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A retrospective study on surgical management of chronic pancreatitis in Chinese children.

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Abstract

Pancreatic diseases in the children include a wide spectrum such as acute pancreatitis, acute recurrent pancreatitis, chronic pancreatitis (CP) and pancreatic disease without pancreatitis, and the management of these diseases are quite different from those in the adults. In this study we retrospectively analyzed the pathogenesis and management of CP in 12 Chinese children (7 male and 5 female, aged 6 to 12 years old). Laboratory examinations showed that serum levels of amylase and lipase increased in all patients. Radiological examinations showed that 2 children had pancreatic duct stricture, 3 children had pancreatic atrophy, 3 children had pancreatic duct dilation with pancreaticobiliary malunion, and 4 children had pancreatic duct dilation with stones. For surgical treatment, 5 patients received longitudinal pancreaticojejunostomy and 7 patients received distal pancreatectomy with Roux-en-Y pancreaticojejunostomy. All patients had good outcomes without postoperative complications. The follow-up ranged from 1.5 year to 4.5 years, and all patients had no recurrent abdominal pain. Our study suggests that individualized management for CP in the children is necessary and effective.

Keywords: Chinese, Chronic pancreatitis, Children, Surgery, Anesthesia.

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Introduction

Pancreatic diseases in the children include a wide spectrum such as acute pancreatitis (AP), acute recurrent pancreatitis (ARP), chronic pancreatitis (CP) and pancreatic disease without pancreatitis, and the management of these diseases are quite different from those in the adults [1]. Among them, CP is a big challenge for clinical management. Children with CP present clinical symptoms such as persistent abdominal pain, weight loss, steatorrhea and jaundice, and they are usually managed by conservative treatments to avoid invasive surgical intervention [2,3].

In China, the incidence of CP in the children used to be very low. However, with the change of lifestyle and the application of radiologic and endoscopic techniques, increasing cases of CP have been reported recently [4]. Therefore, there is urgent need to develop up-to-date strategies for the diagnosis and therapy of CP in Chinese children. In this study we retrospectively analyzed the pathogenesis and management of CP in 12 Chinese children.

We found that these patients had different causes of CP and their diseases were successfully managed by different surgical procedures.

Patients and Methods

Patients

Twelve children who were hospitalized and diagnosed with CP at West China Hospital, Sichuan University between 2012 and 2014 were enrolled in this study. These patients included 7 male and 5 female and they were 6 to 12 years old (Table 1).

Diagnosis

After the patients were admitted into our hospital, laboratory examinations including the tests for serum amylase and lipase and ultrasound examinations such as computed tomography (CT) or endoscopic retrograde cholangiopancreatography (ERCP) were performed. Because children could not tolerate ERCP, ERCP was completed using general anesthesia. Based on the results of these examinations and clinical symptoms the patients were diagnosed as CP.

Surgical procedures

All enrolled patients received surgical therapy because conservative treatment was ineffective. The operative approach in each case was dictated by clinical manifestations and the results of CT or ERCP. The patients received either longitudinal pancreaticojejunostomy (Puestow procedure) or

distal pancreatectomy with Roux-en-Y pancreaticojejunostomy (Duval procedure). All surgical procedures were performed under general anesthesia with endotracheal intubation. The patients were kept supine position with the feet lower than the head.

Results

All patients presented persistent abdominal pain. Most of the patients had nausea and anorexia as well as weight loss. In most patients, baseline chronic pain was exacerbated by eating. Laboratory examinations showed that serum levels of amylase and lipase increased in all patients. CT and ERCP showed that 2 children had pancreatic duct stricture, 3 children had pancreatic atrophy, 3 children had pancreatic duct dilation with pancreaticobiliary malunion, and 4 children had pancreatic duct dilation with stones (Table 1). For surgical treatment, 5 patients received longitudinal pancreaticojejunostomy (Puestow procedure) and 7 patients received distal pancreatectomy with Roux-en-Y pancreaticojejunostomy (Duval procedure) (Table 1). All patients had good outcomes without postoperative complications. The follow-up ranged from 1.5 year to 4.5 years and all patients had no recurrent abdominal pain.

Table 1. *Management of CP in 12 Chinese children.*

Age (years)	Gender	Manifestations	Diagnosis	Surgery	Outcome
6	M	Abdominal pain	PDD with stones	Duval procedure	Good after
		Weight loss	(by CT)		1.5 years follow-up
6	M	Abdominal pain	PDD with PBM	Puestow procedure	Good after
		Jaundice	(by ERCP)		3 years follow-up
7	M	Abdominal pain	PDD with stones	Duval procedure	Good after
		-	(by CT)		2.5 years follow-up
7	F	Abdominal pain	Pancreatic atrophy	Duval procedure	Good after
		Weight loss	(by CT)		4.5 years follow-up
7	F	Abdominal pain	PDS	Puestow procedure	Good after
		Weight loss	(by ERCP)		2 years follow-up
8	M	Abdominal pain	Pancreatic atrophy	Duval procedure	Good after
		-	(by CT)		1.5 years follow-up
8	F	Abdominal pain	PDS	Duval procedure	Good after
		Weight loss and Jaundice	(by ERCP)		1.5 years follow-up
9	M	Abdominal pain	PDD with PBM	Puestow procedure	Good after
		Jaundice	(by ERCP)		4 years follow-up
9	F	Abdominal pain	PDD with stones	Puestow procedure	Good after
		Weight loss	(by ERCP)		1.5 years follow-up
11	M	Abdominal pain	PDD with stones	Duval procedure	Good after
		-	(by ERCP)		1.5 years follow-up
11	F	Abdominal pain Jaundice	Pancreatic atrophy	Puestow procedure	Good after
		-	(by CT)		1.5 years follow-up
12	M	Abdominal pain	PDD with PBM	Duval procedure	Good after
		Weight loss	(by ERCP)		3 years follow-up

PDD: Pancreatic Duct Dilation; PDS: Pancreatic Duct Stricture; PBM: Pancreaticobiliary Malunion; CT: Computed Tomography; ERCP: Endoscopic Retrograde Cholangiopancreatography

Discussion

The most common cause of CP in the adults is long-term alcohol abuse, which is unlikely to account for CP in the children. Genetic factors as well as pancreatic anatomic abnormality, biliary disorder and trauma have been proposed as possible causes of CP in the children, but sometimes CP is idiopathic [5,6]. Other causes of CP such as infection should also be considered [7]. Anatomic abnormality could lead to the obstruction of pancreatic duct and the inflammation of pancreatic epithelium, resulting in fibrosis [8]. Recurrent abdominal pain is the predominant symptom of CP although other typical symptoms include weight loss, jaundice, and diabetes [5]. In this study, we found that all children had abdominal pain, but only some of them have symptoms such as jaundice and diabetes. Therefore, abdominal pain is considered the main clinical manifestation of CP in the children. The onset of CP is usually accompanied by increased serum amylase and lipase levels. In this study, laboratory examinations showed that serum amylase and lipase levels increased in all children patients, consistent with the diagnosis criteria of CP.

Because most children with CP do not present all typical symptoms, the diagnosis of CP mainly depends on imaging techniques, which could reveal even small changes in the structure and size of the pancreas and detect pancreatic duct dilation, atrophy and pancreatic duct stricture [9]. In this study, we used CT and ERCP and found pancreatic abnormalities such as pancreatic duct stricture, pancreatic atrophy, pancreatic duct dilation with pancreaticobiliary malunion, or pancreatic duct dilation with stones in all patients. Based on the combination of clinical manifestations, laboratory examinations and imaging techniques, we could accurately diagnose CP in all patients.

Surgery is important for the management of CP in patients who fail conservative treatments [10-12]. In this study, pancreatic duct abnormalities and pancreatic atrophy were regarded as the indications for surgical treatment. The main surgical procedures for CP in the children include drainage (bile and pancreatic liquid drainage) and pancreatectomy [11]. Recently, longitudinal pancreaticojejunostomy (Puestow procedure) and distal pancreatectomy with Roux-en-Y pancreaticojejunostomy (Duval procedure) have become increasingly to be used for pancreatic duct drainage because they are less invasive and cause few complications and mortality [13]. Puestow procedure has been shown to reduce intraductal pressure and relieve pain in CP patients [14]. Duval procedure may help alleviate long-term pain in CP patients because this procedure involves the resection of the pancreatic tail, the region with extensive interstitial fibrosis. Duval procedure has been used in combination with Roux-en-Y pancreaticojejunostomy to drain pancreatic liquid in children with CP [5]. In contrast, total pancreatectomy is seldom performed in children with CP because it is highly invasive and causes a variety of complications [15]. Therefore, in this study we mainly performed Puestow procedure and Duval procedure in 12 children with CP, and the outcomes were satisfactory because the patients had no postoperative complications and abdominal pain did not recur after a long-term follow-up.

Several limitations of this study should be pointed out. First, this study is retrospective. Second, this study involves single-center site. Third, the number of patients enrolled in this study is small. Further large scale and multi-center studies are needed to extend our experiences for management of CP in children.

In conclusion, CP in the children has different pathogenic causes and clinical manifestations from the adults. The combination of clinical manifestations, laboratory examinations and imaging techniques are necessary for accurate diagnosis of CP. Selection of suitable surgical procedures is effective for individualized management of CP in the children.

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