Anastomotic leakage treatment with endoscopic stent after small bowel transplantation in an infant

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QUESTION

An isolated small intestine graft taken from an adult cadaver was transplanted into a 14-month-old patient, weighing 7.5 kg, who had short bowel syndrome that had occurred after a midgut volvulus. The passage of the gastrointestinal system was achieved with side-to-side duodenoenterostomy between the native duodenum and the graft. Enteral feeding was started at the postoperative week 1. Abdominal distension, fever, and sepsis-like clinic picture were observed on the 15th postoperative day. Abdominal ultrasonography was undertaken, revealing fluid collection at the abdomen, and after a contrast study was conducted, a leakage was detected at the duodenoenterostomy site (Figure 1). Enteral feeding was stopped. A percutaneous drainage catheter was placed under ultrasonographic guidance and revealed that this fluid was compatible with the contents of the intestine.

Figure 1. Contrast x-ray graphy to detect leakage.

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What do you prefer for treatment in this case: endoscopic or surgical management?

ANSWER

The leakage area was examined under endoscopic evaluation (Figure 2). The endoscopic hemoclips were then applied, and a fully covered Niti-S pyloric/duodenal stent (Taewong Medical, Seoul, Korea) (length: 12 cm; diameter: 20 mm) (Figure 3) was inserted at the patient's bedside, to pass through this area endoscopically (Figures 4 and 5). After the procedure, a tube was placed to provide gastrojejunal nutrition through gastrostomy to the distal region of the anastomosis. No signs of rejection were observed by histopathological examination of biopsies of the grafts on follow-up. The leakage drainage from the percutaneous catheter in the abdomen was found to have decreased at the 25th day after endoscopic treatment. However, minimal leakage drainage was detected by contrast radiography, and we decided to undertake a mini laparotomy. The stent was removed at time of surgical repair. The leakage site was found to have healed one week after this procedure by assessment of contrast graphy, and no recurrence was observed at the follow-up.

Figure 2. Endoscopic image from leakage area measuring about 10 mm in diameter.

MAIN POINTS

- *The stenting is an endoscopic therapy that is an alternative treatment for fistulae and anastomotic leaks in patients who are not suitable for the surgery.*
- *The advantage of the stenting is that allows for bedside intervention.*
- *Endoscopic stenting may be used as a bridge therapy before surgery in small children.*

Figure 3. Suture performed on both heads of the stent to attach and remove the endoscope.

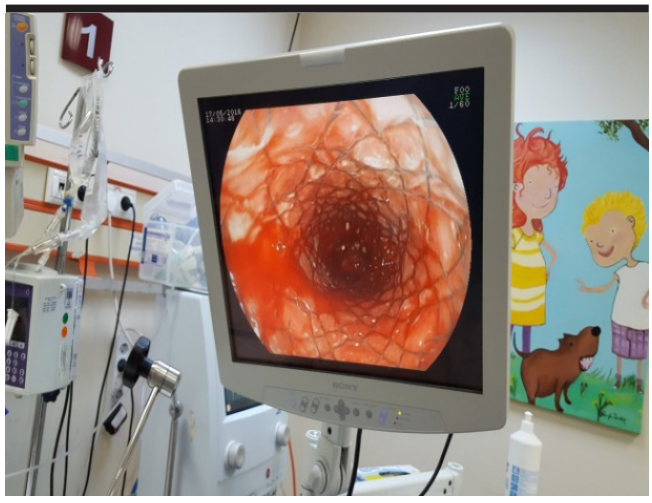

Figure 4. The stent was inserted into the leakage area endoscopically at the bedside.

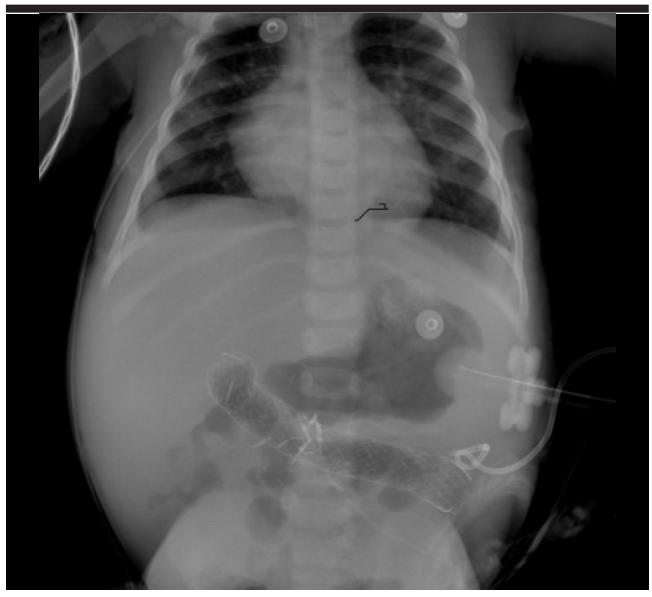

Figure 5. Image of the stent on x-ray graphy after placement.

DISCUSSION

The most effective treatment for gastrointestinal leaks remains controversial (1). Anastomotic complications after intestinal transplant surgery include leaks, fistulae, and late strictures (2). Anastomosis leakages most often require surgery, but this may not always be possible or successful because of both technical failures and patient factors. As in our case, early surgery may not be suitable for the patients because of hemodynamic instability, immunocompromised status, and local fragility of the tissues due to bile acid exposure in the leakage region of the bowel. In this situation, morbidity may increase in cases where there is an unsuccessful surgical intervention. Therefore, endoscopic intervention offers a minimally invasive alternative modality at the bedside for the treatment of anastomosis leakage. In addition, the use of a stent in treating anastomotic leaks is also associated with decreased lengths of hospital stays as well as earlier initiation of enteral feeding (3). If surgery is not suitable for the patient, endoscopic therapies such as stenting, clipping, full-thickness suturing, and the use of tissue adhesives are alternatives for treatment of fistulae and anastomotic leaks (1). However, the location of the defect is also important. For example, using stents to close defects in the medial duodenal wall may be challenging because of the risk of obstruction of the ampulla of Vater especially small pediatric cases (1), and these may also cause sphincter of Oddi dysfunction and cholestasis. But cholestasis was not observed in our case.

Another problem is that no commercial stents are available for children as they are for adults. Therefore, technical difficulties are observed in small children, especially in relation to the stent diameters, because many stent guide diameters are larger than the working channel diameters of the scopes used in the children. In our case, we placed the stent over the scope like a sheath.

In the literature, four adult patients were diagnosed with enteric leaks and required re-exploration after intestinal transplantation (2). These patients were treated with revision of anastomosis, and two patients required ileostomy. Of the 49 cases of intestinal transplantation documented by Gupte et al (4), one case had an anastomotic leak, and this was treated by refashioning the anastomosis. The surgery was not suitable for our patient because of his hemodynamic instability and sepsis-like condition. Therefore, a stent was inserted into the leak site and a hemoclip placed by endoscopy to reduce the massive flow of bile into the abdomen and save time for surgery. After the procedure that we undertook had been completed, enteral nutrition was provided by a gastrojejunal tube.

Chang et al reported in their article that 29.8% of cases required surgical intervention because of persistent symptomatology after endoscopic stent therapy for anastomotic complications in adult cases with bariatric surgery (3). In our case, the stenting and clipping improved clinical findings because of decreased anastomotic leakage, but we did not observe full recovery in the leakage area. The most common complication of endoscopic stents is migration. A stent with endoscopic suture fixation and/or an endoclip fixation of the stent can be used to prevent migration. We did not use the endoclip fixation technique. Because there was a large leakage area, clinical outcomes for endoclip closure of gastrointestinal fistulae and leaks have been studied in multiple retrospective studies with a success rate of 75%-89% for the closure of fistulae and leaks (5). However, the effectiveness of using a clip is also limited by the size of the defect.

In conclusion, endoscopic stenting and clipping may be used as a bridge therapy before surgery in small children when it is not suitable for them to have immediate surgery. A further advantage of the endoscopic procedure is that it allows for bedside intervention.

Informed Consent: Written informed concent was obtained from parents of patient who participated in this study.

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