Results of application of orthotopic urine diversion according to Studer

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INTRODUCTION

Over the last ten years, total cystectomy is increasingly more frequent therapeutic choice in T2 stage of the disease, which resulted in better oncological results of the surgery and longer survival. Survival of the patients was also influenced by selection of patients free of comorbidities significant for the surgical treatment. Prolonged survival of the patients subjected to radical cystectomy due to the infiltrative carcinoma of the urinary bladder had led to the increased need of development of orthotopic bladder that will enable preservation of the upper urinary ways for the extended period of time. Orthotopic bladder with afferent tubular segment in which the ureters are implanted without antireflux mechanism has been introduced into the practical use in 1984 by Studer and collaborators1.

MATERIAL AND METHODS

The total of 12 patients underwent surgical treatment in the period 1998-2007. Cystoprostatectomy and pelvic lymphadenectomy were performed according to the standard protocol in all the patients. Neobladder is constructed in the following way: 55 cm long ileal segment is isolated 15-25 cm away from the ileocecal valve. The ureters are implanted termino-laterally into the 15 cm long afferent non detubularized segment of ileum that remains tubularized to be blindly closed at the proximal end. The left ureter is passed below the mesosigmoid. Low-pressure reservoir is created using Goodwin cup-patch technique. In this way, a spheric low-pressure reservoir is created with the initial capacity of 120 ml. The reservoir is orthotopically placed into the small pelvis to be anastomosed with the membranous urethra using 4-6 interrupted 3/0 sutures. Three-arm balloon catheter is postoperatively retained in the ileal bladder as well as su-
prapubic cystostomy through which, the bladder is rinsed with physiological saline in 3-hour intervals for the initial 10 days in order to prevent catheter obstruction by the intestinal mucus, which may result in overfilling of the reservoir and separation of the anastomotic sutures. After removal of the catheter, the patients are trained to perform exercises aimed at strengthening of the pelvic floor muscles and to void in 3-hour intervals. Follow-up examinations were carried out one month, three months and 6 months after the surgery. The follow-ups included determination of serum creatinine level, ultrasound monitoring of the upper urinary ways condition in three-month intervals and pyeloureterography with intravenously applied contrast medium one year after the surgery. Immediately before the follow-up examinations, the patients were asked to complete voiding and incontinence onset diary.

RESULTS

All the patients were surgically treated in general anesthesia. They were averagely aged 62.4 years (range 50-67). In 7 patients, clinical stage of the disease was T2N0M0 while 5 had T3aN0M0 stage. Unilateral nerve sparing operation was performed in 4 patients while bilateral one was performed in two patients. Pathological stage pT2N0 was evidenced in 3 patients, pT3a in 8, while pT3bN1 was found in one. The average duration of surgery was 230min with average bleeding of 900ml. Bilateral stasis was preoperatively present in one patient, while one of the patients underwent resection of the terminal ureter due to presence of the tumor in it. Over the postoperative course, the probes were removed on the day 14 at the average, the catheter on the day 18 while the patients were discharged on the postoperative day 20. The average follow-up period was 46 months. Contrast imaging performed a year after the surgery evidenced in 14/24 patients (58%) different degrees of dilatation, while significant dilatation in the form of thickening of the fornix was found in 4 out of 22 units. The complete exclusion of the kidney with tumor infiltration of the ureteral orifice. Significant obstruction of the ureteroileal anastomosis was found in 4 renal units and it was resolved by antegrade balloon catheter dilatation. In only one case, i.e., in the patient with tumor infiltration of the ureteral orifice, serum creatinine was above 200mmo/l four years after the surgery. Diurnal continence was established in all the patients within the initial 6 postoperative months. Nocturnal incontinence persisted in 4 patients in mild form. Stenosis of the urethovesical anastomosis was the cause of urine retention in 4 patients and it was resolved endoscopically, while in other two patients retention was the result of insufficient emptying of the reservoir over the initial 6 months, and therefore, catheterization with the open drainage system was applied, and thereafter, the catheters were removed and the patients were advised to void in 3-hour intervals (Table 1.)

Choice of the optimal technique for ureteral implantation into the neobladder enabling preservation of the upper urinary ways has remained controversial. The results of our study as well as the results obtained in Studer’s series\(^6)\) evidenced that antireflux mechanism is not necessary. Our results are comparable to those reported by Studer, however it is necessary to stress the importance of comparison of their work with the work of other authors with respect to the number of patients and duration of follow-up period (129 patients with follow-up period of 13 years\(^7)\). Although majority of the patients from the Studer’s series\(^2\) developed after 5 years certain degree of upper urinary tract dilatation (78%), evidenced in our series in 58% after one-year follow-up, only 2% of patients from Studer’s series and 1.8% of patients from our series developed strictures of ureteroileal anastomoses, which is less frequent in comparison to the results reported by authors who have used antireflux mechanisms of implantation\(^3,4,5,6,7\). Ureteral implantation into the afferent curvature has one additional advantage over the ureteronevesical anastomosis. i.e., possibility of removal of the distal ureter that may be infiltrated with urinary bladder tumor or affected with transitional cell carcinoma of the ureter.

High diurnal continence rate evidenced in our series in comparison to previous reports\(^8)\) which is consistent with the findings reported by Studer et al., is influenced by a number of factors. Nerve sparing surgery was performed in 50% of cases, as well as ureteral and sphincter preservation, preservation of the puboprostatic ligaments, while

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**TABLE 1**

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<thead>
<tr>
<th>REVIEW OF POSTOPERATIVE COMPLICATIONS</th>
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<tbody>
<tr>
<td>GUT dilatation (IVU)</td>
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<tr>
<td>Stenosis of ureteroileal anastomosis</td>
</tr>
<tr>
<td>Renal exclusion</td>
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<tr>
<td>Diurnal incontinence</td>
</tr>
<tr>
<td>Nocturnal incontinence</td>
</tr>
<tr>
<td>STenosis of ureterovesical anastomosis</td>
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<td>Irregular emptying of reservoir</td>
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CONCLUSION

The most important factor determining long-term success of the bladder substitution is patient compliance with long-term follow-up. Appropriate physical skills and mental capacities are essential for understanding of the new bladder and its method of functioning. If the patients are lacking the above characteristics, other urine diversion method should be applied. The advantage of implantation into the afferent curvature over the antireflux mechanism has been confirmed in our study by low percent of stenoses. Postoperative treatment of the patients is equally important as surgical construction if long-term results are to be achieved.

SUMMARY


Kljуčne rečи: Ilealna, neovezika, ne-antirefluks.

REFERENCES