

Pseudocyst of the Pancreas on Pancreas Divisum in Children: Case Report

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ABSTRACT

Introduction: pancreatic pseudocysts (PKP) are rare with various causes. Management is non-consensual but consists of either cystic shunt or cystic excision. In accordance with the SCARE criteria, we report here the case of a 6-year-old child who presented with PKP due to acute pancreatitis and was managed by cysto-gastrostomy with simple follow-up. **Clinical case:** A 6-year-old girl was seen for periumbilical pain radiating to the spine and hypochondria and evolving for 3 weeks. The pain was of moderate intensity and had no sedative or triggering factors. It appeared in a non-traumatic context and apyrexia. On examination, the abdomen was distended with palpatory pain and a renal, matt mass occupying the periumbilical region, the left hypochondrium and the left flank. Ultrasound and abdominal CT scan showed a heterogeneous mass of the head of the pancreas with dilatation of the duct of Wirsung. The amylase was 521 IU/L and the lipase was 309 IU/L. The diagnosis of pseudocyst of the pancreas on acute pancreatitis was retained. She underwent trans-gastric cystic marsupialization with cysto-gastric bypass. The postoperative course was simple with a total regression of pain and a progressive weight regain. **Conclusion:** Acute pancreatitis is a frequent etiology of PKP that should be treated appropriately to avoid its occurrence.

Keywords: pseudocyst, acute pancreatitis, cysto-gastrostomy

INTRODUCTION

Pancreatic pseudocysts are collections of fluid in the pancreatic tissue or adjacent pancreatic space. It is a fluid-filled sac formed in the abdomen containing pancreatic enzymes and necrotic tissue surrounded by a non-epithelialised wall of fibrous tissue [1, 2]. The incidence is 1.6 to 4.5 per 100,000 adults each year, with a prevalence of 10 to 20% in acute pancreatitis and 20 to 40% in chronic pancreatitis [3, 4, 5]. In children, the incidence is rarer and the main cause is abdominal trauma. In 25% of cases, the aetiology remains unknown [5]. Clinical presentation includes nausea, vomiting and abdominal pain. Patients may be asymptomatic or in severe distress due to serious complications. The clinical variability of this condition and its non-specific clinical signs have made diagnosis difficult in the past. Current advances in medical imaging, with the advent of ultrasonography, computed tomography and bilio-pancreatic MRI, mean that diagnosis is now easy and early. Management depends on the location and presentation of the pseudocyst. It is complex, and discussions differ between authors as to the ideal time for surgery after discovery of the pseudocyst, and the type of procedure to be used for the best result [6]. In accordance with the SCARE criteria [7], we report here the case of a 6-year-old child who presented with a PKP following acute pancreatitis and treated by cysto-gastrostomy with simple sequelae.

CASE STUDIES

A 6-year-old girl was admitted with abdominal pain 3 weeks prior to admission. The pain was periumbilical, radiating to the spine and hypochondria. There was no evidence of trauma, fever or transit disorders. Traditional treatment (based on herbal tea and application of ointments to the abdomen) was instituted without success. The course was marked by persistent pain, with the onset of abdominal distension, weight loss (not quantified) and anorexia. On admission, the child was found to be in poor general condition, with pale palpebral mucosa and no mucocutaneous icterus. She weighed 14 kg, was afebrile, eupneic and normocardiac. The abdomen was distended with diffuse pain on palpation, predominantly

in the periumbilical region. There was a mass in the hypochondrium and left flank, extending to the periumbilical region, renitating and dull on percussion.

On imaging, abdominal ultrasound revealed a bulky, septated fluid mass in the left flank. The liver, kidneys and spleen were normal. Abdominal computed tomography for further characterisation revealed a pancreas of normal morphology with a dorsal pancreatic duct within normal limits (Figure 1), an oblong hypodense formation of the pancreatic uncus measuring 28 mm x 18 mm (Figure 2A), communicating with the dorsal pancreatic duct (Figure 2B) with a separate outlet into the duodenum, suggestive of a dilated ventral pancreatic duct on a pancreas divisum ; an abdominopelvic mass consisting of a homogeneous, hypodense, encapsulated collection with thin, raised walls measuring 138 mm x 102 mm, well confined in front of the pancreas and pushing the stomach and other neighbouring organs forward, in association with a pseudocyst of the pancreas (Figure 3). There was a copious free intraperitoneal fluid effusion.



Figure 1: axial section abdominal CT scan with injection showing dorsal pancreatic duct

The biology revealed anaemia of 9.9 g/dl, hyperleukocytosis of 14700 elements/mm³ (PNN = 49%), CRP < 6 mg/l, amylasemia = 521 IU/L and lipasemia = 309 IU/L.

The diagnosis of pseudocyst of the pancreas in the setting of acute pancreatitis caused by a probable incomplete pancreas divisum was accepted.

The patient was put on digestive rest, treated for pain, hydrated with serum glucose and electrolytes, and given amino acids. Given the size and location of the cyst, we opted for a cystodigestive bypass. Three weeks after admission (six weeks after the onset of symptoms), a trans-gastric cystic marsupialization with cysto-gastric bypass was performed by left transverse laparotomy (Figure 4). A gastric tube was left in place for 5 days.

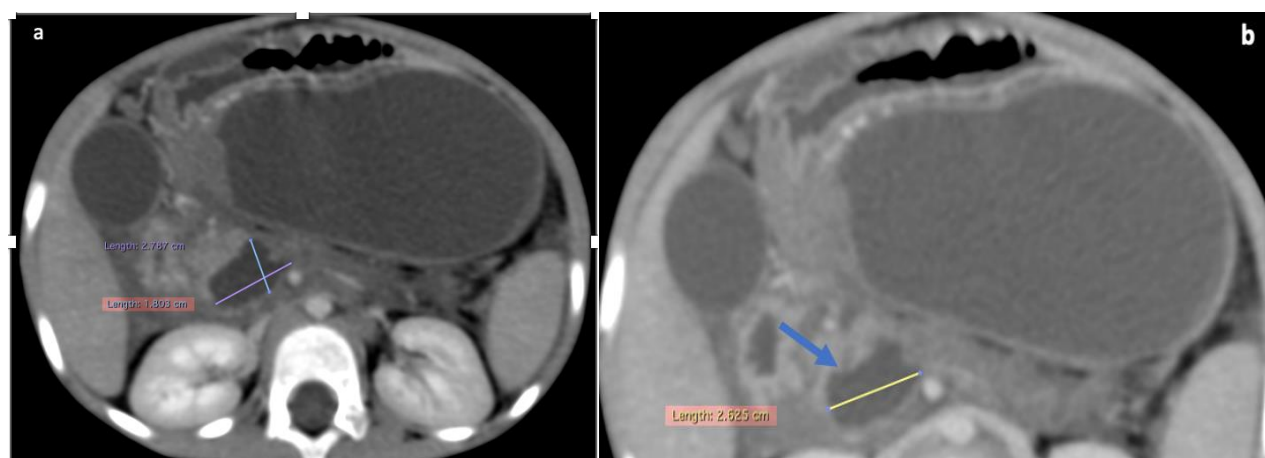


Figure 2: axial section abdominal CT scan with injection showing the dilated ventral pancreatic duct (a) communicating with the dorsal duct (blue arrow) (b)

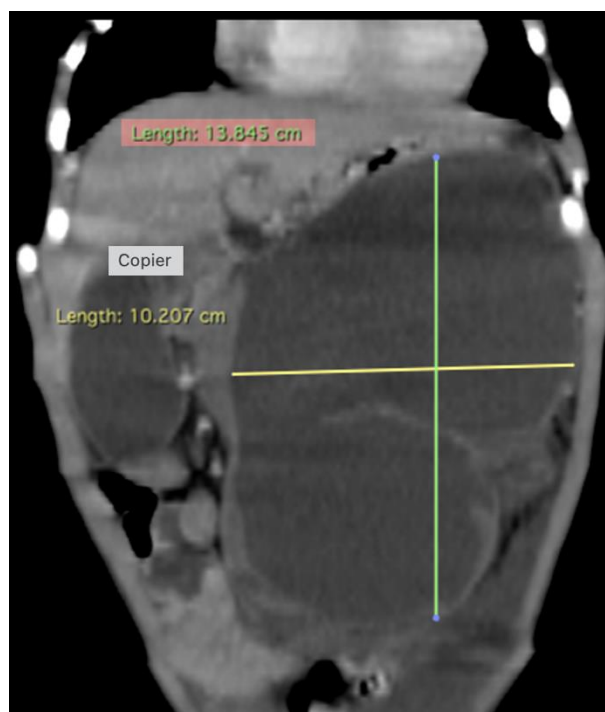


Figure 3: frontal reconstruction abdominal CT scan showing pseudocyst

The post-operative course was favourable. The child received antibiotic therapy consisting of ceftriaxone (50 mg/kg/day) and metronidazole (30 mg/kg/day) for 10 days, hydration and amino acids. The gastric tube was removed on the 5th day and oral feeding gradually resumed. The post-operative course was straightforward, with total regression of pain and weight gain, enabling the patient to be discharged from hospital on the 15th post-operative day.

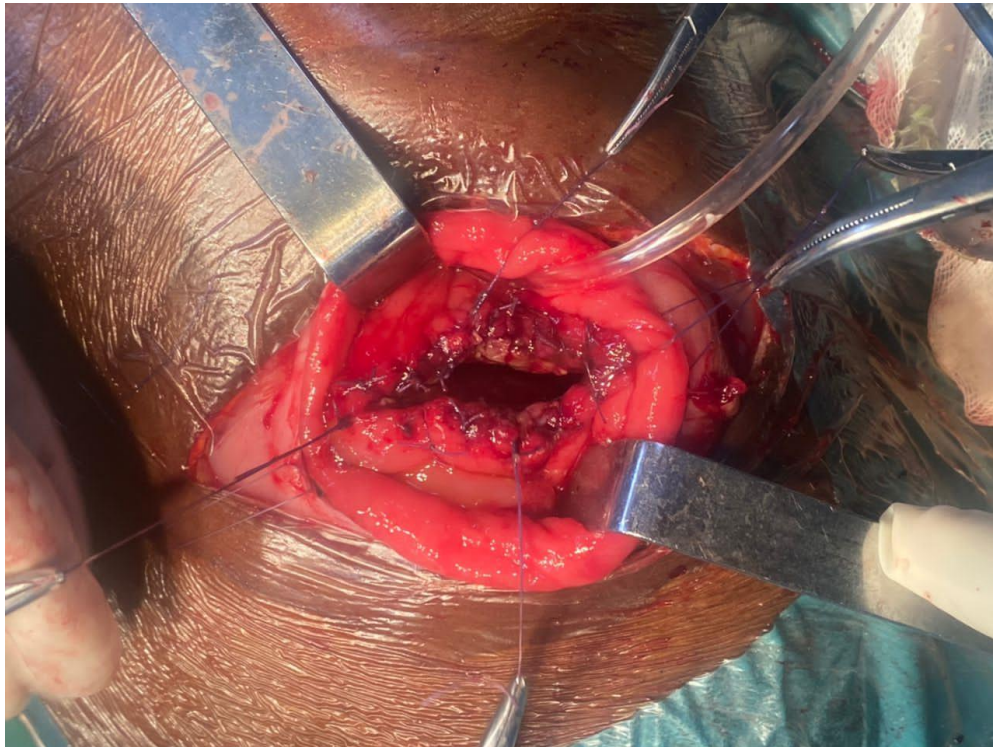


Figure 4: transgastric cystic marsupialization with cysto-gastric anastomosis

DISCUSSION

Pseudocysts of the pancreas are rare lesions in children. They are collections of fluid located in the pancreatic tissue or adjacent pancreatic space. They are surrounded by a non-epithelialised wall of fibrous tissue and contain virtually no solid material [2]. Most pancreatic pseudocysts arise following disruption of the pancreatic ductal system due to pancreatitis or any trauma resulting in accumulation of fluid and enzymes [2, 3].

The clinical presentation of patients with pancreatic pseudocysts varies. Children may be asymptomatic or in severe distress with a major abdominal emergency due to complications [3, 5]. There are no specific symptoms for pseudocysts. However, the most common signs are abdominal pain (76-94%), nausea and vomiting (50%) and weight loss (20-51%). Occasionally, patients present with jaundice, fever and pleural effusion or even septicaemia due to complications [3].

From an aetiological point of view, pancreatic pseudocyst is a rare complication of acute or chronic pancreatitis in children, occurring in around 10-23% of cases. The other predominant causes are abdominal trauma (23%), including maltreatment syndrome [1], anomalies of the pancreaticobiliary system (15%) (congenital anomalies of the pancreaticobiliary junction, pancreatic divisum, choledochal cysts or choledocholithiasis), multisystem diseases (14%), drugs and toxins (12%), viral infections (10%), hereditary diseases (2%) and metabolic disorders (2%). In up to 25% of cases, the aetiology of childhood pancreatitis is unknown [5, 8].

There are several classification systems for pseudocysts, including that of D'Egidio and Schein in 1991, in which pseudocysts were classified according to the underlying aetiology of acute or

chronic pancreatitis, the anatomy of the pancreatic duct and the presence of communication between the cyst and the pancreatic duct. Using this classification system, the cyst can be divided into three distinct types. In 2002, Nealon and Walser [9] proposed a simpler classification based on pancreatic duct anatomy from endoscopic retrograde cholangiopancreatography (ERCP).

A- Acute pancreatitis		
Type	Description	Illustration
I	Normal duct/no communication	
II	Normal duct with communication	
III	Normal duct with narrowing/no communication	
IV	Normal duct with narrowing/with communication	
V	Abnormal duct/complete obstruction	
B- Chronic pancreatitis		
VI	Normal duct/no communication	
VII	Normal duct/with communication	

In 2015, using a large retrospective study of 893 patients with pancreatic pseudocysts, Pan et al proposed a new classification based on the anatomical location and clinical manifestation of the pseudocysts, as well as the relationship between the cyst and the pancreatic duct [2]. This classification, which is the most widely used, is as follows:

I		Pseudocyst < 5 cm without symptoms, complications or neoplasia
II		Suspected cystic neoplasia
III		Pseudocyst located in uncinate pancreatic process
	IIIa	Communication with pancreatic duct (+)
	IIIb	Communication with pancreatic duct (-)

IV		Pseudocyst located in the head, neck or body of the pancreas
	IVa	Communication with pancreatic duct (+)
	IVb	Distance between cyst and gastrointestinal wall < 1 cm
	IVc	Neither IVa nor IVb applies
V		Pseudocyst located in the tail of the pancreas
	Va	Splenic vein involvement or upper gastrointestinal bleeding
	Vb	Distance between cyst and gastrointestinal wall <1 cm, without splenic vein involvement or upper gastrointestinal bleeding

In our case, the patient was a 6-year-old girl. Her age is in line with the literature, which reports an average age of 7.5 years [1, 10]. The onset of the disease was insidious, with abdominal pain, deterioration in general condition and a gradually building abdominal mass. This is a common mode of onset [3, 8], but can sometimes lead to mechanical or infectious complications [1, 3, 8]. The diagnosis is made on imaging. As in this case, abdominal ultrasound is indicated as the first line of defence but may be limited in its description. Abdominal and pelvic CT scans, without and with injections, provide an accurate description of the lesions used to make the diagnosis [8]. In the case of our patient, it revealed images suggesting pancreas divisum, one of the rare aetiologies of pancreatitis. This was the cause of the pancreatic pseudocyst presented by the child. Bilio-pancreatic MRI, which was not performed in our patient, was used to search for any anatomical variants of the pancreatic ducts that might favour pancreatitis.

Biological tests revealed acute pancreatitis. According to Chaudhari et al [8], if pancreatitis is suspected, amylase and lipase levels should be measured, as they can support a clinical diagnosis. In this case, where no malformative lesion is described on CT scan and in the absence of trauma, acute pancreatitis appears to be the most likely aetiology, consistent with elevated pancreatic enzymes. However, it is regrettable that tumour markers are not tested in the cystic fluid to rule out a tumour origin. The impossibility of carrying out this work-up in our context was the limitation.

Initial management of pancreatic pseudocysts involves bowel rest and total parenteral nutrition [11]. For surgery, maturation of the cyst is essential. The literature describes a delay of 2-6 weeks [2, 8]. We waited six weeks to obtain a thick enough cystic wall to allow anastomosis. The choice of surgical drainage or removal depends on the anatomy of the pseudocyst [12]. Because of the location of the cyst, we opted for marsupialization. He therefore underwent trans-gastric cysto-gastrostomy by left transverse laparotomy. There are many different therapeutic alternatives, ranging from monitoring [2, 9, 11] to echo-guided drainage and endoscopic or open surgery (internal drainage by cysto-gastrostomy or cysto-enterostomy). The comparative effectiveness of endoscopic and open surgery appears to be the same. Provided the technical facilities are available, endoscopy remains the treatment of choice [2]. In our context, the absence of endoscopic surgery justifies laparotomy.

CONCLUSION

Pancreas divisum is a malformative aetiology of pancreatitis in children and deserves to be known by medical staff. It must be treated appropriately to avoid progression to a pancreatic pseudocyst. Cysto-digestive bypass by laparotomy remains an effective means of management in low-income countries that do not have an innovative technical platform for minimally invasive surgery.

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