



## ORIGINAL ARTICLE

# Laparoscopic pyeloplasty: Technique and results in 80 consecutive patients<sup>☆</sup>

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### KEYWORDS

Ureteropelvic junction obstruction;  
Pyeloplasty;  
Laparoscopy;  
Anderson-Hynes;  
Robotic surgery

### Abstract

**Objective:** To present our long-term results with the Anderson-Hynes laparoscopic pyeloplasty, performed by a single surgeon.

**Materials and methods:** Between August 1999 and December 2009, 79 patients (80 procedures) were operated for primary ureteropelvic junction obstruction. We use the Anderson-Hynes technique by a transperitoneal approach. Patients were evaluated with Ultrasound, Excretory urography and dynamic renal scintigraphy (Mag-3). The perioperative characteristics, complications and results were reviewed.

**Results:** We performed 80 laparoscopic pyeloplasties in 79 patients. Mean operative time was 93.2 min (60–180). Crossing vessels were found in 38 of 82 (46.3%) renal units. Kidney abnormalities occurred in 4 patients (1 double ureteropelvic system, one associated retrocaval ureter, 1 horseshoe kidney and one pelvic kidney). Complications occurred in 5 procedures (6.5%): an immediately postoperative bleeding (Clavien 3b), 1 cecal volvulus (Clavien 3b), 1 urosepsis (Clavien 4th) and 1 urinary fistula (Clavien 3a). In this series there was neither mortality nor conversion to open surgery. There was recurrence in 3 out of 80 patients (3.7%). They were resolved as follows: 1 percutaneous antegrade endopyelotomy, 1 secondary laparoscopic pyeloplasty and 1 robotic pyeloplasty. There was a 96.3% of primary overall success rate.

**Conclusions:** Our results show that laparoscopic pyeloplasty compares favorably with the result achieved by open surgery. We believe that laparoscopic pyeloplasty is a good surgical alternative for the management of primary ureteropelvic junction obstruction.

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**PALABRAS CLAVE**

Estenosis  
pieloureteral;  
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Laparoscopia;  
Anderson-Hynes;  
Cirugía robótica

**Pieloplastia laparoscópica: técnica y resultados en 80 procedimientos consecutivos****Resumen**

**Objetivo:** Presentar nuestros resultados a largo plazo con la técnica de pieloplastia laparoscópica de Anderson-Hynes realizada por un solo cirujano.

**Material y métodos:** Entre agosto de 1999 y diciembre de 2009 se operaron 79 pacientes (80 cirugías) por estenosis pieloureteral primaria. Se utilizó la técnica de Anderson-Hynes por vía transperitoneal. Los pacientes fueron evaluados con ultrasonido, urografía excretora y centelleograma renal dinámico (Mag-3). Se realizó un análisis prospectivo de la serie, revisando las características perioperatorias, complicaciones y resultados.

**Resultados:** Se realizaron 80 pieloplastias laparoscópicas en 79 pacientes. El tiempo operatorio promedio fue de 93,2 min (60-180). En 38 de 82 (46,3%) unidades renales se encontró como hallazgo vasos polares en proximidad a la unión pieloureteral. Anomalías renales hubo en 4 pacientes (un doble sistema pieloureteral, un uréter retrocavo asociado, un riñón en herradura y un riñón pélvico). Ocurrieron complicaciones en 5 oportunidades (6,5%): sangrado postoperatorio inmediato que se manejó por vía laparoscópica (Clavien 3b), un vólvulo de ciego en el cual se realizó una hemicolectomía derecha con buena evolución postoperatoria (Clavien 3b), una sepsis urinaria (Clavien 4a) y una fístula urinaria de manejo médico (Clavien 3a). No hubo mortalidad en la serie ni conversión a cirugía abierta. Hubo recurrencia en 3 de 80 pieloplastias laparoscópicas (3,7%), las cuales fueron resueltas de la siguiente forma: endopielotomía percutánea en un caso, pieloplastia laparoscópica en un caso y pieloplastia robótica en otro caso. La tasa global de éxito primario fue de 96,3%.

**Conclusiones:** Nuestros resultados con la pieloplastia laparoscópica transperitoneal se comparan favorablemente con aquellos logrados por la cirugía abierta. Creemos que la pieloplastia laparoscópica es una alternativa segura para el manejo de la obstrucción de la unión pieloureteral primaria.

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**Introduction**

Pyeloureteral strictures with secondary hydronephrosis may lead to asymptomatic kidney damage both in children and in adult patients. Anderson-Hynes dismembered pyeloplasty is the classical surgical technique, which is chosen for the management of primary or secondary pyeloureteral strictures. It is traditionally performed via lateral or posterior lumbotomy, its long-term success rate exceeding 90%, by using the steps typically described.<sup>1,2</sup>

In order to reduce the comorbidity related to the lumbotomy incision, several minimally invasive techniques have been described, the most used being antegrade incision with percutaneous renal access, the endoscopic antegrade approach using rigid or flexible ureteroscopy and endoscopic cold-knife incision of the stricture, hot or laser cutting and balloon and cutting with an electrically charged wire and using a retrograde probe called Acucise. However, the long-term results of these different treatment alternatives have success rates which do not exceed 61–89%, with a risk of secondary hemorrhage.<sup>3,4</sup>

All these techniques share the same problem: the need to know if there are polar vessels in the kidney or not, which would be associated with pyeloureteral strictures with variable figures depending on the radiological study used. The introduction of selective angiography with computerized axial tomography or magnetic resonance imaging has enabled us to diagnose the presence of polar vessels with greater certainty, but also with increased costs.

Laparoscopic pyeloplasty was first described in 1993, with long-term success rates comparable to those of open surgery,<sup>5,6</sup> so it has definitely replaced open surgery at centers with experience in laparoscopy.<sup>7</sup>

We present a personal series of 79 consecutively operated patients, the surgical technique used, the complications and the long-term results.

**Materials and methods**

Our series comprised 79 patients who underwent laparoscopic pyeloplasties (bilateral pyeloplasty in one case) and who were consecutively operated on with the same surgical technique and by the same surgeon (OAC).

A group of pediatric patients on whom we used a video-assisted technique and who were the subject of a previous publication<sup>8</sup> was excluded from this analysis.

Their average age was 33.4 years, and a range of 3–75 years of age, 38 women (%) and 41 men. Pyeloureteral strictures were located on the left side in 31 patients (38.5%) and on the right side in 48 patients. There was a case of bilateral pyeloureteral stricture and the patient was operated on time.

**Surgical technique**

Preoperative preparation consisted of an 8-h fast. The patient is placed in the lateral position, with the same position used for any kind of retroperitoneal laparoscopic

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