeon (FG) using the da Vinci Si robotic system. We performed a minimally-invasive transmesocolic approach for the left side PUJO and a supramesocolic approach for the right ones. Indications for surgical correction included: persistent

or worsening radiographic hydronephrosis, pain, recurrent urinary tract infections (UTIs), stones or radiographic signs of obstruction. The preoperative assessment included serum creatinine, urinalysis, sonography of the urinary tract, abdominal computed tomography (CT) and intravenous pyelogram (IVP) and a Mag3 (Mercaptuacetyltriglycine) renogram. The follow-up included serum creatinine, abdominal ultrasound and a renogram 4 months following surgery.

The main difference from the standard RAP is the preventive retrograde insertion of a Contour™ ureteric stent, which is a ureteric single J stent subsequently easily convertible in a double J stent. The insertion is carried out with the patient in lithotomic position and under fluoroscopy. Afterwards, the patient is turned to a flank position and a standard RAP is performed. The main advantage of its use is the possibility to inflate and deflate the renal pelvis with saline solution, allowing for clearer anatomical identification of the pelvic ureteric junction (PUJ) and avoiding possible ureteric damages due to a traumatic anterograde insertion of a double J ureteric stent. In the second post-operative day the Contour™ is then easily converted into a double J and its correct position double checked through an abdominal radiograph.

## RESULTS

Mean ( $\pm$ SD) age at surgery was  $48.2 \pm 15.3$  years, mean ( $\pm$ SD) BMI was  $22.9 \pm 2.6$ , while gender was equally represented with 15 males and 15 females. Median Charlson comorbidity score was 1 (0–1), while the median American Society of Anesthesiologists (ASA) classification was 2 (1–2). Twenty patients had a right sided PUJO, while 10 had a left sided one. The main intra- and post-operative outcomes are summarized in Table 1. Overall, six patients had a postoperative complication: five had a Clavien-Dindo grade II and one patient had a grade IIIa. In particular, all grade II complications were patients who developed hyperpyrexia or fever after surgery. The patient with a Clavien-Dindo IIIa had a displacement of the single J stent, developed hydronephrosis and underwent the temporary insertion of a percutaneous nephrostomy. At 4-months follow-up, 90% of patients showed a success of the procedure in terms of improved glomerular filtration rate (GFR) and/or absence of the PUJO and/or symptoms.

**Table 1.** Intra-, peri- and postoperative outcomes

Operative Time, mean (SD), minutes	141.2 $\pm$ 33.9
Docking + Console Operative Time, mean (SD), minutes	98.5 $\pm$ 22.6
Blood losses, median (IQR), milliliters	0 (0–50)
Intraoperative complications	0
Postoperative complications	6
Length of stay, median (IQR), days	4 (3–7)
Catheter removal, median (IQR), days	4 (2.5–6)
No drain placed	10
Double J stent removal, median (IQR), days	43.5 (37.5–45)
Drain removal, median (IQR), days	1.5 (1–2)
Preoperative creatinine	1.02 $\pm$ 0.76
Postoperative creatinine (at 4 months)	0.92 $\pm$ 0.45
Preoperative GFR	88 $\pm$ 28.3
Postoperative GFR (at 4 months)	101.1 $\pm$ 12.8
Total number of patients	30

SD – standard deviation; IQR – inter quartile range; GFR – glomerular filtration rate

## CONCLUSIONS

The use of a Contour™ ureteric stent showed to be a safe and feasible technical variation while performing a robotic-assisted pyeloplasty (RAP). Its use shows the main advantage in the execution of a trimesocolic approach, allowing for a correct identification of the pelviureteric junction obstruction (PUJO) and a minimal incision of the retroperitoneum to carry out the surgery. Peri- and post-operative outcomes are similar of those reported by other authors [1, 7–10]. Attention must be paid by the patient to avoid a displacement of the ureteric catheter before its conversion into a double J stent. Despite the overall operative time being slightly higher when compared to other reports in literature, mainly due to the required change of the patients' position after the Contour™ insertion, the global 'robotic' time (docking + console) showed to be one of the lower times in the reported literature [7, 8]. The preventive insertion of the stent, together with the inflation of saline solution during the RAP allowed for a quick and easy identification of the ureter and pelvic ureteric junction, and therefore can be performed through a minimal incision of the retroperitoneum. For this reason, we believe that this technique may be particularly useful during the learning curve, when also the anterograde stent insertion might be challenging.

## CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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