Case Report

Intragastric Cystogastrostomy in a 4-Year-Old Child with a Pancreatic Pseudocyst: A Novel Technique

Akinori Sekioka, Toshiaki Takahashi[1], Koji Fukumoto[1], Naoto Urushihara[1]

Department of Pediatric Surgery, Shizuoka Children's Hospital, Shizuoka, Shizuoka Prefecture, [1]Department of Pediatric Surgery, Shizuoka Children's Hospital, Aoi-ku, Shizuoka, Japan

Abstract

Pancreatic pseudocysts (PPs) often occur in association with acute pancreatitis or pancreatic trauma and are uncommon disorders in children. PPs require operative interventions in case they do not disappear spontaneously. There are several interventional treatments, and laparoscopic or endoscopic treatments have been recently reported as a less invasive procedure. However, these procedures are sometimes difficult to perform for small children. We describe a novel intragastric cystogastrostomy with mini-laparotomy for a 4-year-old female child. She presented with a PP caused by trauma. The PP failed to resolve after 6 weeks and we performed open cystogastrostomy. We made mini-laparotomy and inserted a wound retractor into the stomach and expanded both the abdominal and the gastric walls. This procedure created a good operative field and enabled intragastric cystogastrostomy even in small children. There were no complications. At 10-month postsurgery, a follow-up computed tomography showed no recurrence of PP. This novel intragastric cystogastrostomy for PP, which includes the insertion of a wound retractor, is a safe, minimally invasive, and technically feasible approach for younger children with PP. To the best of our knowledge, this is the first report to describe the intragastric cystogastrostomy with a wound retractor.

Keywords: Children, intragastric surgery, open cystogastrostomy, pancreatic pseudocyst, wound retractor

Introduction

Pancreatic pseudocysts (PPs) are rare in children and usually result from acute pancreatitis or pancreatic duct damage caused by abdominal trauma. PPs can cause pain, obstructive symptoms such as nausea or vomiting, hemorrhage, and infection. PPs disappear spontaneously in most pediatric cases. Therefore, nonoperative management is often chosen initially.[1,2] PPs that fail to resolve after approximately 6 weeks of nonoperative management require additional intervention.

Several interventional treatments are used, including endoscopic approach, percutaneous drainage, and surgery (open or laparoscopic).[2] Open cystogastrostomy has long been a standard procedure in the operative management of PPs. Laparoscopic and endoscopic procedures were recently reported to cause less postoperative pain. However, these studies evaluated primarily adults patients and included few patients younger than 6 years.[3-6]

We describe a novel open cystogastrostomy procedure, in which a wound retractor (Smart Retractor®, TOP Corporation, Japan) was inserted into the stomach of a 4-year-old child with PP.

Case Report

A 4-year-old female child was admitted to our hospital with sustained fever, vomiting, and abdominal pain. She was 97 cm tall (−1.1 standard deviations) and weighed 13.3 kg (−1.2 standard deviations). Although there was no apparent history of trauma, abuse was suspected. Computed tomography revealed pancreatic damage and extensive fluid collection around her pancreas, and percutaneous drainage was performed on days 2 and 12. On day 8, endoscopic retrograde

Address for correspondence: Dr. Akinori Sekioka, Department of Pediatric Surgery, Shizuoka Children's Hospital, 860 Urushiyama, Aoi-ku, Shizuoka, Shizuoka Prefecture 420-8660, Japan.
E-mail: akinori-sekioka@i.shizuoka-pho.jp

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cholangiopancreatography was performed, and pancreatic duct transection was diagnosed. Although the patient's symptoms were controlled after the drainage, a PP in the middle of pancreas gradually enlarged [Figure 1]. Because the PP did not resolve after 6 weeks, internal drainage via cystogastrostomy was planned.

Surgical procedure

The patient was placed on her back and the location of PP was marked on the abdomen and confirmed with ultrasound. We then made a 4-cm transverse incision at the left upper quadrant of the abdomen. After laparotomy, an incision of approximately 4 cm was made on the anterior wall of the lesser corpus of the stomach, and the gastric wall was sutured to the abdominal wall at four points. Then, we inserted an S-size (2.5–6 cm) wound retractor into the stomach and expanded both the abdominal and the gastric walls [Figure 2]. The PP was palpable on the posterior wall of the stomach.

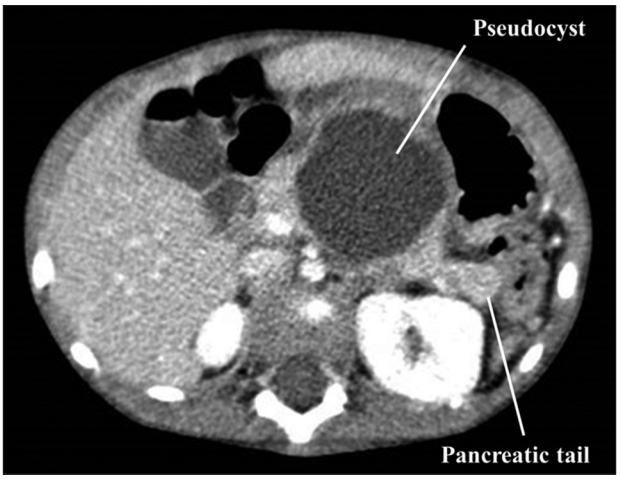

Figure 1: This abdominal computed tomography axial section showing a pancreatic pseudocyst measuring 6 cm × 6 cm at the body of the pancreas

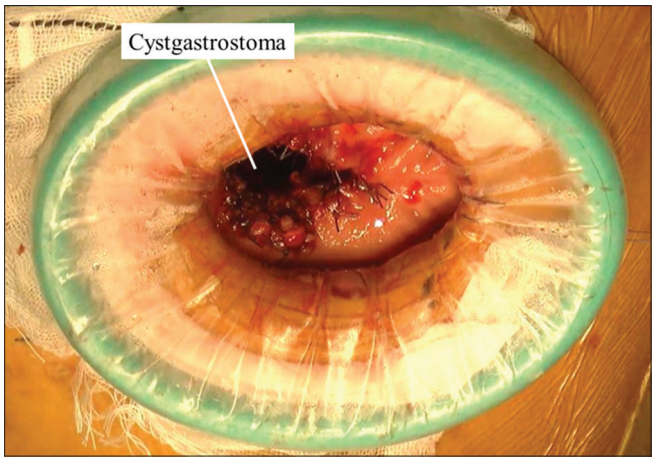

Figure 3: Wound retractor expands both the abdominal wall and anterior wall of the stomach, exposing the cystogastrostoma

After puncturing the PP with a 22-G needle through the posterior gastric wall to confirm its location, we incised the PP via electric scalpel. Both the gastric and the PP walls were thickened and adhered to each other. A 3-0 interrupted suture (Coated VICRYL®, Ethicon) was inserted in both walls, and the diameter of the internal drainage hole was approximately 3 cm [Figure 3]. The anterior gastrotomy was closed with 3-0 vicryl sutures. The total operative time was 122 min.

Postoperative course

The postoperative course was uneventful. An upper gastrointestinal series on the postoperative day (POD) 6 confirmed that the cyst was shrinking and detected no anastomotic leakage [Figure 4]. The patient began oral intake and resumed eating a normal diet on POD 15. She was discharged home on POD 18 without complications. At

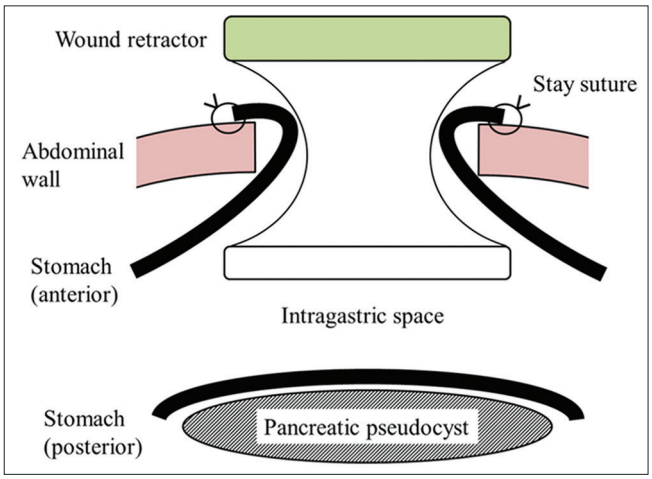

Figure 2: This illustration shows the approach, inserting wound retractor into the stomach

Figure 4: Upper gastrointestinal series on the postoperative day 6 showing the cavity of the pancreatic pseudocyst. The size of the pseudocyst has got smaller

10-month postsurgery, a follow-up computed tomography (CT) showed no recurrence of the PP.

Discussion

Various surgical interventions, including an endoscopic approach (transpapillary or transmural drainage), percutaneous drainage, and cystogastrostomy (open or laparoscopic), are implemented for PPs. Each approach has disadvantages and limitations; therefore, consensus is lacking for which the procedure is best.[2]

Open cystogastrostomy has long been the standard for the internal drainage of PPs.[6] Although postoperative complication rates are estimated to be only approximately 10%, which is not high compared with the complication rates of other approaches,[2,6] the open procedure can leave a large scar and is accompanied by severe postoperative pain.

The endoscopic approach is less invasive, and some reports showed that it is efficacious even in children aged 2–3 years.[3] However, this approach is not technically easy to perform and can be undertaken only by expert endoscopic surgeons. Moreover, the drainage site in this approach is relatively small, which presents the risk of drainage site occlusion and PP recurrence.[2,4]

Laparoscopic cystogastrostomy is known as a feasible approach.[4,5] However, similar to the endoscopic approach, this procedure is technically challenging in smaller children. Moreover, laparoscopic cystogastrostomy often requires the use of additional devices (trocars, vessel sealing instruments, or endostaples) and therefore costs more than other procedures.

Son *et al*.[7] and Tudor and Clark[8] have reported an intragastric procedure that involves inserting a wound retractor into the stomach for the retrieval of large trichobezoars in adults and children. The reported advantages of this procedure are safety, shortened operative time, and protection of both the wound edges and the peritoneal cavity. Therefore, we applied this technique to an open cystogastrostomy procedure for PPs.

In our procedure, the internal drainage site was fashioned with absorbable sutures. Endostaples, which remain in the stomach, have also been used in laparoscopic cystogastrostomy. Recently, some reports showed that residual staples or suture materials can cause a foreign body reaction, ulcer, bleeding, or granulation of the gastric wall.[9,10] Those complications might be rare, but they are important to avoid, and our procedure does so. Furthermore, we suggest that our procedure with absorbable sutures is safer than the laparoscopic approach using endostaples.

This report is the first to describe the technique of a pediatric pancreatic cystogastrostomy. Compared with conventional open cystogastrostomy, our procedure results in less scaring. Our procedure also costs less than other approaches. Moreover, the insertion of a wound retractor in this procedure creates a good operative field even in younger children with small intraperitoneal cavities as was present in our patient. Further studies of this procedure with longer follow-up are warranted.

Conclusions

Our novel intragastric cystogastrostomy for PP, which includes the insertion of a wound retractor, is a safe, minimally invasive, and technically feasible approach for younger children with PP.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Confiicts of interest

There are no conflicts of interest.

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