

MINIMIZING COMPLICATIONS DURING RETROPUBIC RADICAL PROSTATECTOMY – IS URETERAL STENTING NECESSARY?

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Abstract

Objectives and Aims: To avoid damage to the ureters during bladder neck preparation in radical prostatectomy for prostate cancer, it may be helpful to insert ureteral stents temporarily or to intravenously administer indigo carmine dye for enhanced visualisation of ureteric orifices. We evaluated our bladder neck preserving technique at radical prostatectomy with regard to ureteric injuries.

Patients and Methods: We analysed 369 consecutive radical prostatectomies operated in our clinic in a bladder neck preserving technique. The following parameters were assessed in this retrospective study: number of prophylactic ureteric stent insertions, application of indigo carmine dye, observed injuries of the ureters by the surgeon, postoperative increase of serum creatinine and postoperative status of kidney ultrasound.

Results: In 7/369 prostatectomies (1.90%) a ureteric stent insertion was performed, indigo carmine was not applied to any patient at all, yet no intraoperative injury of a ureter was observed by a surgeon. No revision was necessary due to a ureteral injury within the observation period of one year after surgery. In 17 patients with preoperative normal creatinine value a pathological value was observed on the first postoperative day (mean 1.4 mg/dl). In these patients no consecutive postrenal acute renal failure was observed, no hydronephrosis was monitored by ultrasound and no further intervention was necessary.

Conclusions: Bladder neck preserving operation technique does not implicate the need of prophylactic ureteric stent insertions and has no higher incidence of ureteric injuries.

Key words: prostate cancer; retropubic radical prostatectomy; intraoperative complication; ureter

INTRODUCTION

Cancer of the prostate (PCa) is the most common solid neoplasm in Europe with an incidence of 21.400 cases per 100.000 men [1]. In Germany, every year PCa is newly diagnosed in 58.000 men with an average age of 69 years and is currently the third most common cause of cancer death [2]. PCa in Germany is accounting for 10.1% of all tumor associated deaths [2]. Different treatment modalities are available for non-meta-

static PCa. Besides radical prostatectomy (open retropubic / open perineal / laparoscopic / robot-assisted), other treatment options include percutaneous radiation, brachytherapy, watchful waiting or active surveillance [3]. Radical prostatectomy, however, is the only treatment that has shown an improved cancer-specific survival compared to conservative management [4]. The open retropubic radical prostatectomy was developed over 60 years ago and implies the removal of the entire prostate gland between the urethra and the bladder [5]. Despite improvements of the surgical approach like the 'nerve sparing' prostatectomy [6] there still are intra- and perioperative complications, e. g. prolonged urine leakage of the vesicourethral anastomosis in up to 15.4% of patients [3]. To avoid injuries of the ureteric orifices many surgeons use temporary ureteral stents or administer intravenously indigo carmine dye for enhanced visualisation especially when encountering an intravesical middle lobe during prostatectomy [7, 8]. To improve early continence and reduce prolonged urine leakage of the vesicourethral anastomosis we use a bladder neck preserving operation technique [9]. The aim of the presented retrospective study was to investigate, if bladder neck preservation during open radical prostatectomy in a high volume center is associated with a higher risk of ureteral injuries and if additional procedures like temporary ureteral stenting or administration of indigo carmine dye for visualisation of the ureteric orifice are necessary.

PATIENTS AND METHODS

369 consecutive patients with histological confirmed PCa were treated in our hospital by open retropubic prostatectomy as described before [10, 11] and included in this retrospective study. Seven different surgeons with an experience of more than 100 radical prostatectomies each performed surgical intervention. All patients underwent routine preoperative examinations including abdominal ultrasound, chest X-ray and blood tests including creatinine value. On the first day after surgery, blood examinations were repeated routinely to exclude significant bleeding or other perioperative complications (e. g. urine leakage due to ureteral injury or an insufficient vesicourethral anastomosis). If blood testing showed pathological values or the patient was clinically conspicuous, the test was repeated latest the next day. In our laboratory standard, for men

a creatinine level of 0.5 to 1.2 mg/dl is defined as non-pathological. Complete pre- and postoperative laboratory data were available for 263/369 patients. After discharge of hospital, the follow-up was performed by telephone interviews either of the patient, the visiting urologist or general practitioners one year after surgery. Specifically, every patient with pathological creatinine value during hospital stay underwent repeated blood testing. Furthermore it was investigated if the patient underwent any additional surgical procedure (e. g. ureteral stenting, percutaneous nephrostomy or ureteral reconstruction) due to a ureteral injury during prostatectomy.

STATISTICAL ANALYSIS

All data are expressed as mean \pm standard error of mean (SEM) calculated by using standard statistical methods.

RESULTS

Mean age at first diagnosis of prostate cancer was 63.7 ± 0.3 years. During radical prostatectomy no surgeon observed any intraoperative injury of a ureter; neither ureteral reconstruction was performed. Indigo carmine dye was not applied at all. In 7/369 prostatectomies (1.90%) a ureteric stent was inserted temporarily and removed either before closure of the last anastomosis sutures or 6 – 8 weeks after radical prostatectomy by transurethral cystoscopy. No patient underwent any additional surgery due to a ureteral injury during follow-up.

Complete laboratory data were available of 263/369 patients (71.3%). In 17/263 (6.5%) patients with preoperative normal creatinine value a pathological value was observed on the first postoperative day. Mean creatinine value in these patients before surgery was 1.1 ± 0.02 mg/dl, postoperatively 1.4 ± 0.04 mg/dl. Acute postrenal renal failure was excluded by abdominal ultrasound examination, a significant hydronephrosis was not seen in any case. All pathological creatinine values returned to preoperative level without any surgical intervention.

DISCUSSION

During the last decades, radical prostatectomy has become a standard treatment for localized prostate cancer. In high volume surgical centers complication rates tend to be lower than in small centers with fewer than 50 prostatectomies per year [12, 13]. With an evolving surgical technique, functional long-term results of continence and erectile function have dramatically improved [6]. For selected patients, continence rates of up to 99% after one year [9] and restored erectile function in up to 50% are reported [14]. Despite good functional long-term results there is still a risk of perioperative complications. In experienced hands the total perioperative complication rate may be as low as 1.8% – 10% [15, 16]. The most common intraoperative complication is significant hemorrhage arising from venous structures and requiring blood transfusion [7]. Mean blood loss in historic series is reported

to be as high as 1500 ml [15], more recent publications report 150 – 300 ml for experienced surgeons [11, 17]. Besides hemorrhage, rectal injury and obturator nerve injury during pelvic lymphadenectomy are rare complications in recent series [8]. Ureteral injuries are reported in 0 – 4.7% [15-21]. There are no detailed reports about predisposing factors for ureteral damage. The injuries seem to occur most often during dissection of the posterior aspect of the bladder neck especially in patients with significant benign prostatic hyperplasia and J-hooking of the ureters [7, 8]. In our own series consisting of 369 consecutive prostatectomies there were no ureteral injuries noticed. During prostatectomy in seven patients a ureteral stent was temporary used to protect the ureteral orifice during dissection of the bladder neck. All surgical procedures could be performed without obvious intraoperatively injuries to the ureter and without the need for a ureteral reconstruction. Indigo carmine dye was not applied at all, which might be due to personal preference of the urologic surgeons. Summarizing our data, there were no ureteral injuries and the use of ureteral stents was limited to single cases. This might indicate that in experienced hands a routinely stenting of ureters during prostatectomy is not necessary.

A limitation of the study is its retrospective nature. We did, however, include only patients with a detailed follow-up.

CONCLUSIONS

In a high volume surgical center setting, the risk for a ureteral injury during open radical prostatectomy is very low. Routinely performed ureteral stenting is not necessary but may be helpful in selected patients.

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