Endoscopic Versus Open Approach of Bladder Cuff and Distal Ureter in the Management of Upper Urinary Tract Transitional Cell Carcinoma

Üst Üriner Sistemin Transizyonel Hücreli Kanserlerinde Distal Üreter ve Mesane Kafı Çıkarılması İçin Uygulanan Açık Cerrahi ile Endoskopik Yaklaşımın Karşılaştırılması

Turgut Yapanoglu[1], Huseyin Kocaturk[1], Ozkan Polat[1], Azam Demirel[1], Guray Okyar[1]

[1]Atatürk University, Faculty of Medicine, Department of Urology, Erzurum, Turkey

Correspondence to: Turgut Yapanoglu, Atatürk University, Faculty of Medicine, Department of Urology, 25270, Erzurum, Turkey.
Phone: +90.532.4756205, Fax: +90.442.3166340, e-mail: turgutyapanoglu@mynet.com

Abstract

Objective: Nephroureterectomy with the removal of the ipsilateral ureteral orifice and bladder cuff en bloc remains the gold standard treatment for upper urinary tract urothelial cancer. The distal ureter can be removed with the open surgical technique or endoscopic approach. We compared the outcomes of the endoscopic approach with those of conventional open surgery on the distal ureter.

Materials and Methods: We collected data from the charts of 30 patients who underwent radical nephroureterectomy at our clinic from January 1997 to January 2007 for upper urinary tract urothelial carcinoma. The patients were divided into two groups according to procedure performed on the distal ureter. Group I (n:12) was comprised of patients who underwent an open surgical procedure, and group II (n:18), was comprised of patients who underwent an endoscopic approach. Both groups were compared in terms of operative time, blood loss, transurethral catheter duration and duration of hospital stay.

Results: Patient age and tumor location showed no significant differences between the two groups. The operative time was significantly longer in group I than group II (181 versus 128 minutes; $p<0.05$). On the other hand, the estimated blood loss, transurethral catheter duration and duration of hospital stay were significantly lower in group II (205 mL versus 435 mL, 5 versus 8.5 days and 5.6 versus 9.2 days, respectively; $p<0.05$).

Conclusion: The results of our study show that the endoscopic approach is less invasive than open surgery on the distal ureter. This procedure can easily be performed in the management of upper urinary tract urothelial carcinoma.

Keywords: Urothelial carcinoma, Endoscopic approach, Open surgery, Distal ureter

Özet

Amaç: *Üst üriner sistemin ürotelial kanserlerinde,nefroüreterektomi ile birlikte, aynı taraf üreter orifisi ile mesneden kaf çıkarılması altın standart tedavi yöntemidir. Distal üreter açık cerrahi teknikle veya endoskopik yaklaşımla çıkarılabilir. Biz distal üreter çıkarılması için endoskopik yaklaşım ile geleneksel açık cerrahinin sonuçlarını karşılaştırmayı amaçladık.*

Gereç ve Yöntem: *Biz, Ocak 1997 ile Ocak 2007 yılları arasında kliniğimizde üst üriner system ürotelial karsinom nedeniyle radikal nefroüreterektomi yapılmış 30 hastanın sonuçlarını değerlendirdik. Hastalar distal üreter için yapılan tedavi ye gore iki gruba ayrıldı. Grup I (n:12) distal üreter için açık cerrahi yaılan hastalardan oluşturuldu, Grup II (n: 18), distal üreter için endoskopik yaklaşım yapılan hastalardan oluşturuldu. Her iki grup operasyon zamanı, kan kayıbı, transüretral kateterizasyon ve hastanede kalış süresi bakımından karşılaştırıldı.*

Bulgular: *Her iki grup arasında , hastaların yaşı ve tümör lokalizasyonu bakımından anlamlı fark tespit edilmedi. Operasyon süresi; grup I'de, grup II'den anlamlı oranda yüksek bulundu (181 dakikaya karşılık 128 dakika, $p<0,05$). Diğer taraftan, hesaplanan kan kaybı, transüretral kateterizasyon ve hastanede kalış süresi grup II'de anlamlı derece düşük bulundu (205 mL karşılık 435 mL, 5 gün karşılık 8,5 gün ve 5,6 gün karşılık 9,2 gün, sırasıyla $p<0,05$).*

Sonuç: *Bizim çalışmamızın sonucu; üst üriner sistem ürotelial kanserlerinde, distal üreter için endoskopik yaklaşımın daha az invazif ve kolay yapılabilir bir tedavi olduğunu göstermiştir.*

Anahtar Kelimeler: *Ürotelial kanserler, Endoskopik yaklaşım, Açık cerrahi, Distal üreter*

Introduction

Radical nephroureterectomy, including the entire excision of the ipsilateral ureter and enclosing of the bladder cuff, is the standard treatment for upper tract transitional cell carcinoma (TCC) [1]. Either two skin incisions (flank and lower abdominal) or an extended flank incision are performed for this procedure. Surgical morbidity is high for both procedures [1].

Minimally invasive techniques are based on the endoscopic detachment of the distal ureter in conjunction with standard nephrectomy [2]. A ureteral catheter is inserted at the start of the procedure. A resectoscope is then used to excise the bladder cuff, thus releasing the distal ureter [3].

We compared both procedures with regard to operative time, blood loss, time of transurethral catheter removal and duration of hospital stay.

Materials and Methods

A retrospective review of patients treated for upper tract TCC at our clinic from January 1997 to January 2007 was conducted. Thirty patients were identified using surgical logs. The patients were divided into two groups: Group I patients (n: 12) underwent an open surgical procedure on the distal ureter, whereas Group II patients (n:18) underwent an endoscopic procedure on the distal ureter. Both groups were compared statistically in terms of the duration of operation, blood loss, time of transurethral catheter removal and duration of hospital stay.

Surgical Techniques:

Open surgical technique

After induction of general anesthesia, standard nephrectomy was performed using a flank incision. The renal fossa was opened. After ligation of the renal vessels, the kidney was dissected and removed with the perirenal fat. The position was changed, and a Gibson incision was performed to remove the distal ureter and bladder cuff retroperitoneally. The bladder was opened, and the ureteral catheter was placed into the ipsilateral ureteral orifice. The ureteral orifice was excised along with a rim of bladder tissue. The bladder incisions were then closed with absorbable sutures in the usual 2-layer, watertight manner [4].

Endoscopic surgical technique:

After induction of general anesthesia, the patient was placed in the dorsal lithotomy position. A ureteral catheter was then placed into the ipsilateral orifice. A Collins knife was used to dissect the bladder cuff and ureter. The intramural ureter and bladder cuff were completely detached en bloc from the bladder. The dissection continued, with the Collins knife cutting into the pelvic extraperitoneal fatty tissues. After the position was changed, standard nephrectomy was performed using a flank incision. The distal ureter was identified and dissected toward the bladder. The specimen was removed and then isolated en bloc with a border of the bladder cuff [5].

Table 1. Characteristics of patients from both groups.

Variable	Open surgical technique	Endoscopic technique
Age (years)	41 (range:25-60)	40 (range: 17-64)
Gender (M/F)	7/5	10/8
Tumor location		
Pelvis	6	10
Ureter	4	5
Pelvis and Ureter	2	3

The data in the study are expressed as the mean ± the standard deviation. The comparisons between the two groups were done using the chi-square test or independent student's t test. A difference equating to a p-value less than 0.05 was considered statistically significant. All analyses were performed with the statistical package for Social Sciences software, version 11 (SPSS, Chicago, III).

Results

The results of 30 patients (17 male and 13 female) are given. Patients ages varied between 17 and 64 years (mean: 48.46±20.56 years). There was no statistically significant difference between the two groups in terms of patient age, sex, tumor location or tumor size (Table 1).

As shown in Table 2, Group I required a longer operation time (mean operation time of 181 minutes versus 128 minutes for Group II; $p<0.05$). The mean estimated blood loss in Group II was significantly less than that in Group I (205 mL versus 435 mL; $p<0.05$). The mean duration of urethral catheterization and hospital stay in Group II was significantly less than that of Group I (5 versus 8.5 days; $p<0.05$ and 5.6 versus 9.2 days; $p< 0.05$, respectively). The patients were followed for a mean of 18 months (range: 6-30 months). After a mean of 18 months of follow-up, there were no postoperative complications associated with any of the patients in either group.

Discussion

Upper-tract transitional cell carcinoma accounts for approximately 5% of all urothelial cancer [5]. Removal of the entire urothelium on the ipsilateral side, (including the kidney, ipsilateral ureter and associated bladder cuff) currently offers the best chance of cure. Hence, this procedure has long been the gold standard for treatment [6,7]. Nevertheless, management of the distal ureter is not standardized.

Institutionally, standard nephroureterectomy requires two incisions: one permits approach of the kidney, and the other dissects the distal ureter and bladder cuff. Alternatively, a single lumboabdominal incision can embrace both surgical fields [2,7]. The endoscopic approach to distal ureter was first described in

1952 by Mcdonald et al. prior to nephroureterectomy using a single lumbar incision [8]. It was subsequently popularized by Abercrombie et al.in 1972 [9]. This technique is quite simple and quick, and it can be used easily during operation.

The major criticisms of that technique are 1) tumor seeding due to the presence of extravasate and 2) the greater incidence of bladder tumor recurrence at the site of ureteral resection [7,8]. In a study performed by Salvador-Bayyarri et al. in 2002 [7], the results of the endoscopic approach were compared with those of standard nephroureterectomy. The rates of bladder recurrence were 34.5% and 39%, respectively, with no statistically significant difference. It was concluded that the endoscopic approach did not increase the risk of tumor recurrence after nephroureterectomy for upper urinary tract carcinoma [2]. Tumor recurrence was not determined any of our patients during a mean of 18 months of follow-up.

The intraoperative endoscopic approach was compared to open surgery on the distal ureter. The most significant advantages of this technique are the decreased operative time and minimal blood loss [1,3]. Furthermore, the postoperative course is easier in the endoscopic approach, as evidenced by the significantly less frequent urethral catheterization, shorter hospital stay and convalescence [1]. In our study, we also found that the operative time, duration of urethral catheterization, hospital stay duration, and blood loss were significantly lower after the endoscopic approach.

Table 2. Comparison of results from both groups in the management of the bladder cuff and distal ureteral removal.

Variable	Open surgical technique	Endoscopic technique
Patients (n)	12	18
Mean operative time (min)	181	128
Mean blood loss (mL)	205	435
Mean duration of urethral (days) Catheterization	5	8.5
Hospital stay (days)	5.6	9.2

In conclusion, the endoscopic distal ureteral approach in upper urinary tract carcinoma is a simple, effective and safe procedure that does not increase the rate of bladder or loco-regional recurrence.

Conflict interest statement The authors declare that they have no conflict of interest to the publication of this article.

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