DOI: https://doi.org/10.17816/uroved633376

Comparative analysis of the outcomes of laparoscopic buccal ureteroplasty and renal descensus with ureteral resection for extensive strictures of the proximal ureter and ureteropelvic junction

Bahman G. Guliev [1, 2], Boris K. Komyakov [1, 3],
Zhaloliddin P. Avazkhanov [2], Oibek Sh. Abdurakhmanov [2]

[1] North-Western State Medical University named after I.I. Mechnikov, Saint Petersburg, Russia;
[2] City Mariinsky Hospital, Saint Petersburg, Russia;
[3] City Multidisciplinary Hospital No. 2, Saint Petersburg, Russia

ABSTRACT

BACKGROUND: Recurrent and extensive strictures of the ureteropelvic junction and proximal ureter pose a significant challenge in modern reconstructive urology, as standard surgical procedures are not always effective or technically feasible. Such cases require complex upper urinary tract surgeries, such as renal descensus with ureteral resection and end-to-end anastomosis, or substitution of the stenotic segment with a buccal mucosa graft.

AIM: To conduct a comparative analysis of the outcomes of laparoscopic buccal ureteroplasty and renal descensus with ureteral resection and end-to-end anastomosis.

MATERIALS AND METHODS: Surgical reconstruction of extensive recurrent strictures of the ureteropelvic junction and the upper and middle thirds of the ureter was performed in 72 patients: 35 men (48.6%) and 37 women (51.4%), aged 19 to 77 years. The patients were divided into two groups: group 1 included 30 patients (41.6%) who underwent buccal mucosa ureteroplasty, and group 2 included 42 patients (58.4%) who underwent renal descensus with resection of the stenotic ureteral segment and end-to-end anastomosis. The causes of stenosis included previous pyeloplasty (n = 54), contact ureterolithotripsy in the proximal ureter (n = 12), impacted stones (n = 4), ureteropelvic junction injury during laparoscopic excision of a parapelvic cyst of the left kidney (n = 1), and retroperitoneal fibrosis due to acute cholecystopancreatitis (n = 1). Laparoscopic access was used in 69 patients, and robot-assisted access was used in 3 cases.

RESULTS: A major intraoperative complication occurred in one patient from group 2, who developed bleeding from a lower pole vessel, requiring conversion. Group 1 demonstrated significantly shorter operative time (197.1 ± 52.9 vs. 227.6 ± 30.6 min, p = 0.003), lower blood loss (93.0 ± 21.0 vs. 176.6 ± 44.6 mL, p < 0.001), fewer postoperative complications (23.3% vs. 47.5%, p = 0.039), and a lower reoperation rate (6.6% vs. 30.8%, p = 0.043). The surgical success rate was 93.4% in group 1 and 71.5% in group 2 (p = 0.0009).

CONCLUSIONS: Compared with renal descensus, ureteral resection, and end-to-end anastomosis, buccal ureteroplasty is a highly effective procedure with a lower incidence of postoperative complications.

Keywords: ureteral resection; ureteroplasty; buccal mucosa graft; buccal ureteroplasty; renal descensus.

To cite this article
Guliev BG, Komyakov BK, Avazkhanov ZhP, Abdurakhmanov OSh. Comparative analysis of the outcomes of laparoscopic buccal ureteroplasty and renal descensus with ureteral resection for extensive strictures of the proximal ureter and ureteropelvic junction. *Urology reports (St. Petersburg)*. 2024;14(4):381–390. DOI: https://doi.org/10.17816/uroved633376

Received: 10.06.2024 **Accepted:** 17.12.2024 **Published online:** 30.12.2024

DOI: https://doi.org/10.17816/uroved633376

Сравнительный анализ результатов лапароскопической буккальной уретеропластики и низведения почки с резекцией мочеточника при протяженных стриктурах его проксимального отдела и пиелоуретерального сегмента

Б.Г. Гулиев [1, 2], Б.К. Комяков [1, 3], Ж.П. Авазханов [2], О.Ш. Абдурахманов [2]

[1] Северо-Западный государственный медицинский университет им. И.И. Мечникова, Санкт-Петербург, Россия;
[2] Городская Мариинская больница, Санкт-Петербург, Россия;
[3] Городская многопрофильная больница № 2, Санкт-Петербург, Россия

АННОТАЦИЯ

Актуальность. Рецидивные и протяженные стриктуры пиелоуретерального сегмента и проксимального отдела мочеточника являются сложной проблемой современной реконструктивной урологии, так как стандартные операции не всегда эффективны или технически выполнимы. В этих случаях приходится прибегать к таким сложным операциям на верхних мочевыводящих путях, как низведение почки с резекцией мочеточника и анастомозом «конец в конец» или замещение суженного участка трансплантатом из слизистой оболочки щеки.

Цель — провести сравнительный анализ результатов лапароскопической буккальной уретеропластики и низведения почки с резекцией мочеточника и анастомозом «конец в конец».

Материалы и методы. Выполнена пластика протяженной рецидивной стриктуры пиелоуретерального сегмента, верхней и средней трети мочеточника 72 пациентам. Мужчин было 35 (48,6 %), женщин — 37 (51,4 %), возраст — от 19 до 77 лет. Пациенты распределены на две группы: первая — 30 (41,6 %) человек, которым выполняли буккальную пластику мочеточника, вторая — 42 (58,4 %) человека, подвергнутых низведению почки с резекцией суженного участка мочеточника с анастомозом «конец в конец». Причиной сужения у 54 пациентов была предыдущая пиелопластика, у 12 — контактная уретеролитотрипсия в проксимальном отделе мочеточника, у 4 — «вколоченные» камни, у 1 — травма пиелоуретерального сегмента при лапароскопическом иссечении парапельвикальной кисты левой почки, у 1 — забрюшинный фиброз вследствие развития острого холецистопанкреатита. У 69 больных использовали лапароскопический, у 3 — робот-ассистированный доступ.

Результаты. Серьезное интраоперационное осложнение было у одного пациента из группы 2, у которого развилось кровотечение из нижнеполярного сосуда, потребовавшее конверсии доступа. В группе 1 достоверно меньше были длительность операций (197,1 ± 52,9 и 227,6 ± 30,6 мин, $p = 0{,}003$), объем кровопотери (93,0 ± 21,0 и 176,6 ± 44,6 мл, $p < 0{,}001$), количество послеоперационных осложнений (23,3 и 47,5 %, $p = 0{,}039$) и повторных операций (6,6 и 30,8 %, $p = 0{,}043$). Эффективность операций в группе 1 составила 93,4 %, в группе 2 — 71,5 % ($p = 0{,}0009$).

Выводы. Буккальная уретеропластика по сравнению с низведением почки, резекцией мочеточника и анастомозом «конец в конец» является высокоэффективным вмешательством с меньшим процентом послеоперационных осложнений.

Ключевые слова: резекция мочеточника; пластика мочеточника; трансплантат из слизистой оболочки щеки; буккальная уретеропластика; низведение почки.

Как цитировать

Гулиев Б.Г., Комяков Б.К., Авазханов Ж.П., Абдурахманов О.Ш. Сравнительный анализ результатов лапароскопической буккальной уретеропластики и низведения почки с резекцией мочеточника при протяженных стриктурах его проксимального отдела и пиелоуретерального сегмента // Урологические ведомости. 2024. Т. 14, № 4. С. 381–390. DOI: https://doi.org/10.17816/uroved633376

Рукопись получена: 10.06.2024 **Рукопись одобрена:** 17.12.2024 **Опубликована online:** 30.12.2024

ЭКО•ВЕКТОР

BACKGROUND

Over the past decades, the number of patients with extensive and recurrent ureteral strictures has increased, which is attributed to the expanded indications for surgical interventions on abdominal and pelvic organs, as well as the widespread adoption of endourological procedures for nephroureterolithiasis [1–5]. The choice of surgical approach depends on the cause, location, and extent of the stricture, as well as the functional state of the kidney. For long strictures of the distal ureter, Boari flap and psoas hitch procedures are performed [6–8]. Challenges arise in the surgical treatment of patients with extensive strictures of the ureteropelvic junction (UPJ) and the proximal ureter. In cases of recurrent UPJ strictures, a redo pyeloureteral anastomosis with renal descensus can be performed, and in rare cases, a Neuwirth procedure [9–12]. However, the effectiveness of these interventions remains low due to the use of poorly vascularized and scarred tissues as reconstructive material in the upper urinary tract (UUT). The literature contains few reports on the outcomes of renal descensus with end-to-end anastomosis, with small case series showing success rates of up to 88.9% [13, 14]. In recent years, ureteral reconstruction using a buccal mucosa or lingual mucosa graft has gradually been introduced into clinical practice. A limited number of centers have accumulated experience with such interventions, including laparoscopic and robot-assisted approaches [15–22].

The study aimed to compare the outcomes of buccal ureteroplasty and renal descensus with end-to-end ureteral anastomosis.

MATERIALS AND METHODS

This study includes the outcomes of reconstructive surgeries in 72 patients with extensive recurrent UPJ and proximal ureteral strictures, who underwent surgery at the Urology Center of Mariinsky City Hospital and the Urology Department of City Multispecialty Hospital No. 2 between 2010 and 2022. The cohort consisted of 35 men (48.6%) and 37 women (51.4%), with a mean age of 49 years (range: 19–77 years) and a body mass index (BMI) of 27 (25–29) kg/m^2. All patients had a history of endoscopic and reconstructive surgeries on the UUT. The causes of stenosis were as follows: previous pyeloplasty in 54, contact ureterolithotripsy in the proximal ureter in 12, impacted stones with stricture formation in 4, UPJ injury during laparoscopic excision of a parapelvic cyst of the left kidney in 1, and retroperitoneal fibrosis secondary to acute cholecystopancreatitis in 1 patient.

The patients were divided into two groups: Group 1 included 30 patients (41.6%) who underwent buccal mucosa ureteroplasty, and Group 2 included 42 patients (58.4%) who underwent renal descensus with resection of the stenotic ureteral segment and end-to-end anastomosis. In Group 1, 18 patients (60.0%) had undergone more than three previous interventions on the UUT, compared with only 8 patients (19.1%) in Group 2. A single previous surgery was performed in 24 patients (57.1%) in Group 1 and 4 patients (13.4%) in Group 2. Two previous interventions were recorded in 26.6% and 23.8% of cases, respectively. Taking into account that most of these patients had undergone multiple unsuccessful procedures to restore upper urinary tract patency, they were admitted to hospital with various drainage systems for urine diversion from the kidney. Preoperatively, all patients underwent renal ultrasound (US), abdominal computed tomography (CT), antegrade pyelography in cases with a nephrostomy, and retrograde ureterography. Renal function was further assessed using dynamic scintigraphy. Patient characteristics are presented in Table 1.

In Group 1, 27/30 patients (90.0%) underwent laparoscopic ureteroplasty for extensive UPJ and upper ureteral strictures using a buccal mucosa graft, whereas 3 patients (10.0%) underwent robot-assisted surgery. In Group 2, all patients underwent surgery via a laparoscopic approach. Postoperative management included antibiotic and infusion therapy. The study compared key parameters such as mean operative duration, blood loss volume, and complication rates. Postoperative complications were classified according to the Clavien–Dindo system. The ureteral stent was removed after 6 weeks, and nephrostomy was removed after adequate ureteral patency was confirmed via antegrade pyeloureterography. Patients were followed up using laboratory tests, kidney US, contrast-enhanced abdominal CT, and dynamic renal scintigraphy.

For data analysis, descriptive statistical methods were used, including the calculation of means, standard deviations, and standard errors of the mean for numerical variables. The statistical analysis was performed using Excel and Statistica 12.0. The data are presented as medians (*Me*) and quartiles [Q_1; Q_3]. The statistical significance was set at 5%.

RESULTS

All surgeries in Group 1 were successfully completed using a minimally invasive approach. In Group 2, conversion to open surgery was required in three patients due to extensive fibrosis, which rendered further laparoscopic intervention unfeasible in two cases, and intraoperative bleeding from lower pole vessels in one case. The surgical parameters for the procedures performed in both groups are presented in Table 2. Surgery time ($p = 0.003$) and blood loss volume ($p < 0.001$) were significantly lower in Group 1. A comparative analysis of postoperative outcomes, including hospital stay duration, renal US findings, postoperative complications classified

Table 1. Baseline preoperative characteristics of patients in the comparison groups

Таблица 1. Основные предоперационные показатели пациентов в сравниваемых группах

Parameter	Study group		Control group		*p*
	abs.	%	abs.	%	
Number of patients, *n*	30	100	42	100	–
Sex:					
• Male	18	60.0	17	40.5	0.102
• Female	12	40.0	25	59.5	
Years, age, *Me* [Q_1; Q_3]	52 [37; 61]		41 [32; 61]		0.395
Body Mass Index, kg/m^2, *Me* [Q_1; Q_3]	27 [24; 29]		28 [25; 29]		0.705
Stricture location:					
• Ureteropelvic junction	18	60.0	32	76.1	0.264
• Upper third	8	25.6	8	19.0	
• Middle third	4	13.4	2	4.9	
Side					
• Right	14	46.6	29	69.1	0.563
• Left	16	53.4	13	30.9	
Stricture length, mean, cm	4.2 ± 1.1		3.9 ± 0.55		0.132
Preoperative kidney drainage method:					
• Nephrostomy	14	46.6	11	26.2	0.135
• Stent	8	26.7	16	38.0	
• Stent and nephrostomy	2	6.7	–	–	
• No drainage	6	20.0	15	35.8	
Number of previous surgeries:					
• 1 surgery	4	13.4	24	57.1	0.002
• 2 surgeries	8	26.6	10	23.8	
• 2 surgeries and more	18	60.0	8	19.1	
Etiology					
Recurrent strictures, *n* = 18					
• After laparoscopic repair	14	46.6	14	33.3	0.013
• After open repair	4	13.4	22	52.4	
After endoscopic procedures (CLT, en-doureterotomy)	6	20.0	6	14.4	0.792
Long-standing ureteral stones with stricture	4	13.4	–	–	–
Ureteropelvic junction trauma during laparoscopic resection of a left kidney parapelvic cyst	1	3.3	–	–	
Retroperitoneal fibrosis due to acute cholecystopancreatitis	1	3.3	–	–	
Glomerular filtration rate, mL/min	85.6 ± 27.0		92.8 ± 23.3		0.231
Renal scintigraphy, *n* = 20					
• T_{max}, *Me* [Q_1; Q_3]	9.5 [6; 12]		9 [7; 12]		0.105
• $T_{1/2}$, *Me* [Q_1; Q_3]	31 [28; 34.5]		33 [29; 36]		0.405

by the Clavien–Dindo system, and the nature of repeat surgical interventions, is provided in Table 3. The hospital stay was significantly shorter in Group 1 than in Group 2 (6.0 ± 0.8 vs. 9.5 ± 1.1 days, $p < 0.001$). The overall complication rate was significantly lower in Group 1 (7 patients, 23.3%) compared to Group 2 (20 patients, 47.5%, $p = 0.039$). Grade II complications (Clavien–Dindo) were observed in 5 patients (16.6%) in Group 1 and 7 patients (16.6%) in Group 2. Grade IIIa complications occurred in 2 patients (6.6%) in Group 1 and 7 patients (16.6%) in Group 2. Grade IIIb complications were reported only in 4 patients (9.6%) in Group 2. Grade IV complications were not reported in Group 1, whereas they were noted in 2 patients (4.7%) in Group 2. Two patients in Group 2 required percutaneous nephrostomy due to urine leakage from the drain and exacerbation of chronic pyelonephritis (Grade IIIa, Clavien–Dindo). After nephrostomy placement, urine leakage ceased, and the retroperitoneal drain was removed. Among the two patients with Grade IV (Clavien–Dindo) complications, one developed severe bleeding from lower pole vessels of the right kidney on postoperative day 7, necessitating emergency nephrectomy with blood transfusion. This patient had previously undergone renal descensus with resection of a recurrent UPJ stricture, which developed following antevascular pyeloplasty. The second patient developed a postoperative urine leakage with breakthrough into the abdominal cavity, resulting in urinary peritonitis and urosepsis. Laparotomy was performed with abdominal and right-sided retroperitoneal drainage. In Group 2, five patients (11.9%) required percutaneous nephrostomy under local anesthesia due to exacerbation of chronic pyelonephritis associated with inadequate stent function. In two cases (4.7%), percutaneous drainage of urine leakage at the anastomosis site was performed. In four cases, ureteroscopy with stent replacement was required due to malfunctioning or distal displacement of the stent.

A comparative analysis of surgical outcomes was performed two months after the stent and nephrostomy removal, as well as at 12 and 24 months postoperatively. Follow-up assessments included kidney US, CT urography, renal scintigraphy, and estimation of glomerular filtration rate (GFR). Follow-up examinations focused on the degree of calyceal and pelvic dilation according to US data; GFR levels; findings from dynamic

Table 2. Comparative analysis of intraoperative parameters in the study groups
Таблица 2. Сравнительный анализ интраоперационных показателей пациентов в сравниваемых группах

Parameter	Study group		Control group		*p*
	Mean	Min.–Max.	Mean	Min.–Max.	
Surgery duration, min	197.1 ± 52.9	115–300	227.6 ± 30.6	170–350	0.003
Blood loss, mL	93.0 ± 21.0	50–140	176.6 ± 44.6	100–300	<0.001
Conversion to open surgery	0		3 (7.1%)		–

Table 3. Comparative analysis of postoperative parameters in the main and control groups
Таблица 3. Сравнительный анализ послеоперационных показателей у пациентов в основной и контрольной группах

Parameter	Study group, *n* = 30		Control group, *n* = 42		*p*
	abs.	%	abs.	%	
Postoperative hospital stay, average	6.0 ± 0.8		9.5 ± 1.1		<0.0001
Pre-discharge kidney ultrasound control					
• Calyces, *Me* [Q_1; Q_3]	10 [7; 15]		10.5 [5; 12]		0.9545
• Pelvis, *Me* [Q_1; Q_3]	19.5 [15; 23]		17 [15; 21]		0.5617
Total number of complications	7	23.3	20	47.5	0.0393
According to Clavien–Dindo classification:					
• Grade II	5	16.6	7	16.6	0.0393
• Grade IIIa	2	6.7	7	16.6	
• Grade IIIb	0	–	4	9.6	
• Grade IV	0	–	2	4.7	
Postoperative procedures:					
• Under local anesthesia	2	6.7	7	16.6	0.0437
• Under general anesthesia	–	–	6	14.2	

Table 4. Comparative analysis of long-term outcomes of buccal ureteroplasty in patient groups
Таблица 4. Сравнительный анализ отдаленных результатов буккальной уретеропластики в группах пациентов

Parameter		Study group, $n = 30$	Control group, $n = 42$	p
Glomerular filtration rate, mL/min:				
• Before surgery		85.6 ± 27.0	92.8 ± 23.3	0.231
• 2 months		89.0 ± 25.6	96.1 ± 23.0	0.224
• 12 months		93.2 ± 24.3	98.3 ± 21.5	0.352
• 24 months		96.0 ± 24.3	98.4 ± 22.9	0.671
Kidney ultrasound control:				
Calyces	• Before surgery	20.8 ± 3.7	19.4 ± 4.2	0.16
	• 2 months, *Me* [Q_1; Q_3]	8 [5; 12]	9 [6; 11]	0.766
	• 12 months, *Me* [Q_1; Q_3]	6 [4; 9]	9 [5; 12]	0.564
	• 24 months, *Me* [Q_1; Q_3]	6 [3.5; 7.5]	9 [4.5; 12]	0.773
Pelvis	• Before surgery	45.5 ± 8.9	42.1 ± 10.5	0.15
	• 2 months, *Me* [Q_1; Q_3]	18 [16; 23]	18 [15; 21]	0.610
	• 12 months, *Me* [Q_1; Q_3]	18 [15; 19]	19 [15; 24]	0.318
	• 24 months, *Me* [Q_1; Q_3]	18.5 [14; 19]	18 [14; 25.5]	0.773
Renal scintigraphy:				
• T_{max}, 12 months, *Me* [Q_1; Q_3]		5 [4.5; 7.5]	6 [5; 8]	0.245
• $T_{1/2}$, 12 months, *Me* [Q_1; Q_3]		22 [20; 24]	22 [20; 24]	0.105
Recurrence, *n*:				
• 12 months		2 (6.6%)	4 (9.5%)	0.0202
• 24 months		–	8 (19.0%)	

renal scintigraphy; presence of recurrent strictures at the reconstruction site (Table 4). Stricture recurrence was significantly higher in Group 2, with 12 patients (28.8%) affected, compared with Group 1. Within the first 12 months, four patients (9.5%) in Group 2 developed recurrent strictures. Between 12 and 24 months, an additional eight patients (19.0%) were diagnosed with recurrence. Six patients (14.2%) underwent endoscopic correction of the recurrent stricture, four patients (9.5%) required buccal mucosa ureteroplasty, two patients (4.7%) with extensive strictures (>5–6 cm) underwent ureteral substitution with a reconfigured ileal segment (Yang–Monti technique).

The results were classified as good when complete normalization of UUT urodynamics was achieved, along with nephrostomy removal. Satisfactory results were defined as persistent mild dilation of the pelvicalyceal system after surgery, but without drainage. The results were considered unsatisfactory in cases of recurrent strictures requiring repeat endoscopic or reconstructive surgery (Table 5). The analysis of long-term outcomes of buccal ureteroplasty revealed that recurrences were observed in two patients with proximal ureteral strictures >5 cm. In one patient, recurrence was diagnosed 8 months after the surgery. In another patient, recurrence was identified 13 months after the surgery. In both cases, the stricture length exceeded 5 cm (6 cm and 7 cm). Ureteroscopy revealed a short stricture in the lower part of the buccal mucosa graft-replaced segment of the ureter. Balloon dilation with stent placement was performed. Thus, it can be concluded that the greater the stricture length, the higher the risk of recurrence. This is explained by the fact that revascularization and engraftment decrease as the graft size increases. The findings also suggest that for strictures of 2.3–3.0 cm, anastomotic augmentation is the optimal approach; for strictures of 3.0–5.0 cm, onlay buccal mucosa graft ureteroplasty is recommended. The effectiveness of buccal ureteroplasty was 93.3%, and stricture recurrence was observed in 2 (6.7%) patients, who underwent transurethral balloon dilation with stent placement. The effectiveness in the control group was 71.5%, with stricture recurrence observed in 12 (28.5%) patients, who underwent reconstructive surgeries of varying complexity.

Table 5. Effectiveness of buccal ureteroplasty and repeat stricture resection with renal descensus

Таблица 5. Эффективность буккальной уретеропластики и повторной резекции стриктуры с низведением почки

Surgical effectiveness	Study group		Control group		*p*
	abs.	%	abs.	%	
Good results (complete normalization of upper urinary tract urodynamics, removal of nephrostomy stent)	25	83.3	20	47.7	0.009
Satisfactory results (reduction of renal calyceal and pelvic system dilation, removal of stent and nephrostomy)	3	10.0	10	23.8	
Unsatisfactory results (recurrence, repeated operations for recurrence correction)	2	6.7	12	28.5	
Total effectiveness	27	93.3	29	71.5	

DISCUSSION

Extensive recurrent strictures of UPJ and the proximal ureter require complex reconstructive procedures. Currently, one of the surgical correction methods for this pathology is kidney mobilization with renal descensus. However, this procedure is rarely performed as a standalone technique; instead, it is typically combined with resection of the stenotic ureteral segment followed by end-to-end anastomosis or with the Boari flap procedure [7, 8, 23, 24]. In 1964, Harada et al. first reported the successful mobilization and descensus of a kidney in a patient with an extensive stricture of the proximal ureter [25]. Later, Mauck et al. [14] published the results of renal descensus combined with the Boari flap procedure for long upper ureteral strictures in 12 patients. The authors concluded that kidney mobilization is valuable addition to surgical treatment for strictures in this location, achieving a success rate of 78% with a mean follow-up of 11 months. In 2016, M. Hofer et al. [13] reported surgical outcomes in 18 patients, where renal descensus was combined with uretero-ureteral anastomosis (4 cases), ureterocalicostomy (5 cases), Boari flap procedure (8 cases), and ileoureteral anastomosis (1 case). Of these 18 patients, 12 (66.8%) had recurrent strictures. The success rate of these combined procedures was 88.9% over a 50-month follow-up period. With the advancement of endoscopic surgery, renal descensus procedures have increasingly been performed laparoscopically. The first clinical case was published in 2011 by Sutherland et al., who performed laparoscopic renal descensus combined with a Boari flap in a 76-year-old patient [26]. However, such reports remain scarce in the literature. In recent years, studies on the outcomes of onlay substitution ureteroplasty using a buccal mucosa graft for ureteral reconstruction have emerged. Experimental studies on ureteral replacement using a buccal mucosa graft were conducted as early as 1983 in baboons [27]. The first clinical report of a series of six cases was presented by Naude in 1999. In four patients, the stenotic ureteral segment was incised and augmented with a buccal mucosa patch, in one case, augmentation ureteroplasty was performed at the site of a ureteral anastomosis, and in another, the stricture was replaced with a tubularized buccal graft. In all cases, the surgical site was wrapped with an omental flap. During a median follow-up of 24 (2–72) months, no recurrences were observed, and no additional interventions were required [28].

Recent studies focus primarily on laparoscopic and robot-assisted buccal ureteroplasty [15–22, 29]. Lee et al. [4] reported a multicenter experience with robot-assisted buccal ureteroplasty in 54 patients, representing the largest series of such procedures to date. Onlay ureteroplasty was performed in 79% of cases, whereas the remaining patients underwent augmented anastomotic plastic surgery. At a mean follow-up of 26 months, 90% of patients demonstrated successful clinical and radiographic outcomes. Over the past 10 years, our clinic has performed laparoscopic and robot-assisted buccal ureteroplasty in 30 patients. The procedure effectiveness was 93.3% over a median follow-up period of 17.2 months [29].

Thus, our findings indicate that ureteroplasty using a buccal mucosa graft for extensive UPJ and proximal ureteral strictures is a minimally invasive and highly effective surgical intervention. It is indicated for patients with long-segment strictures, in cases where reconstructive procedures using native UUT tissues are technically unfeasible. Experimental study demonstrated the transformation of stratified squamous epithelium into transitional epithelium, identical to ureteral epithelium. However, similar histological changes were not observed in the clinical group, which is explained by differences in tissue metabolism and regeneration between experimental animals and humans [30]. Our comparative analysis of buccal ureteroplasty and renal descensus with end-to-end anastomosis demonstrated that Group 1 patients had significantly better outcomes in terms of surgery time ($p = 0.003$), blood loss ($p = 0.001$), complication rate ($p = 0.039$), and surgical success rate ($p = 0.009$).

CONCLUSION

Extensive recurrent strictures of UPJ and the proximal ureter are indications for reconstructive surgeries such as renal descensus with end-to-end anastomosis and buccal ureteroplasty. Ureteroplasty for long UPJ and proximal ureteral strictures using a buccal mucosa graft can be considered a highly effective procedure, demonstrating a lower complication rate compared to renal descensus with end-to-end anastomosis. In cases where these interventions prove ineffective, the Yang–Monti ileal ureteroplasty may be the treatment of choice.

ADDITIONAL INFO

Authors' contribution. All authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study. Personal contribution of each author: B.G. Guliev — development of the design of the study, analysis of the data obtained, editing the text of the manuscript; B.K. Komyakov — development of the design of the study, editing the text of the manuscript; Zh.P. Avazkhanov — collection of material, writing the text of the manuscript, manuscript design, analysis of the data obtained; O.Sh. Abdurakhmanov — collection of material, manuscript design.

Funding source. This study was not supported by any external sources of funding.

Competing interests. The authors declare that they have no competing interests.

Ethics approval. The present study protocol was approved by the local Ethics Committee of the North-Western State Medical University named after I.I. Mechnikov (No. 10, dated 2019 Oct 30).

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией. Личный вклад каждого автора: Б.Г. Гулиев — разработка дизайна исследования, анализ полученных данных, редактирование текста рукописи; Б.К. Комяков — разработка дизайна исследования, редактирование текста рукописи; Ж.П. Авазханов — сбор материала, написание текста и оформление рукописи, анализ полученных данных; О.Ш. Абдурахманов — сбор материала, оформление рукописи.

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

Этический комитет. Протокол исследования был одобрен локальным этическим комитетом СЗГМУ им. И.И. Мечникова (№ 10 от 30.10.2019)

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AUTHORS' INFO

***Bahman G. Guliev,** MD, Dr. Sci. (Medicine), Professor;
address: 41 Kirochnaya st., Saint Petersburg, 191015, Russia;
ORCID: 0000-0002-2359-6973; eLibrary SPIN: 8267-5027;
e-mail: gulievbg@mail.ru

Boris K. Komyakov, MD, Dr. Sci. (Medicine), Professor;
ORCID: 0000-0002-8606-9791; eLibrary SPIN: 7864-9123;
e-mail: komyakovbk@mail.ru

Zhaloliddin P. Avazkhanov, MD, Cand. Sci. (Medicine);
ORCID: 0000-0003-3824-2681; eLibrary SPIN: 5012-4021;
e-mail: professor-can@mail.ru

Oibek Sh. Abdurakhmanov, MD; ORCID: 0009-0002-0350-3538;
eLibrary SPIN: 7608-3408; e-mail: ovshen_19@mail.ru

ОБ АВТОРАХ

***Бахман Гидаятович Гулиев,** д-р мед. наук, профессор;
адрес: Россия, 191015, Санкт-Петербург, ул. Кирочная, д. 41;
ORCID: 0000-0002-2359-6973; eLibrary SPIN: 8267-5027;
e-mail: gulievbg@mail.ru

Борис Кирилович Комяков, д-р мед. наук, профессор;
ORCID: 0000-0002-8606-9791; eLibrary SPIN: 7864-9123;
e-mail: komyakovbk@mail.ru

Жалолиддин Пайзилидинович Авазханов, канд. мед. наук;
ORCID: 0000-0003-3824-2681; eLibrary SPIN: 5012-4021;
e-mail: professor-can@mail.ru

Ойбек Шухратович Абдурахманов; ORCID: 0009-0002-0350-3538;
eLibrary SPIN: 7608-3408; e-mail: ovshen_19@mail.ru

* Corresponding author / Автор, ответственный за переписку