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CASE REPORT

First report of an unexpected blind-ending duplication of the ureter as a rare pitfall in kidney transplantation

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Summary

We report on the case of an unexpected blind-ending ureter in a kidney transplant. To our knowledge, this is the first report of a blind-ending ureter in kidney transplantation. The recipient was a 60-year-old woman, with a 6-year history of chronic haemodialysis. During the performance of ureterocystostomy, the ureteric stent could not be placed in the renal pelvis as the ureter, surprisingly, was found as blind-ending in the ureteral sheath. Dissecting the ureteral sheath a second shorter ureter was found and used for ureterocystostomy. The histology reported a normal ureter, which led to a thread of connective tissue. The patient had an uneventful recovery; the creatinine was 1.07 mg/dl at discharge from the hospital. It is mandatory for the transplanting surgeon to be aware of the ureteral variations and the surgeon should be trained in the surgical management of these variations. Accuracy should be ensured when exploring the exact anatomy of the donor organ.

Introduction

Anatomical variations of the ureter are common findings for urologists. Most of these variations are supposed to have no influence on the organ function. However, some of these variations do have crucial impact on renal function especially in kidney transplantation (e.g. ureter duplex with functionless upper pole of the kidney) or to the transplanting surgeon (e.g. missed second ureter during explantation of the kidney or during transplantation).

We report on the first case of a blind-ending ureter in a kidney-allograft.

Patient and donor

The organ recipient was a 60-year-old female with chronic renal failure caused by hypertensive nephropathy. The patient was treated by chronic haemodialysis for 6 years.

The kidney was explanted from a 53-year-old female donor. The explanting surgeon reported a single ureter, a single renal artery and two veins. During back-table preparation of allograft, two additional arteries, surprisingly, were found. The renal veins were sutured together side-to-side and anastomosed to the external iliac vein in end-to-side technique. Two arteries were left on an aortal patch. The third artery was implanted in an end-to-side-technique in the external iliac artery.

After completion of the vascular anastomosis, the ureter was prepared for anti-refluxive implantation. The ureter was incised distally, the bladder was filled with saline solution and the detrusor muscle was dissected to expose the bladder mucosa. The mucosa was incised and the ureter was sutured to the mucosa. After completing the lateral part of the anastomosis, a Double-J catheter was introduced to the ureter. The passage of the catheter stopped 4 cm before the renal pelvis. We examined the tissue of the ureteral-sheath, which is not affected normally during back-table preparation, in order to avoid damage of the vascular supply of the ureter. A blind-ending ureter was found in the ureteral sheath. During revision of the complete ureteral sheath, a second shorter, dissected ureter was found. Normal passage of the Double-J catheter in to the kidney pelvis was effected through this ureter. The anastomosis of the second ureter was performed and completed

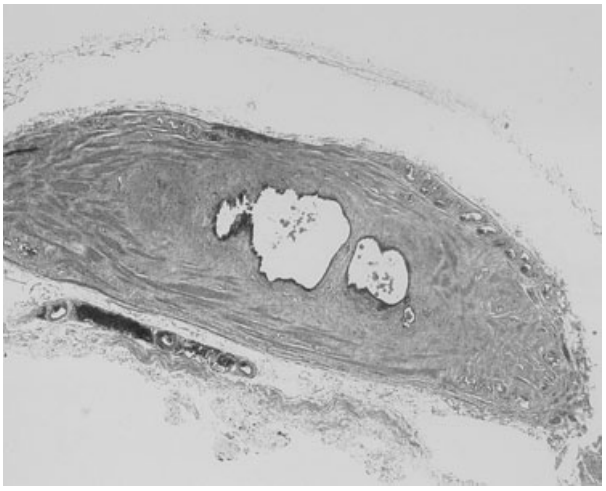

Figure 1 Histological specimen of the blind-ending ureter, normal pathological findings, the lumen is relatively small.

by suturing the bladder muscle. The blind-ending ureter was resected and sent for histology. The patient had an uneventful recovery; the Double-J catheter was removed after 14 days. The ultrasound showed a normal configuration of the kidney. The pathologist reported a normal ureter histology, which led to a thread of connective tissue (Fig. 1). The patient was discharged with a good transplant function; the creatinine was at this time 1.07 mg/dl.

Discussion

The ureteric bud as an epithelial protrusion of the Wolffian duct appears around the 28th day of development [1]. The arising ureteral bud reaches the metanephric mesenchyma and induces the development of the kidney. During this process, the lumen becomes atretic and is recanalized [1]. The embryogenesis of blind-ending ureters is the same as in ureteral duplications. In this case, the ureteral bud does not reach the metanephros and therefore the renal development for this bud is abortive. There are only a few reported blind-ending ureters reported in the literature, but none is reported in a donor kidney. Most frequently, they are reported as a ureter duplex with a blind-ending branch (Fig. 2). Reports of ureteral abnormalities in kidney transplantation are rare [2–4]. Most reported variation is ureteral duplication in the kidney transplant.

Keeping those variations in mind, accuracy in exploring the anatomy of the donor-kidney is mandatory for both the explanting and transplanting surgeons. The blind-ending ureter is the second rarest malformation and around 80 cases are reported in the literature. In kidney transplantation, it is important not to miss the regular ureter. Otherwise severe complications for urine flow like urinoma will occur, as in the case of a missed ureter duplex. In our case

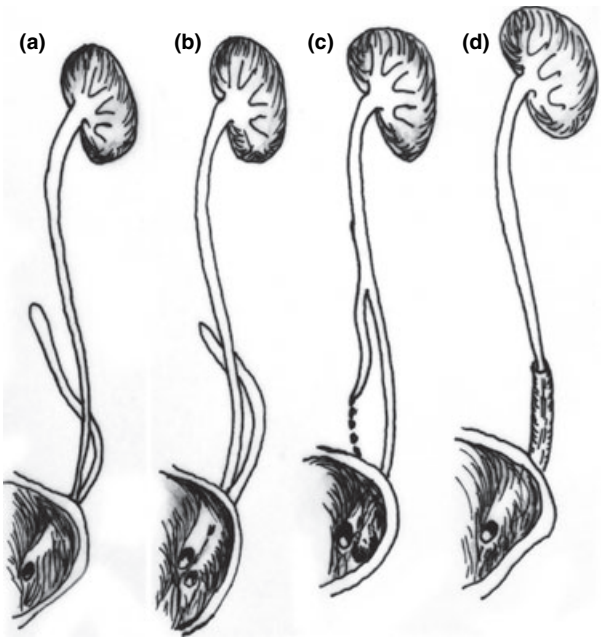

Figure 2 Different types of blind-ending ureteral duplications. (a) Blind-ending bifid ureter, (b) Blind-ending duplex ureter, (c) Inverted Y duplication with possible distal atresia, (d) Doubly blind-ending ureteral duplication surrounding a normal ureter.

only technical problems caused by the ureteric stent gave us the hint for recognizing the above ureteral abnormality.

Conclusion

We conclude that keeping embryological variations in mind is crucial for the explanting and transplanting surgeons.

Authorship

SH, GF, JE: drafting of the manuscript. SCM, HUK: critical review of the manuscript. TG: data acquisition. KB: preparing figures.

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