Non-Invasive Stent Removal after Ureteroneocystostomy in Pediatric Patients: Long-Term Results

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Abstract

Objective: Among the more serious problems in urological interventions among the pediatric age group is the requirement of general anesthesia. The advantages of removing a double-J stent (DJS) without anesthesia in ureteroneocystostomy (UNC) operations among children were investigated in this study.

Patients and Methods: In all, 25 patients who underwent UNC surgery between November 2016 and November 2018 were retrospectively divided into two groups according to the method used for the removal of the DJS. In Group 1, the stent was tied to the urethral catheter by a suture and retrieved postoperatively on the fourth day without anesthesia and cystoscopy. In Group 2, we inserted the stent according to the classical method with no suturing to the catheter and removed it 3 to 4 weeks after the first operation, with cystoscopy under anesthesia.

Results: A total of 16 girls and 9 boys were included in the study. The mean age was 4.3 and 6.3 years in groups 1 and 2, respectively. We did not observe statistically significant difference between the groups in long-term renal function or hydronephrosis regression.

Conclusion: We consider that the removal of a stent placed in pediatric intravesical UNC operations without anesthesia and cystoscopy is less invasive and affords safety and long-term results comparable to the standard method.

Key words: Catheter, Vesico-ureteral Reflux, Stent, Pediatrics

Introduction

In anastomotic urological surgeries performed in pediatric patients, double-J stent (DJS) application is the most common procedure and is almost routine. Stents play an important role in preventing postoperative obstruction or leakage of urine through anastomosis. There are controversies in the literature regarding whether ureteral stenting in patients undergoing transtrigonal ureter reimplantation is required and how long it should remain in patients in whom it have been applied. In general, surgeons tend to leave the stent for an extended time (approximately 1 month) because of safety, while others prefer to remove the stent after a short time (3-7 days), and yet others do not prefer stenting. [1,2] However, unlike with adults, stent removal requires anesthesia and a new operation. In addition, due to dysuria and hematuria complaints, antibiotic treatment may be given unnecessarily, with the assumption that there is a urinary tract infection. Apart from these concerns, if the stent is left in place for a lengthy period, stent migration and encrustation are additional complications that can be seen. Considering that all these complications are corrected under anesthesia in baby and pediatric patients, it may be seen how difficult the process can be. Therefore, to avoid further interference, new methods have been presented in the literature. In this study, the benefits and results of removing a DJS without anesthesia in ureteroneocystostomy (UNC) operations on children were investigated.

Patients and Methods

This cross-sectional retrospective study was performed between November 2016 and December 2018. In all, 25 patients, regardless of age or sex, who underwent intravesical UNC surgery due to vesicoureteral reflux in south-eastern Turkey were included to the study. Ureteral tailoring was not performed on any of the patients. Patients were divided into two groups according to the method of DJS removal performed during surgery (unilateral/bilateral) for intravesical technical procedures in a pediatric urology department. One end of the DJS of 14 patients in the first group was connected to the urethrally inserted catheter with the help of its own thread or a suture (Figure 1 and 2). Patients in this group were hospitalized for 3 days with probes. At the end of the fourth day, when the catheter was removed, the DJS was removed spontaneously, and no anesthesia was required. The stents of the 11 patients in Group 2 were taken as standard and removed under anesthesia 3 to 4 weeks after surgery. All patients in Group 2 received antibiotic prophylaxis until the stents were removed. Patients in Group 1 did not receive additional treatment after discharge. Patients in both groups were called for follow-up on the 15th day, first month, third month, sixth month, twelfth month, and eighteenth month after the operation. All patients underwent Tc-99m Dimercaptosuccinic Acid (DMSA) scintigraphy 6 months and 1 year after the operation. Ultrasonography was performed during all follow-ups to monitor for hydronephrosis. At all follow-ups, the two groups were compared for the presence of infection, operation success, the need for additional treatment, and whether complications occurred.

Exclusion criteria of the study were any previous antireflux surgery for vesicoureteral reflux, performance of any extravesical surgical technique of ureteral reimplantation, and patients who could not be followed properly.

Results

A total of 16 girls and 9 boys were included in the study. The mean age was 4.3 and 6.3 years in groups 1 and 2, respectively. The mean follow-up period for Group 1 was 10.1 months (range 3–18 months), while in Group 2 it was 9.8 months (range 3–18 months). Two of the patients in Group 2 had cystitis-like symptoms, and no evidence of urinary tract infection was detected. Complaints were due to DJS irritation, and anticholinergic treatment was started. Both patients experienced regression of these complaints, and treatment continued until the stent was removed. None of the patients had postoperative pyelonephritis. Although the stents of patients in Group 1 were withdrawn early, no progress was observed in any of the patients' hydronephrosis, and no new hydronephrosis occurred. We observed regression in dilatation of all patients with hydronephrosis. Postoperative scintigraphic features of all patients were similar to those in the preoperative period. None of the patients required a second operation.

Discussion

Most surgeons perform stenting of the ureter in terms of anastomosis safety during intravesical UNC operations performed to treat vesicoureteral reflux or ureterovesical stenosis disease in pediatric patients. Removal of the ureteral stent requires anesthesia in pediatric patients. Every administration of anesthesia carries a natural risk. In addition, the patient must be hospitalized again, and therefore labor, time, and financial costs are incurred. To prevent the administration of anesthesia again within a short period, the patient waits 3–4 weeks for the second operation and lives with a stent during this time. Most clinics continue prophylactic antibiotic treatment during this time; however, in some patients, secondary to the foreign body reaction, urine burning, difficult urination, urinary tract infection, stent petrification—named "stent syndrome" [3]—can develop, which may require hospitalization [4,5]. Considerable research has been done on the treatment of stent-related symptoms in

adults. In treatment, anticholinergics or alpha blockers alone and their combinations have yielded successful results [6-8]. In children, although no specific study related to this syndrome has been reported, in one study patients were given combinations of painkillers, oxybutynin, and phenazopyridine for stent-related complaints after robotic pyeloplasty [9]. In addition, stent encrustation and stone formation are among the most difficult complications of DJS. These complications can be addressed with operations ranging from endoscopic minimally invasive methods to open surgery [10,11]. While some of these methods can be applied under local anesthesia in adults, all procedures are under general anesthesia in children. DJS migration is not common but is a well-known complication that extends the duration of the second session. Managing stent migration in pediatric patients is a more challenging process than in adults. Several methods for resolving this problem have been reported [12,13]. The most common, and most disturbing, complication is ureteral stent-dependent complaints. Modification of stent removal methods in pediatric patients is little studied, and related data about it are limited. Another preferred method is to place a thin feeding catheter to the anastomosed ureter. Then, the catheters are removed from lateral sides of the lower abdominal wall. However, in these patients, an additional surgical scar is formed after the catheter is removed. This scarring may cause cosmetic distress for patients, who are children. In addition, cases of infection can also be observed in this application because it involves exposure to the external environment. For all these reasons, we believe that the removal of the stent without anesthesia and before the discharge of the patient has numerous benefits and avoids the long-term use of antibiotics. There are few studies in the literature, and we could not find any stent removal method which can be performed easily and effortlessly [14].

This study has some limitations. Our sample was small since it was at a single center, and a single surgeon and the same surgical method were preferred. The other limitation was the retrospective design of the study.

In conclusion, since it is not possible to remove ureteral stents without anesthesia in childhood, the attachment of a DJS to the urethral catheter and removal with the catheter eliminates the need for any additional intervention or anesthesia. In this study, we did not observe any difference in terms of complications or surgical success in long-term observation of both methods. For these reasons, we consider that the removal of a stent placed during intravesical UNC operation without anesthesia and without cystoscopy is the less invasive method, with safety and long-term results comparable to the standard method.

Abbreviations:

Double-J stent: DJS

Ureteroneocystostomy: UNC

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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Figure 1: Intraoperative image of connecting the stent to the urethrally inserted catheter with a suture

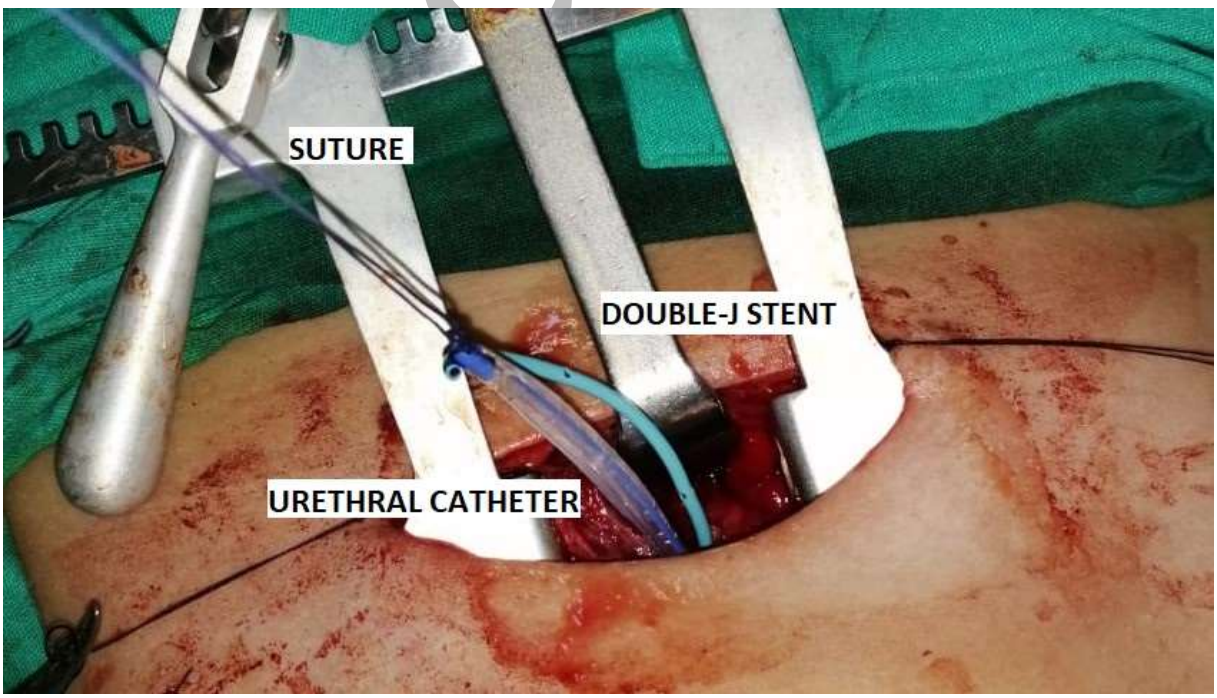

Figure 2: Intraoperative view of the ureteral stent attached to the catheter