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Patients' Perception of Surgical Outcomes and Quality of Life after Retroperitoneoscopic and Open Pyeloplasty

Wael Y. Khoder^a Raphaela Waidelich^a Armin J. Becker^a Alexander Karl^a
Nicolas Haseke^a Ricarda M. Bauer^a Christian G. Stief^a Alexander Bachmann^b
Nicole Ebinger Mundorff^b^aDepartment of Urology, University Hospital Munich-Grosshadern, Ludwig Maximilian University Munich, Munich, Germany; ^bDepartment of Urology, University Hospital Basel, Basel, Switzerland

Key Words

Retroperitoneoscopic pyeloplasty · Pyeloplasty ·
Ureteropelvic junction obstruction · Open pyeloplasty

Abstract

Purpose: To report postoperative health-related quality of life (HRQoL) and patients' subjective evaluations of open pyeloplasty (OP) and retroperitoneoscopic pyeloplasty (RP) and influences on preoperative counselling. **Methods:** 107 patients (age 16–80 years, mean 31.5) with symptomatic primary ureteropelvic junction obstruction who underwent OP (32) or RP (75) were evaluated prospectively. HRQoL was evaluated using Short Form 36 (SF-36) questionnaires with 1 year follow-up. Operative outcomes were evaluated using a self-designed questionnaire regarding cosmetic outcomes, objective postoperative/current pain, convalescence and return to work. **Results:** The mean operative time was 174.4 vs. 161.4 min for RP versus OP, respectively, without intraoperative complications/conversions. There was an advantage for RP – except for two domains – without significance in any of the eight SF-36 domain scores. An advantage favouring RP in all aspects of the second questionnaire with significance in four aspects (cosmetic results, scar length, pain and con-

valescence) was found. Five weeks postoperatively, 58.7% (RP) vs. 25.8% (OP) were fully convalescent compared to 87.0% (RP) vs. 71.0% (OP) at 8 weeks. Similarly, 58.7 vs. 45.1% returned work 5 weeks postoperatively while 93.5 vs. 74.2% did so after 8 weeks, respectively. The small sample size, more questions on satisfaction/regret and mixed design are the main study limitations. **Conclusion:** RP provides the same functional results beside earlier convalescence, better HRQoL and patients' convenience with surgery, which favours its inclusion in preoperative counselling providing patients with realistic postoperative expectations.

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Introduction

Pyeloplasty is the standard surgery for ureteropelvic junction obstruction (UPJO) aiming to relieve symptoms and/or to preserve remaining renal function. Despite the high success rate (>95%) of open pyeloplasty (OP) [1], minimally invasive techniques have been developed to

W.Y. Khoder and R. Waidelich shared senior authorship.

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0042–1138/13/0921–0074\$38.00/0E-Mail karger@karger.com
www.karger.com/uinDr. W.Y. Khoder, MD, PhD, FEBU
Urologische Klinik und Poliklinik, Klinikum Grosshadern
Marchioninistrasse 15
DE–81377 München (Germany)
E-Mail wael.khoder@med.uni-muenchen.de

lower its morbidity since the first successful OP reported by Kuster in 1891 [2].

Laparoscopic pyeloplasty (LP), initially reported by Kavoussi, has proved to be a safe and effective treatment for UPJO [3–5]. Retroperitoneoscopic pyeloplasty (RP) has evolved synchronously to LP with a success rate comparable to LP and OP [5]. The technique of LP/RP has been simplified over the years. Rising experience with this technique has made it safer, reproducible and standardized. The learning curve has become significantly shorter as more surgeons are familiar with these techniques [6–11].

Health-related quality of life (HRQoL) has become a major parameter in evaluating the outcome of a treatment and even constitutes a main criterion when choosing among different interventions with similar efficacy and morbidity [12]. The current study aims to compare surgical outcomes, HRQoL and patients' subjective evaluations of both standard approaches (OP and RP) to detect possible benefits of the procedures from the patients' point of view. This may be an addition to the preoperative counselling of these patients.

Patients and Methods

Patients

A total of 107 consecutive patients (64 male and 43 female, age 16–80 years, mean 31.5 years) with symptomatic primary UPJO, who underwent OP or RP, were evaluated for postoperative parameters and HRQoL. The surgical approach was OP (32 patients) and RP (75 patients), performed at the University Hospital of Basel (Switzerland) and the Ludwig Maximilian University Hospital in Munich (Germany). Both centres equally shared the patient collective. UPJO was treated in the left (72 cases) and right side (35 patients). OP was done according to patients' preference or before our experience with RP without any selection. Patients characteristics are presented in table 1.

Patients were assessed preoperatively by routine laboratory parameters, retrograde/intravenous pyelography and diuretic renography using ⁹⁹Tc mercaptoacetyltriglycine. All cases had one or more specific criteria of hugely dilated pelvis (42.0% 2nd and 3rd grade, 45/107), crossing vessels at the ureteropelvic junction (36.4%, 39/107) and/or compromised function of the affected kidney. Patients were operated retroperitoneally (open or endoscopic) under combined general and epidural anaesthesia.

Operative Data

The procedures were performed as described in the literature [6, 10]. The patient was placed in a lateral position for both approaches. A flank lateral incision was used for the open approach. The skin and subcutaneous tissues were incised over tip of the 12th rib, extending along the superior border of the 12th rib (≈8 cm). The latissimus dorsi, external oblique and internal oblique muscles were transected and the transversus abdominis was divided in the

Table 1. Demography of the included OP and RP patients

Characteristics	OP	RP
Number of patients	32	75
Average age, years	28.6 (16–74)	47.0 (16–80)
Sex, M/F	16/16	48/27
Side, left/right	10/22	61/14
Median operative time, min	161.4 (40–365)	174.4 (70–360)
Average blood loss, ml	160 (90–360)	180 (50–200)

direction of its fibres with preservation of the intercostal neurovascular bundle. The transversalis fascia was divided with scissors near the tip of the 12th rib followed by blunt dissection of the peritoneum from the anterior abdominal wall. The Bookwalter™ retractor (Codman & Shurtleff, Inc., Raynham, Mass., USA) was placed to retract the incision (11th rib and rib cage superiorly and 12th rib and abdominal wall inferiorly). The retroperitoneal space was then developed through blunt and sharp dissection and the kidney with its surrounding soft tissues was reflected medially. The renal pelvis with the proximal ureter were then identified and dissected.

For the retroperitoneal approach, a 1-cm incision was made at the tip of last rib along the mid axillary line. The external, internal oblique and transversus abdominis muscle fibres were bluntly separated with a Kocher clamp. After the peritoneum had been digitally dissected medially from the abdominal wall and dorsally from the psoas muscle, a balloon made from the middle finger of a size 8 surgical glove and tied to the top of a 12-mm trocar was placed in the retroperitoneal space and inflated with 500–700 ml of saline to produce a working space. Inflation was maintained for a couple of minutes to allow haemostasis. In this manner, a working space to the upper retroperitoneum was obtained. The balloon was removed and the trocar was fixed in place using a 0 nylon suture to prevent carbon dioxide leakage. Carbon dioxide insufflation at a pressure of 13 mm Hg was started to maintain the working space and diagnostic laparoscopy using a 30° optic was done. The peritoneum was dissected from the anterior abdominal wall using the optic to insert another port (12 mm for right-side or 5 mm to left-side pyeloplasty) in the anterior axillary line 2–3 cm above and medial to the anterior superior iliac spine. The second working port was made 1 cm from the middle point of the line between both ports. The whole procedure was done through these two ports.

The principle of Anderson-Hynes pyeloplasty was applied in all cases with trimming of redundant renal pelvis. Ureteropelvic re-anastomosis was performed by intracorporeal free hand continuous suturing using 4-0 polyglactin and laprotill clips [8]. A 7-French ureter stent was placed retrogradely only at beginning of the series and removed 2–8 weeks postoperatively (median 4.2 for OP and 4.8 for RP). In patients with renal stones, ureter stents were left in place until complete fragmentation of the calculi (n = 12). Patients started oral intake on the first postoperative day and the urethral catheter was removed after 2–5 days. The drainage tubes were removed after cessation of drainage/serous discharge. Operative time (from introduction of the first port till closure of last port site), intraoperative and postoperative complications were recorded.

Follow-Up

HRQoL was evaluated using the Short Form 36 (SF-36) questionnaire with follow-up of 1 year. It has been specially validated for the German-speaking population (IQOLA-SF-36 German version 1992) and has been used to evaluate possible body limitations through physical health problems, body pains, general health, vitality, social functioning, emotional problems and mental health. The Mental Component Summary Score and the Physical Component Summary Score are calculated according to a given SF-36 syntax [13].

Furthermore, operation-related outcomes were evaluated using a self-designed questionnaire. Patients were asked a set of 20 questions (Q) regarding cosmetic outcomes (8Q), postoperative symptoms/complications (3Q), objective postoperative pain [early (3Q) and current situation (1Q)], convalescence (1Q), time to return to work (1Q), acceptance of operation (1Q), fluid intake (1Q) and follow-up intervals (1Q).

Results

Presenting symptoms were renal flank pain (49.5%, 53/107), colic without evidence of nephrolithiasis (9.3%, 10/107), recurrent pyelonephritis (15.9%, 17/107) and nephrolithiasis (12.0%, 13/107) while 13.0% (14/107) were asymptomatic.

The diagnosis of anatomical/functional UPJO was documented preoperatively through abdominal ultrasound (107 patients, 100%), abdominal CT (32, 29.9%), MRI (5, 4.7%), intravenous pyelography (21, 19.6%) and retrograde pyelography (87, 81.3%). Renal scintigraphy revealed ipsilateral renal function of 19–24 in 7.5%, 25–29 in 12.1%, 29–39 in 28.0%, 40–49 in 35.5% and >50 in 16.8% of patients, respectively. Renal glomerular filtration rates as well as total function were within the age-adapted normal range. Preoperative nephrostomy tube insertion was necessary in 2 emergency patients while a double-J[®] catheter was inserted electively.

Operative time was 70–360 min (mean 174.4) and 40–365 min (mean 161.4) with a median blood loss of 180 and 160 ml for RP and OP, respectively. Crossing vessels (36.4%, 39/107), obstructing adhesions/ureteric scars (18.7%, 20/107) and primary UPJO (44.9%, 48/107) were found. Postoperative complications were ureter stent dislocation (n = 1), temporary nephrostomy for hydronephrosis (n = 1), which was successfully treated conservatively without need of re-operation, and epididymitis (n = 1).

77 patients (31 OP and 46 RP) returned their SF-36 questionnaire. A standardized scale allowed the patients' answers to be assigned to an individual domain score. This was translated to a scale of 0–100 (0 = very poor,

100 = excellent). Clinical relevance starts from a difference of at least 20 points. Results are shown in figure 1 and table 2.

An advantage in favour of RP was seen in six of eight domain scores (physical functioning, general health problems, vitality, social functioning, emotional role function, mental health). In two domains (limitations caused by physical health and bodily pains), the OP results were slightly better than those of RP. However, neither group showed any significant difference in any of SF-36 domain scores.

Table 3 demonstrates all results of the second questionnaire. A large proportion of this questionnaire evaluated the cosmetic outcomes of surgery. 25.0% of patients claimed to be 'concerned' about cosmetic results preoperatively. 23.5% reported that this outcome played a 'minor role', and 51.5% were 'not worried' about the cosmetic result (19.6% of them reported that the importance of this issue increased over time postoperatively).

Patients reported different grades of satisfaction regarding their cosmetic results: 26.0 vs. 22.5% 'excellent', 39.1 vs. 35.5% 'very good', 19.6 vs. 19.4% 'good', 17.4 vs. 9.7% 'slightly bad' and 2.2 vs. 9.7% 'bad' for RP versus OP, respectively. Furthermore, 50.0 vs. 48.4%, 39.1 vs. 22.6% and 3.2 vs. 10.9% of RP versus OP patients reported that they were 'not disturbed', 'slightly disturbed' and 'disturbed' with their scars, respectively, while 0 vs. 25.8% reported to be 'much disturbed' for RP versus OP, respectively.

Postoperative scar length was reported to be between 7 and 30 cm (average 13.9 cm) for OP. This was judged as 'small' (54.8%), 'moderate' (16.1%), 'large' (19.4%) and 'very large' (9.7%) by patients. The reported sum scar lengths of RP patients were between 2.5 and 7 cm (average 3.7 cm), which were judged as 'small' (60.9%), 'moderate' (39.1%), 'large' (0%) and 'very large' (0%). Patients evaluated the location of their scar(s) as 'not disturbing' (67.4 vs. 28.4%), 'slightly disturbing' (26.0 vs. 25.8%) and 'disturbing' (4.3 vs. 22.6%) for RP versus OP, respectively.

A second set of questions aimed to evaluate early/current (1 year) postoperative pain. 45.7 vs. 16.1% of patients claimed that the operation was 'not painful', 32.6 vs. 45.1% 'slightly painful', 13.0 vs. 16.1% 'painful', while 8.7 vs. 22.7% judged it as 'very painful' for RP versus OP, respectively. Surgical scars were reported by 69.6 vs. 67.7% as 'painless', 21.7 vs. 16.1% 'slightly painful', 8.7 vs. 16.1% 'painful' and 0 vs. 0% 'severely painful' for RP and OP at evaluation, respectively. Furthermore, patients were

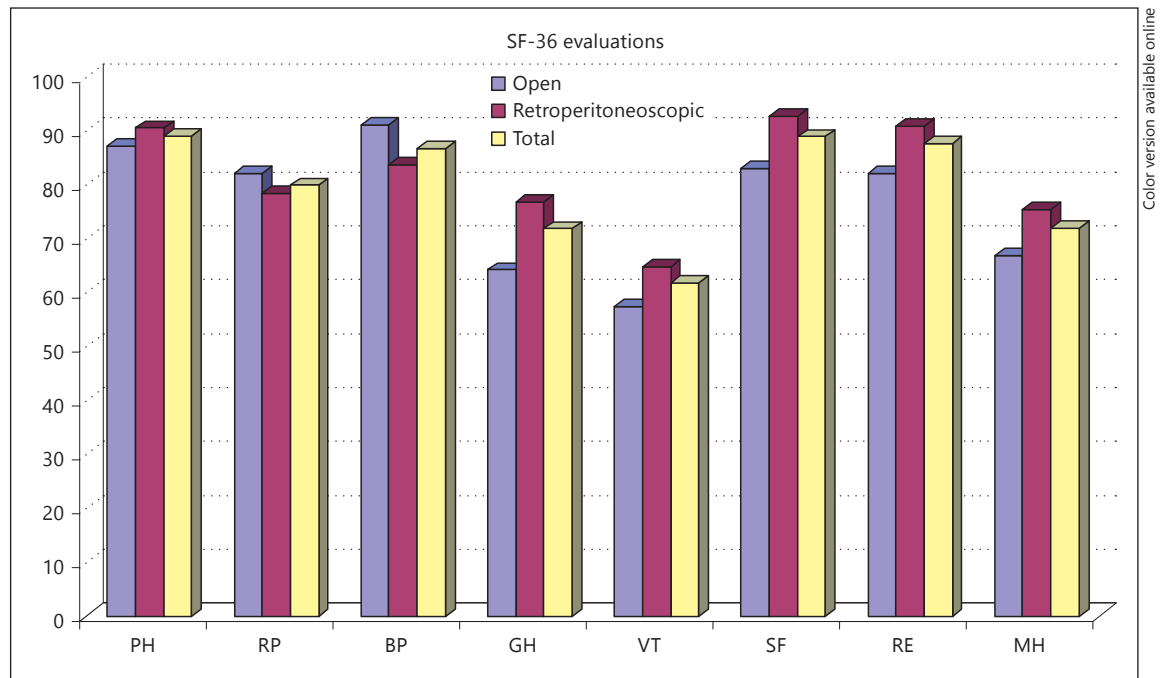


Fig. 1. Results of the eight domain scores of the SF-36 in patients after OP and RP versus the total collective. PH = Physical functionality; RP = role limitations caused by physical health problems; BP = bodily pain; GH = general health; VT = vitality; SF = social

functioning; RE = role limitation caused by emotional problems; MH = mental health. Furthermore the Mental Component Summary Scores were calculated. Scores per dimension range from 0 to 100; higher scores indicate better health status.

Table 2. Mean and standard deviation (SD) of the results of the SF-36 for total operations, OP and RP

	Mean all	SD all	Mean OP	SD OP	Mean RP	SD RP
Physical functionality	89.1	17.5	87.1	19.8	90.5	15.7
Role limitations caused by physical health problems	79.9	37.2	82.1	35.9	78.4	37.9
Bodily pain	86.7	16.6	91.0	12.9	83.7	18.2
General health	71.8	20.5	64.2	15.5	76.8	21.8
Vitality	61.8	20.3	57.3	24.5	64.8	16.1
Social functioning	88.9	16.9	83.0	19.8	92.6	13.4
Role limitations caused by emotional problems	87.6	25.3	82.1	31.0	90.9	20.6
Mental health	71.9	16.6	66.7	17.6	75.4	14.9

The Mental Component Summary Scores were calculated. Scores per dimension range from 0 to 100; higher scores indicate better health status.

asked to evaluate their pain level on a scale from 0 ('absolutely painless') to 10 ('severe pain') (fig. 2).

Another question was whether patients felt increasingly ill because of the operation. 4.3 vs. 12.9% answered 'yes', 89.1 vs. 83.9% 'no' and 6.5 vs. 3.2% with 'I do not know' of RP versus OP patients.

The last two questions aimed to find out how soon patients were fully convalescent postoperatively and when they were back to work. Five weeks postoperatively, 58.7% (RP) vs. 25.8% (OP) of patients were fully convalescent compared to 87.0% (RP) vs. 71.0% (OP) at 8 weeks. Similarly, 58.7 vs. 45.1% returned to work at

Table 3. Results of the self-made life quality questionnaire in patients post RP versus OP

Parameter/questions	RP versus OP				
<i>Cosmetic results</i>					
	Excellent	Very good	Good	Slightly bad	Bad
How satisfied are you with the cosmetic results of surgery?	26.0 vs. 22.5%	39.1 vs. 35.5%	19.6 vs. 19.4%	17.4 vs. 9.7%	2.2 vs. 9.7%
	Not disturbed	Slightly disturbed	Disturbed	Much disturbed	
Are you disturbed by your scar(s)?	50.0 vs. 48.4%	39.1 vs. 22.6%	3.2 vs. 10.9%	0 vs. 25.8%	
Did the position of scar(s) disturb you?	67.4 vs. 28.4%	26.0 vs. 25.8%	4.3 vs. 22.6%	2.3 vs. 23.2%	
	Small	Moderate	Large	Very large	
Did you think that your scar(s) are long?	60.9 vs. 54.8%	39.1 vs. 16.1%	0 vs. 19.4%	0 vs. 9.7%	
	Concerned	Minor role	Not worried		
Were you concerned about the cosmetic results of surgery?	25.0%	23.5%	51.5%		
	No	Little	More than little	Yes	
Did cosmetic results become more important to you with time postoperatively?	81.2 vs. 78.6%	18.2 vs. 14.3%	6.0 vs. 7.2%	0 vs. 0%	
How long are your scars? (average in cm)	3.7 vs. 13.9				
<i>Pains</i>					
	Painless	Slightly painful	Painful	Very painful	
Did you have pains/complications early postoperatively?	45.7 vs. 16.1%	32.6 vs. 45.1%	13.0 vs. 16.1%	8.7 vs. 22.7%	
Was the operation a painful event for you?	37.3 vs. 14.2%	50.0 vs. 28.6%	4.6 vs. 14.3%	9.0 vs. 42.9%	
Do you have scar pain now?	69.6 vs. 67.7%	21.7 vs. 16.1%	8.7 vs. 16.1%	0 vs. 0%	
Please evaluate your pain in a scale from 1 to 10 figure 2b					
<i>Postoperative symptoms/complications</i>					
	No	Yes			
Did you still have any symptoms similar to these at presentation before surgery?	100 vs. 100%	0 vs. 0%			
	UTI	Stones	No		
Did you have urinary tract infections or recurrent kidney stones in the same side?	3.7 vs. 13.9%	0 vs. 0%	96.3 vs. 86.1%		
<i>Convalescence</i>					
	At 5 weeks	At 8 weeks			
When were you completely convalescent?	58.7 vs. 25.8%	87 vs. 71%			
<i>Return to work</i>					
	At 5 weeks	At 8 weeks			
When did you return to work?	58.7 vs. 45.1%	93.5 vs. 74.2%			
<i>Recurrence</i>					
	No	Yes			
Have you had a re-pyeloplasty operation?	100 vs. 100%	0 vs. 0%			
<i>Acceptance of the procedure</i>					
	No	Yes	I do not know		
Did you have a feeling of being ill because of the operation?	89.1 vs. 83.9%	4.3 vs. 12.9%	6.5 vs. 3.2%		
<i>Follow-up</i>					
	Yes	No			
Are you satisfied with the follow-up examinations and intervals?	100 vs. 100%	0 vs. 0%			
How much did you drink per day?	≤2 l/day (45.1%)		>2 l/day (54.9%)		

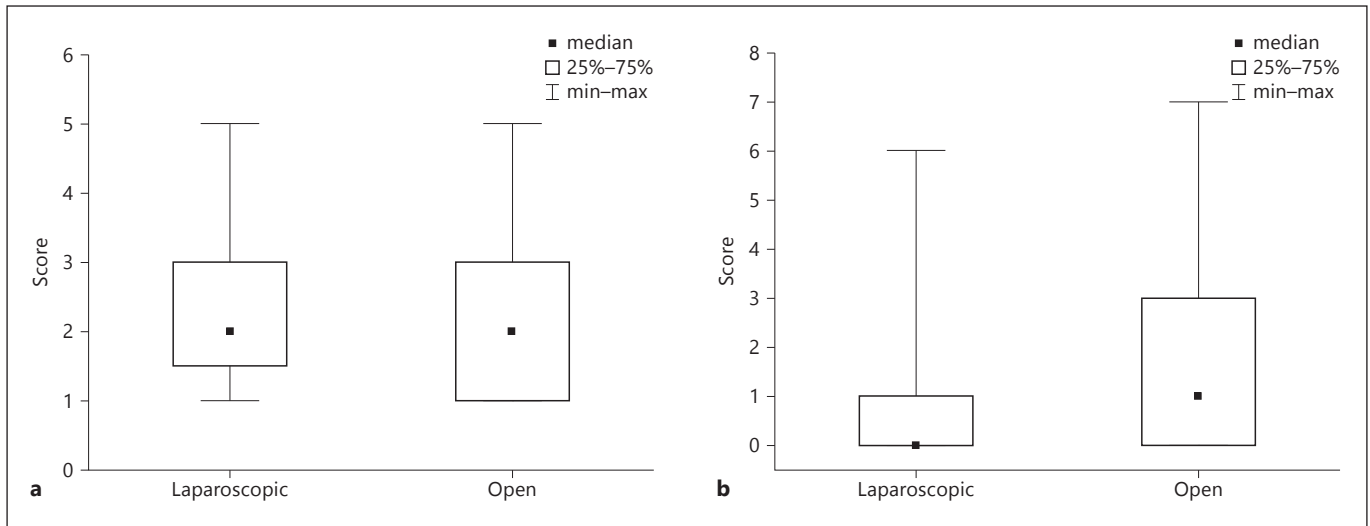


Fig. 2. Evaluations of the patients' answers to some questions of the second questionnaire. **a** 'How much are you satisfied with the cosmetic results regarding your scars?' **b** 'Please describe your current pains, if present, using the following scale between 0 (no pain) and 10 (very strong pain)'.

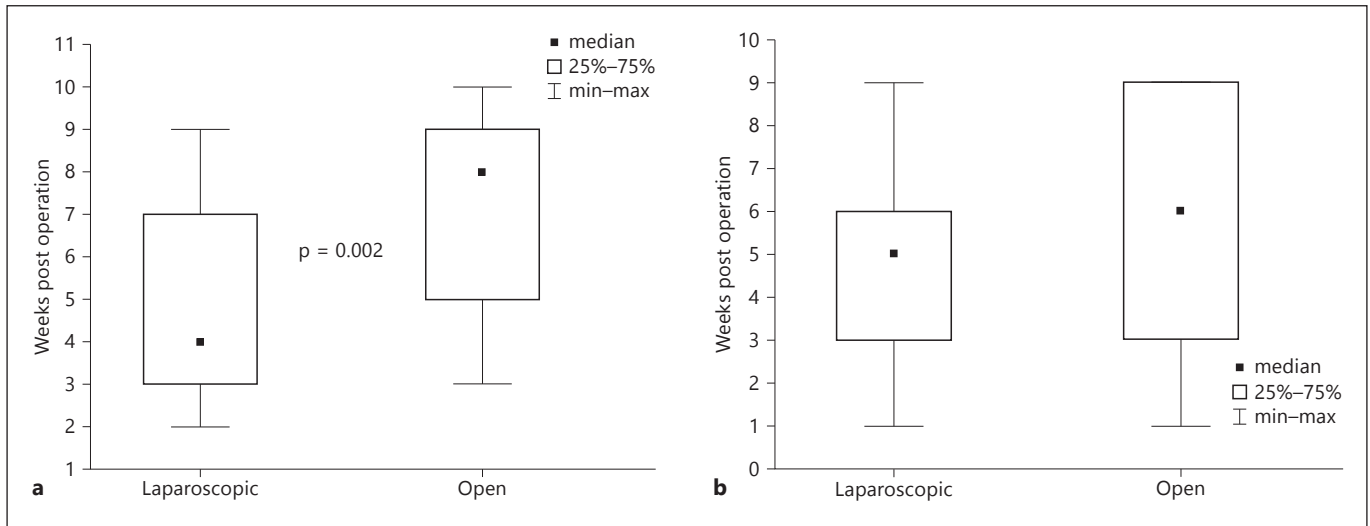


Fig. 3. Evaluations of the patients' answers to questions of the second questionnaire regarding convalescence and return to work. **a** Convalescence period: 'How long did it take after the operation to be again completely (100%) physically normal?' **b** 'When did you returned back to your work after the operation?'.

5 weeks while 93.5 vs. 74.2% returned after 8 weeks, respectively (fig. 3).

Univariate analysis revealed an advantage to RP over OP with a significant difference in five questions related to the cosmetic results, scar length, postoperative pains and postoperative convalescence results.

Discussion

A major aim of any reconstructive surgery is to improve patients' quality of life. Clinicians often estimate an intervention to be successful if it solves the primary obstruction. Surgeons are able to characterize the result of

pyeloplasty with objective tests such as postoperative radiography/renography. However, measuring HRQoL can add another dimension to the surgical outcomes, providing patients with the best quality of health care.

The present study shows for the first time the impact of two standard surgical procedures (OP and RP) in terms of HRQoL as well as subjective patient evaluation over an intermediate follow-up time. Both participating centres consider RP as a standard UPJO management. Generally, the literature data support that RP combines the highly successful OP results and the quick postoperative recovery after laparoscopy [14–17].

Laparoscopic procedures have been associated with lower plasma levels of cytokines like IL-1, IL-6, IL-10 and CRP compared with conventional resections. The extent of this reaction to operative trauma correlates more with the approach than with the extent of the procedure. Renal surgeries trigger a systemic acute phase reaction which can be limited by the laparoscopic access [18]. These mild systemic reactions may be responsible for the rapid postoperative convalescence [18, 19].

The current surgical and functional outcomes are comparable with previous studies [5–10, 14–17]. Furthermore, RP proved to be superior for intraoperative blood loss and early postoperative complications, although operative time was longer. Functional results are comparable between the two groups. Importantly, patients report high HRQoL independent from the technique used, which is a logical reflection of surgical healthy patients. Only 4.3% (RP) vs. 12.9% (OP) of patients had a feeling of being ‘slightly ill’ because of the operation.

There is no known standard questionnaire for the evaluation of such cases. The mentioned self-made broad-spectrum questionnaire was designed to evaluate all operation-related aspects in these patients. Generally, RP patients reported better results in all evaluated aspects (cosmetic, postoperative pain (early/current), convalescence, return to work) than OP patients. RP patients expressed their satisfaction with cosmetic results as a clear advantage over OP (28.0 vs. 14.0%, respectively). On the other hand, 19.4 and 9.7% of OP patients reported their frustration regarding scar length (being long and very long, respectively) and 22.6 and 23.2% regarding scar location (being disturbed and much disturbed, respectively).

Another advantage for RP was postoperative and current (1 year) pains. Early pain was reported by 8.7% (RP) vs. 22.7% (OP) as ‘strong pain’, while current scar pain was reported by 8.7% (RP) vs. 16.1% (OP) patients.

A notable benefit is the significant difference in the convalescence period. At 5 weeks, 58.7% (RP) vs. 25.8% (OP) felt ‘fully convalescent’ again. This was better at 8 weeks, reaching 87.0% (RP) vs. 71.0% (OP). Accordingly, return to work was reported in 58.7% (RP) and 45.1% (OP) after 5 weeks postoperatively, while in 93.5% (RP) and 74.2% (OP) it was after 8 weeks.

There was no significant difference in any of the eight SF-8 domain scores, although RP revealed superior results in six domains compared to OP (statistically insignificant). Possible explanations are the timing of the HRQoL assessment, small sample size or lack of the calculations’ power provided. Following conventional upper urinary tract surgery, complete recovery usually takes several weeks to months. With the advent of laparoscopy, these times have been significantly shortened [20]. Accordingly, the SF-8 questionnaire should have been administered at an earlier time point or at different follow-up time points to observe the gradual improvement in physical health.

Further, comparing the outcomes between open and laparoscopic nephrectomy (simple, radical and donor) using the postoperative recovery scale (modified SF-36 for evaluation of post-nephrectomy patients) revealed that postoperative HRQoL in both groups did not reach baseline values until at least 1 year. Laparoscopic patients did better than open surgery patients at each time point assessed [21]. Current 1-year results confirm that HRQoL does not seem to be negatively affected in both procedures.

A previous study evaluating HRQoL after laparoscopic urinary tract surgery for malignant and benign conditions showed no significant difference between pre- and postoperative SF-8 evaluations [22]. However, the patient groups were heterogeneous, which limits interpretation for specific surgical approaches. In the current series, patients were asked more detailed questions about surgery in order to evaluate all aspects from the patients’ point of view.

The current data support that RP is not only safe, but also leads to good postoperative HRQoL. These observations confirm the minimal invasiveness of RP over OP from the patients’ point of view and encourage the addition of this procedure, as a valuable therapy, to the preoperative counselling of patients.

Patient self-evaluation has been previously reported for other postoperative functions to have reliability and discriminating power [23, 24]. Further financial analyses will be necessary to quantify the impact of RP on workplace productivity and the indirect costs borne by patients

and employers. However, the current information is of outmost value to case managers, patients and clinicians aligned on reducing morbidity and hastening early return to normal work. There is for sure a financial impact of the clearly shown differences in rehabilitation time on the reduction of costs and the gain in productivity (for both health system and patients work) based on the current results for RP.

The current study has limitations, as for instance the difference in the idiosyncrasies of the two national health systems. The mixed prospective and retrospective design may have allowed for a certain self-selection bias, however, patients were enrolled in a consecutive series. Furthermore, the nature of the study neither allows for the assessment of HRQoL at specified postoperative time points nor for evaluations of change from baseline HRQoL. Our intention was to demonstrate the patients' subjective evaluations of these standard techniques. In addition to small sample size, more questions on satisfaction and regret could have provided more aspects regarding outcomes. This issue needs validation in future prospective studies.

Despite these limitations, we think that our findings are robust. Currently, a prospective randomized trial comparing minimally invasive versus open pyeloplasty is unethical and not feasible. The studied groups were strictly comparable in all aspects, omitting biases that could compromise the broadness of the conclusions reached. This was the first time a study addressed outcome measures from the patients' point of view.

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However, pain and convalescence are objective feelings which can be differently interpreted by different patients. Treatment satisfaction is mainly derived from perceived differences between expectations and experience [25]. Expectations of one's future health state have been shown to influence patients' reported HRQoL [26]. Thus patients who choose the 'less invasive' RP may have higher expectations for their postoperative HRQoL compared to patients choosing 'traditional' surgery. Therefore, even when they achieve similar functional outcomes with better evaluation score results compared to OP patients, they may still experience a higher level of dissatisfaction. This could explain the current results showing a statistical significance in only five questions between the two groups. Based on these results, preoperative patient counselling should provide them with realistic expectations for the postoperative results to avoid dissatisfaction.

Conclusion

The follow-up results and patient evaluations revealed complete patient satisfaction with RP with a better HRQoL versus OP. A loin wound is arguably not necessary for either a successful outcome or patients' convenience after surgery. Preoperative counselling should include RP and provide patients with realistic expectations for the time after surgery.

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