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Laparoscopic nephroureterectomy using the stoma site of cutaneous ureterostomy as a multi-channel port site in a 15-month-old child with megaureter: A case report

Michiko Nakamura, Kimihiko Moriya*, Masafumi Kon, Yoko Nishimura, Takeya Kitta, Nobuo Shinohara

Department of Renal and Genitourinary Surgery, Hokkaido University Graduate School of Medicine, Sapporo, Japan

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ABSTRACT

He was born with markedly dilated left megaureter. Since it disturbed his oral intake after birth, left temporary cutaneous ureterostomy was created at 3 days of age. Since his left kidney was dysplastic, laparoscopic left nephroureterectomy was performed using the stoma site of cutaneous ureterostomy as a multi-channel port site at 15 months of age. He had no complications after surgery, and the postoperative wound appearance was good.

This is the first report of the stoma site being used as a multi-channel port site in the urology field. This surgical approach provides good cosmetic outcomes.

Introduction

Laparoscopic surgeries have become standard procedures in the field of pediatric urology. The application of laparoscopic single-site or reduced port surgery has been also expanded to the pediatric urology field[1–3] as an advanced surgical procedure. Although these approaches are technically demanding compared with conventional laparoscopic surgery, they provide better cosmetic results. In single-site and reduced port laparoscopic surgeries the main surgical port is usually placed in the umbilicus for cosmetic reasons. In this report, we present laparoscopic nephroureterectomy using the stoma site of cutaneous ureterostomy for a multi-channel port site in a child with left megaureter.

Case presentation

At 39 weeks of gestation, a 2930-g boy was born by vaginal delivery with prenatally detected bilateral hydronephrosis and left megaureter. On the next day after birth, he developed vomiting due to a markedly dilated left ureter, which extended to the right side over the midline (Fig. 1). As placement of a urethral catheter did not improve his condition, cutaneous ureterostomy was placed at the left lower quadrant on the 3rd day after birth. His general condition quickly recovered after surgery.

MRI and Technetium-99 m mercaptoacetyltriglycine (MAG3) scintigraphy at 10 months of age revealed that his left kidney was dysplastic and the split renal function was less than 2%. Thus, left nephroureterectomy was indicated for the management of left megaureter. Since he had left intra-abdominal testis detected on ultrasonography, left orchiopexy was also planned.

At 15 months of age, laparoscopic left nephroureterectomy using the stoma site of cutaneous ureterostomy for a multi-channel port site and left orchiopexy were performed simultaneously. Under general anesthesia, the patient was placed in a semi-lateral decubitus position. The skin was incised approximately 2.5 cm along the stoma site of cutaneous ureterostomy (Fig. 2-A) and the left ureter was dissected from the stoma site as far as possible under direct visualization. In the end of the lower side of the ureter, the ureterovesical junction was identified and closed. Then, Lapprotector minimini® was placed on the stoma site and EZ Access® (Hakko, Tokyo, Japan), which was used as a multi-channel access platform for laparoscopic surgery (Fig. 2-B), was attached on top. The ureter to the affected kidney was peeling off from the surrounding tissue after adding another 5-mm port lateral to the stoma site. As the blood vessels of the dysplastic left kidney were thin, they were sealed and cut using Ligasure® (Fig. 2-C). The left kidney was removed from the stoma site leaving the adrenal gland behind. Since the left testis was identified just under the stoma site, it was fixed into a

*Abbreviations:*MAG3, Technetium-99 m mercaptoacetyltriglycine

* Corresponding author. Department of Renal and Genitourinary Surgery, Hokkaido University Graduate School of Medicine, North-15, West-7, Kita-Ku, Sapporo, 060-8638, Japan.

E-mail address: k-moriya@med.hokudai.ac.jp (K. Moriya).

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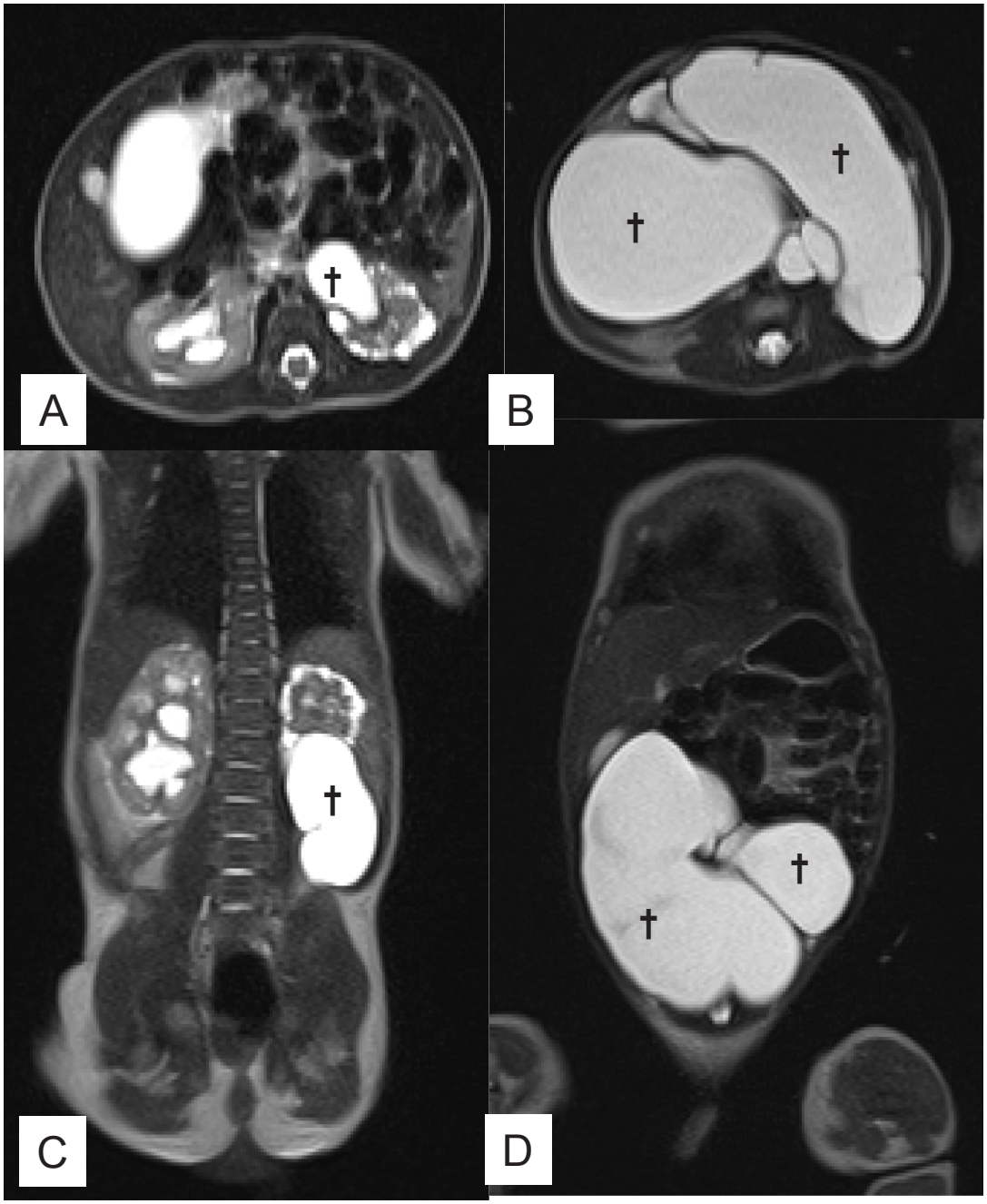

Fig. 1. MRI on the 1st day after birth.
MRI revealed left multiple renal cysts and a markedly dilated left ureter (†), which extended to the right side over the midline. A (axial view) and C (coronal view) were at the kidney level, and B (axial view) and D (coronal view) were at the lower abdominal level.

dartos pouch in the scrotum using Prentiss maneuver under direct visualization. The surgical time was 308 minutes, and the amount of blood lost was approximately 10 ml. A drainage tube was not placed.

The patient had no complications after surgery, and was discharged 4 days after the operation. The postoperative wound appearance was good and his left testis was in the scrotum (Fig. 3).

Discussion and conclusions

Antenatally diagnosed megaureter often resolves spontaneously. However, intervention is sometimes required when it becomes symptomatic. Although megaureter is generally managed by ureteric reimplantation, nephroureterectomy is considered if the affected kidney is non-functioning or dysplastic. Moreover, for newborns or small infants with symptomatic upper urinary dilation, cutaneous ureterostomy is an option as a temporary urinary diversion before definitive management. In the present case, as the patient was not capable of oral ingestion due to a markedly dilated ureter, cutaneous ureterostomy early after birth was indicated. We also decided to remove the left kidney because no functional improvement was observed.

Nephroureterectomy, especially for benign disease, is performed laparoscopically even in children. Laparoscopic single-site or reduced pot surgery can be broadly applied across many extirpative and reconstructive procedures in children.[1–4] These procedures provide better cosmetic outcomes and pain relief.[3,4]

The umbilicus is the major site of access due to improve esthetic outcomes. Yamada et al. demonstrated that the operation time was not significantly different between conventional laparoscopic surgery and

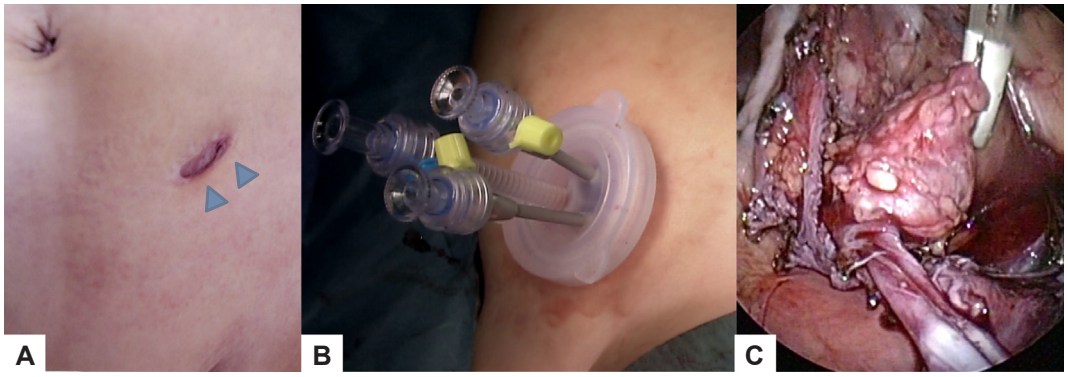

Fig. 2. Multi-channel port using the cutaneous ureterostomy site
A. Left cutaneous ureterostomy (arrow head) before laparoscopic surgery.B. Lapprotector minimini® and wear EZ Access® (Hakko, Tokyo, Japan), which used a multi-channel access platform, were set on the stoma site.
C. Laparoscopic view during operation. As the left kidney was dysplastic, the renal vessels were dissected using Ligasure®.

Fig. 3. Wound appearance at 1 year and 9 months after surgery (arrow head). *; umbilicus.

single-site pyeloplasty, but the pain subsided more quickly after single-site surgery.[2] They also noted that because surgery scars are expected to expand with growth in pediatric patients, single-site surgery using the umbilicus results in a significant difference in the cosmetic outcome compared with conventional laparoscopic surgery in the long term.

In the present case, the stoma site was used as the main site of access as an alternative to the umbilicus. In colorectal surgery, reduced port laparoscopic abdominoperineal resection using the intended stoma site has also been reported.[5] They use the intended colostomy site and umbilicus as the port site, and they reported that this procedure was safe and feasible for selected patients. However, we found no report in which the stoma site was used as the port site from the urology field. We consider the umbilicus to be the most common site of access from a cosmetic point of view. In our case, as the ureterostomy was previously created, it was used as the stoma site for a multi-channel port. As single-site or reduced port surgery is a more complex and difficult procedure compared with conventional laparoscopic surgery, the reconstructive procedures are more challenging. Accordingly, resection of a nonfunctional small kidney is appropriate for this procedure. Since the renal vessels are not thick in such kidneys, the vessel sealing system is useful for cutting these vessels. Moreover, an additional port improves this procedure. As the kidneys in older children are further from the stoma site than those in younger ones, this procedure may be good for younger children.

Definitive surgery for upper urinary tract dilation after creation of the cutaneous ureterostomy is usually indicated; therefore, multi-channel platform through the stoma site may be a useful option for such patients. Moreover, we consider this surgical approach to provide good cosmetic results.

Statement of ethics

Written informed consent was obtained from the patient's legal guardian for publication of this case report and any accompanying images.

Disclosure statement

The authors have no conflicts of interest to declare.

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