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Original Article

Retroperitoneal laparoscopic non-dismembered pyeloplasty for uretero-pelvic junction obstruction due to crossing vessels: A matched-paired analysis and review of literature

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Abstract *Objective:* To compare laparoscopic Anderson-Hynes pyeloplasty (LAHP) and retroperitoneal laparoscopic YV-pyeloplasty (LRYVP) in ureteropelvic junction obstruction (UPJ) in presence of a crossing vessels (CV).
Methods: Our database showed 380 UPJO-cases,who underwent laparoscopic retroperitoneal surgery during the last 2 decades including 206 non-dismembered LRYVP, 157 dismembered pyeloplasties LAHP, and 17 cases of laparoscopic ureterolysis. Among them 198 cases were suitable for a matched-pair (2:1) analysis comparing laparoscopic retroperitoneal non-dismembered LRYVP (Group 1, $n = 131$) and dismembered LAHP (Group 2, $n = 67$) in presence of a crossing vessel. Patients were matched according to age, gender, kidney functions, and obstruction grade. Complications were graded according to modified Clavien-classification.
Results: Comparative data were similar between both groups (LRYVP *vs.* LAHP) including mean operating time (112 min *vs.* 114 min), complication rates (4.2% *vs.* 7.3%) mainly Grade 1–2 according to Clavien classification, and success rates (90% *vs.* 89%). These results reflected in the reviewed literature indicate that LRYVP provides the advantage of minimal dissection in case of CV with similar outcome. However, redundant pelvis and anteriorly crossing vessels still require a dismembered pyeloplasty LAHP.

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Conclusion: LRYVP has achieved similar results compared with the previous golden standard of open surgery, especially in case of crossing vessels apart from presence of a redundant pelvis or anteriorly crossing vessel. This can be further improved when using the small access retroperitoneoscopic technique respectively mini-laparoscopy.

1. Introduction

Uretero-pelvic junction (UPJ) stricture represents a common congenital cause of upper urinary tract obstruction leading to progressive dilatation of the renal collecting system [1]. Clinical manifestations of uretero-pelvic junction obstruction (UPJO) include flank pain, renal colic and infection, which may result in progressive deterioration of renal function [2]. Gold standard surgical treatment for UPJO has been open dismembered pyeloplasty using the Anderson-Hynes pyeloplasty (AHP) yielding >90% success rates (Table 1) [3—12]. In contrast to this, percutaneous antegradeor ureteroscopic retrograde endopyelotomy did not sustain the test of time due to higher recurrence rates [13—18]. On the other hand, laparoscopic and retroperitoneoscopic repair with and without robotic assistance became the method of choice at several centres within the last decade providing same success rates like open surgery with significantly less morbidity (Table 2) [19—28].

Among these techniques laparoscopic retroperitoneal pyeloplasty using a non-dismembered YV-plasty (LRYVP) has evolved as a viable alternative [29—31]. Additionally, mini-laparoscopic approaches like the small access retroperitoneoscopic technique (SMART) could further decrease the morbidity of the operation with improvement of the cosmetic result [30—32]. Based on our experiences with 380 patients treated by laparoscopic pyeloplasty during the last 20 years we described our actual technique and discussed the future role of LRYVP in presence of the existing literature.

2. Materials and methods

2.1. Classification of UPJO

UPJO can be classified into intrinsic (primary) stenosis and extrinsic (secondary) stenosis.

Table 1 Open pyeloplasty—results of the literature.

Author (year)	*n*	Age (year) (range)	Access	Primary UPJ-stenosis (%)	Crossing vessels (%)	Mean OR-time (min)	Success / excellent rate (%)	Complication rate (%)
Nguyen (1989) [3]	68	2 (<1—28)	Flank	100	n.a.	n.a.	93.4/n.a.	17.1
MacNeily et al. (1993) [4]	75	1 (<1—19)	Flank	100	n.a.	n.a.	90.7/85.0	17.0
Woo and Farnsworth (1996) [5]	63	<1	Flank	100	n.a.	n.a.	94.0/n.a.	11.0
Wiener and Roth (1998) [8]	17	3	Flank	100	n.a.	110	94.0/n.a.	23
Wiener and Roth (1998) [6]*	16	4	Lumbar	100	n.a.	107	94.0/n.a.	12.5
McAleer and Kaplan (1999) [7]	79	1 (<1—18)	Flank	100	n.a.	n.a.	90.0/71.0	n.a.
Bauer et al. (1999) [8]	35	n.a. (adults)	Flank	100	38	163	94.0/82.9	11.0
Sanchez Zalabardo (2000) [9]	62	29 (<1—68)	Flank	n.a.	n.a.	n.a.	90.3/n.a.	29.0
Austin et al. (2000) [10]	137	2 (<1—10)	Flank	100	n.a.	n.a.	99.0/91.0	2.9
O'Reilly (2001) [11]	28	39 (12—72)	Flank	100	n.a.	n.a.	82.2/67.9	17.9
Klingler (2003) [12]	15	41 (13—69)	Flank	100	47	n.a.	93.3/n.a.	40.0
Total	595	<1—41 (<1—72)			38—47	107—163	90—99/68—91	2.9—40.0

*Comparative studies; UPJ, ureteropelvic junction; OR, operating room; n.a., not available.