Intraperitoneal laparoscopic Mitrofanoff procedure: Ureterocutaneostomy concomitant nephrectomy in a child with kidney transplantation: First case report

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Abstract

Introduction: Congenital alteration in the urinary tract represents 20 to 30% of pediatric patients with end-stage renal disease that required kidney transplantation. Poor bladder emptying and the pooling of mucus may result in an increased incidence of bladder stone formation and infectious that may produce reject and graft losing. In neuropathic bladder, various tubular structures have been proposed as alternative to drainage the urine. The mean important in this case is to report the outcome in the first intraperitoneal laparoscopic Mitrofanoff procedure using ureter concomitant a native nephrectomy in a child with kidney transplant in our center (Centro Médico Nacional Siglo XXI “Hospital de Pediatría Dr. Silvestre Frenk Freund” IMSS).

Case Report: An 11- year- old female child of 16 kg of weight and 1.3 m of size with kidney transplantation had 4 months’ history of recurrence urinary track infectious due to a neuropathic bladder and left native kidney hydrenphrotic. Intraperitoneal laparoscopic: ureterocutaneostomy concomitant left native nephrectomy was performed, like continence derivation in this child, to drainage the urine and prevented deterioration of graft function.

Conclusion: Laparoscopically, the ureter was used to create a continence conduit between bladder and skin without closing the bladder neck. The patient had a good outcome and we recommended a meticulous dissecting to the ureter-bladder union that should be used like a continence valve; at the same time, it is better placing a drainage for 1-2 days by an historical hydrenphrotic with kidney infectious.

Abbreviations: CIC*: Clean Intermittent Catheterization, IMSS*: Instituto Mexicano del Seguro Social

Introduction

Congenital alteration in the urinary tract represents 20 to 30% of pediatric patients with end-stage renal disease that required kidney transplantation [1,2]. Many patients in this group have neuropathic bladder or incontinent bladder, usually as consequence of spinal dysraphism. Poor bladder emptying and the pooling of mucus may result in an increased incidence of bladder stone formation and infectious that may produce reject and graft losing [1,3]. In neuropathic bladder, various tubular structures have been proposed as alternative to drainage the urine [4]. The Mitrofanoff principle has had a profound effect on incontinence surgery in children, his development of alternative continent bladder access through a continent stoma [1,4]. Others options to urinary continence through the bladder include the ureter, that has been used as an effective channel for catheterization by its mobility, however, it is certainly a more limited resource than small bowel, fallopian tube, bladder tubes and tabularized bowel [4,5].

The mean important in this case is to report the outcome in the first intraperitoneal laparoscopic Mitrofanoff procedure using ureter concomitant a native nephrectomy in a child with kidney transplant in our center (Centro Médico Nacional Siglo XXI “Hospital de Pediatría Dr. Silvestre Frenk Freund” IMSS).

Case report

An 11- year- old female child of 16 kg of weight and 1.3 m of size with kidney transplantation had 4 months’ history of recurrence urinary track infectious due to a neuropathic bladder and left native kidney hydrenphrotic. Intraperitoneal ureterocutaneostomy concomitant left native nephrectomy was performed, like continence derivation in this child, to drainage the urine and prevented deterioration of graft function (Figure 1 and Figure 2).

Surgical technique

Patient receive balanced general anesthesia and placed in a lateral decubitus position and the operating table slightly tilted to the reverse Trendelenburg position. By laparoscopic procedure with 4-trocar transperitoneal approach (Figure 3), a 10-mm laparoscopic optic trocar was placed below the umbilicus, two trocars of 5 mm were placed in the left abdominal side at the middle clavicular line upper and lower the level of the umbilicus, a fourth trocar was placed in the left midaxillary line upper the level of the umbilicus.

We began with a meticulous dissection by mobilizing the left colon up to the spleen flexure, the kidney was identified and by ultrasound dissector (harmonic), we dissected the ureter follow the bladder-ureter union and we perfected the nephrectomy by clipping kidney artery and vein. We performed, like continence derivation in this child, to drainage the urine and prevented deterioration of graft function.

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Key words: Intraperitoneal laparoscopic, Ureterocutaneostomy, Mitrofanoff procedure, kidney transplantation

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A 12 Fr umbilicus catheter was inserted by the ureter into the bladder like urinary drainage and ferulization for three weeks (Figure 4). The child was started on oral liquid feeds within 4 hours that had been suspended for an abdominal distended. The catheter was removed after ensuring that the patient and family could catheterize every 3 hours without difficulty previous a control cistograma (Figure 5 and Figure 6).

**Discussion**

The type of urinary diversion should be considered carefully, according to the condition of each individual [1,2,6,7]. Infectious disorder is an important risk factor that can result in failure of urinary diversion and kidney transplantation or reject [2,6,8,9]. Many authors mentioned, when transplant is performed, reconstruction renal function is optimized before undergoing the major procedure and its associated morbidity, the conduit for urinary tract reconstruction and/or augmentation before transplant may be unnecessary [2,3,8,10]. Underwent these observations, we performed the derivation after the transplantation in this patient and the aim of this case was to report on the indication, feasibility of intraperitoneal laparoscopic nephrectomy concomitant ureterocutaneostomy derivation and the satisfactory outcome.

Urological complication rates following renal transplantation can be as high as 20% to 45% in patient with a history of urinary tract infections; Bladder dysfunction in particular has been associated with higher rate of complications and renal graft failure [2,10,11]. The ureter of transplanted kidney needs to be anastomosed to a urine reservoir, with adequate compliance, capacity and efficient voluntary emptying [2,9]. In this child, we had observed a storage of urine bladder that manifested by recurrence infection of the urinary tract due to a High compliance bladder and a raised intravesical pressure that were considered the indications to create a continent conduit between bladder and skin [6,8,9,11]. The duration of operation was 146 minutes compared others studies that mentioned 111 minutes (range 85 to 175) for laparoscopic ureterocutaneostomy [5,12]. Small atrophic kidneys can be quickly removed with unilateral or bilateral lumbotomies, which are generally well tolerated. Laparoscopic and retroperitoneoscopic approaches to native nephrectomy have become relatively commonplace [11,13]. In our patient, we removed the native kidney by an intraperitoneal laparoscopic nephrectomy.

Kaefer and Retik reported an initial continence rate of 82% and ultimately 96%; Suze et al reported a 98% continence rate, our patient had continence after the procedure by the meticulous dissecting to
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had a good outcome without stomal leakage, necrosis or fibrosis of the ureter. The other patient who received nephrectomy had a totally functional ureterocutaneostomy 12 weeks after surgery. The blood loss was 50 cc versus 46 cc that mentioned the literature without nephrectomy, we had liquid diet in day two because he had abdominal distended due to peritoneal secretion, for that, we had placed a drainage in the site of the lower trocar for 3 days and we had a satisfactory outcome with a length stay of 6 days [5,12]. Concerning the time to performed the procedure many studies concluded that graft survival is not adversely affected compared to historical controls when a kidney transplantation is drained into a urinary conduit or augmented bladder [2,8,10]. Other study mentioned that kidney transplant recipients with prior bladder surgery have an increased risk of graft failure and an increased risk of infectious urinary complications. These risks should be considered in recipient selection and post-transplant management like we performed in our patient [7].

In children approaching adolescence and adulthood, the perceiving benefits of a minimally invasive approach such as lower-analgesic requirements improved recovery time and improved cosmesis might be more apparent than in younger children and the median length of stay was 7 days. In our patient, the blood loss was 50 cc versus 46 cc that mentioned the literature without nephrectomy, we had liquid diet in day two because he had abdominal distended due to peritoneal secretion, for that, we had placed a drainage in the site of the lower trocar for 3 days and we had a satisfactory outcome with a length stay of 6 days [5,12]. Concerning the time to performed the procedure many studies concluded that graft survival is not adversely affected compared to historical controls when a kidney transplantation is drained into a urinary conduit or augmented bladder [2,8,10]. Other study mentioned that kidney transplant recipients with prior bladder surgery have an increased risk of graft failure and an increased risk of infectious urinary complications. These risks should be considered in recipient selection and post-transplant management like we performed in our patient [7].

Conclusion

In this case, the technique had offered a tube of adequate lumen size and length, with easy catheterization a reliable blood supply and the versatility to be combined with a simultaneous, intraperitoneal native laparoscopic nephrectomy. The ureter was used to create a continent conduit between bladder and skin without closing the bladder neck. The patient had a good outcome and we recommended a meticulous dissection to the ureter-bladder union that should be used like a continence valve; at the same time, it is better placing a drainage for 1–2 days by an historical hydronephrotic with kidney infection.

Acknowledgements


Conflicts of interest

There are no conflicts of interest to disclose.

References

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