The role of ERCP in the treatment of recurrent acute pancreatitis

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ABSTRACT

Introduction. The incidence of acute pancreatitis is increasing in the pediatric population. Up to 35% of children have recurrence secondary to anatomical variations of the pancreatic duct. In this context, endoscopic retrograde cholangiopancreatography (ERCP) stands as a key diagnostic and therapeutic tool.

Clinical case. We present two cases of recurrent acute pancreatitis (RAP) in 2 adolescents aged 14 and 15 years old. Apart from small gallstones in the gallbladder in one of them, bile duct or pancreatic duct disorders were not identified at either ultrasonography or nuclear magnetic resonance cholangiopancreatography (NMRCP). In both cases, diagnosis was established through ERCP, with two ERCPs required in each case before accurate diagnosis was achieved. ERCP had to be repeated as a result of technical issues in one case, and due to lack of relevant findings in the other. RAP episodes ceased after plastic prostheses had been placed in the pancreatic duct.

Discussion. Anatomical variations of the pancreatic duct are a cause of RAP in the pediatric population. ERCP allows diagnosis to be established even when regular imaging studies are not conclusive.

KEY WORDS: Pancreatitis; Cholangiopancreatography, endoscopic retrograde; Pediatrics.

EL PAPEL DE LA CPRE EN EL TRATAMIENTO DE PANCREATITIS AGUDA RECURRENTE

RESUMEN

Introducción. La incidencia de pancreatitis aguda está aumentando en la población pediátrica y hasta el 35% de los niños presentan cuadros recurrentes secundarios a variaciones en la anatomía de los conductos pancreáticos. En este contexto, la colangiopancreatografía retrógrada endoscópica (CPRE) es una herramienta fundamental tanto diagnóstica como terapéutica.

Caso clínico. Se presentan dos casos de pancreatitis agudas recurrentes (PAR) en 2 adolescentes de 14 y 15 años. Aparte de microcáculos en la vesícula biliar en uno de ellos, ni la ecografia ni la colangio-RMN identificaron alteraciones en vía biliar o conductos pancreáticos. En ambos casos el diagnóstico se obtuvo mediante CPRE, requiriendo 2 CPRE en cada caso para llegar al diagnóstico correcto. La CPRE se repitió por problemas técnicos en un caso y por ausencia de hallazgos relevantes en otro. Los episodios de PAR se resolvieron tras la colocación de prótesis plásticas en el conducto pancreático.

Comentarios. Las variaciones anatómicas del conducto pancreático son causa de PAR en población pediátrica. La CPRE permite el diagnóstico incluso cuando los estudios de imagen habituales no son concluyentes.

PALABRAS CLAVE: Pancreatitis aguda recurrente; Colangiografía retrógrada endoscópica; Pediatría.

INTRODUCTION

The incidence of acute pancreatitis has increased in the pediatric population, and up to 35% of children have recurrence[1,2]. Potential causes of recurrent acute pancreatitis (RAP) in childhood include bile duct obstruction, idiopathic causes, genetic disorders, and anatomical malformations[1,2]. Anatomical variations of the pancreatic duct are typically asymptomatic and incidentally identified in imaging studies during adulthood, but they can occasionally occur along with RAP[3]. In this context, endoscopic retrograde cholangiopancreatography (ERCP) stands as an important tool in difficult diagnoses in terms of etiological research, pancreatic anatomy assessment, and disease management and treatment[4].

We present two cases of RAP secondary to pancreatic duct malformations successfully treated with ERCP.

CLINICAL CASE

Case 1

A 14-year-old male patient presented at the Emergency Department. He had been diagnosed with severe pancreati-

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tis after eight episodes that had been managed and treated in other departments over 1 year. In the diagnostic process, no alterations in bilirubin, hepatic enzyme, or lipase levels were detected, but a 2,133 IU/L amylase increase (reference: 110 IU/L) was noted. Abdominal ultrasonography and nuclear magnetic resonance cholangiopancreatography (NMRCP) showed sludge and small gallstones in the gallbladder, with no bile duct or pancreatic duct disorders. In spite of the report being normal, nuclear magnetic resonance cholangiopancreatography suggested tortuosity in the main pancreatic duct, which led to endoscopic ultrasonography. Endoscopic assessment showed dilatation of the main dorsal pancreatic duct associated with a "pancreatic loop" and stricture in the cephalic portion. However, no small gallstones were identified, which ruled out cholecystectomy. ERCP was conducted in an external department. Difficulties were encountered to pass the guidewire to the pancreatic body and tail –potential anatomical disorders or duct stricture were considered–, and pancreatic access with a papillotome was unsuccessfully tried. A new attempt was made three months later. The main duct was found to be angulated, and a loop associated with annular stricture and dilatation of the distal pancreatic duct was evidenced. The main duct was rectified by placing a catheter and a 4Fr x 10cm pancreatic prosthesis (Fig. 1). The patient has had no further episodes of pancreatitis since the procedure was carried out one year ago. He is currently undergoing regular follow-up of the pancreatic prosthesis every six months.

Case 2

A 15-year-old female patient with episodes of recurrent abdominal pain since she was 6 years old presented at out department. She had been diagnosed with RAP at the age of 9, with a mean of 1 episode annually. When she was admitted, no alterations of bilirubin or hepatic enzyme levels were observed, but a 566 IU/L amylase increase and a 4,607 IU/L lipase increase (reference: 300 IU/L) were detected. Ultrasonography and CT-scan were carried out, with no structural disorders identified. Nuclear magnetic resonance cholangiopancreatography was then conducted. It demonstrated that the bile ducts had a normal caliber and normal contours, with no filling defects suggestive of gallstones. The gallbladder walls proved to be thickened, and biliary sludge was found. The pancreatic duct had a normal caliber and normal contours.

After clinical treatment, she underwent elective laparoscopic cholecystectomy. However, following surgery, the episodes of pancreatitis became more frequent (2-3 episodes annually). ERCP was conducted, with no biliopancreatic duct system dilatation or irregularities. Therefore, papillotomy was ruled out. The patient had to be re-admitted several times as a result of further episodes of pancreatitis, and given that control tests were inconclusive, a new ERCP was decided upon. In the new procedure, selective catheterization of the main pancreatic duct was carried out with no difficulties, and main pancreatic duct body and tail dilatation was identified. Dilatation measured 7 mm in the larger axis, with a segmentary area of irregular stricture in the cephalic segment, as well as secondary duct dilatation. Pancreatic sphincteroplasty was conducted, CRE balloon cephalic pancreatic duct dilation up to 6 mm was carried out, and an 8.5Fr x 9cm plastic prosthesis was placed. The procedure was conducted uneventfully, with good contrast drainage at the end of the examination (Fig. 2). Following the procedure,

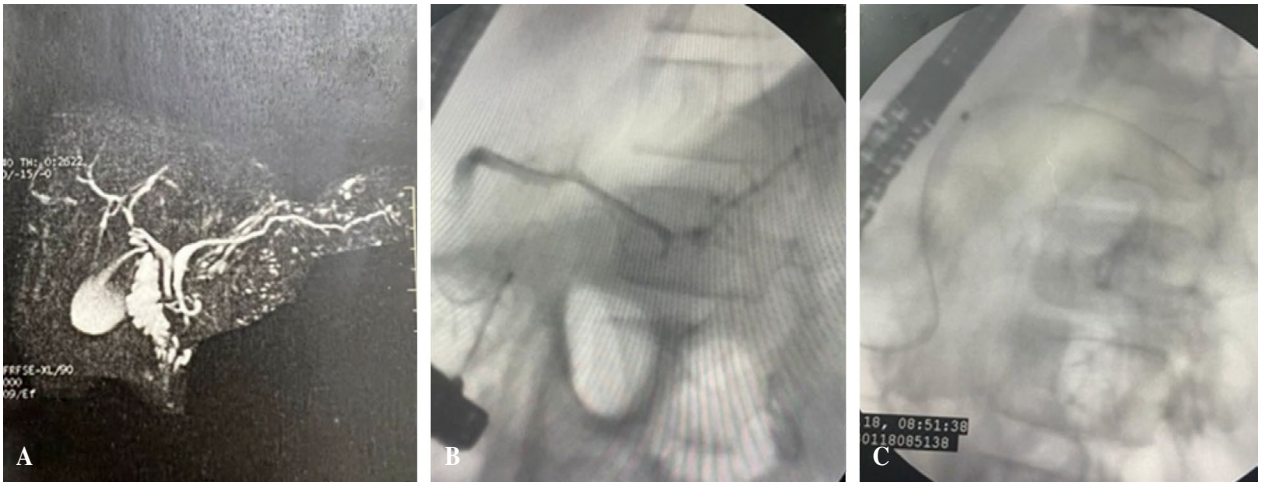

Figure 1. A) NMRCP showing an atypical sinuous trajectory of the main pancreatic duct. B) Following contrast injection, the main pancreatic duct is angulated in the form of a loop (pancreatic loop), associated with annular stricture and distal duct dilatation. C) Good contrast drainage following duct rectification and plastic prosthesis placement.

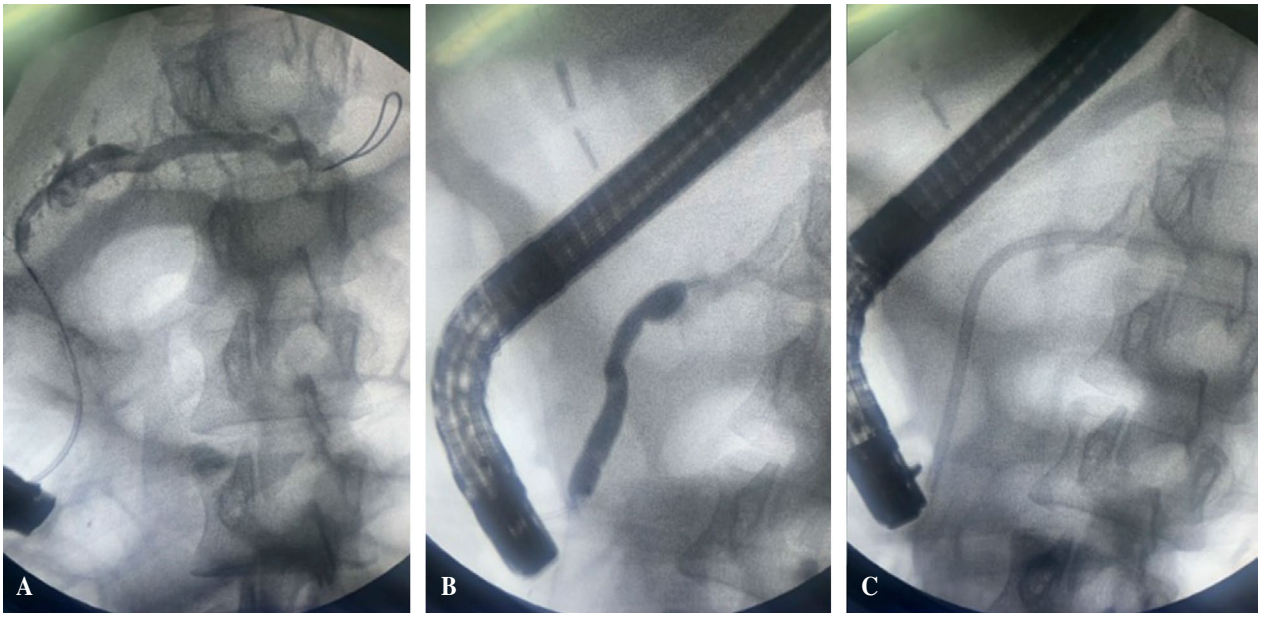

Figure 2. A) Body and tail main pancreatic duct dilatation, with an irregular stenotic area in the cephalic segment and a small secondary duct dilatation. B) Balloon cephalic dilation and plastic prosthesis placement, with the distal end positioned in the distal body of the pancreas. C) End of examination: good contrast drainage.

the patient adequately accepted oral nutrition, and abdominal pain improved. She is now undergoing outpatient follow-up in our department. She has been asymptomatic for the last eight months, with a regular follow-up of the prosthesis every six months.

DISCUSSION

RAP is defined as two or more episodes of acute pancreatitis interspersed with asymptomatic periods[1]. Apart from being a risk factor in the development of chronic pancreatitis (CP), it can cause social, functional, and economic damage to pediatric patients and their families[2,5]. Congenital abnormalities of the pancreatic duct[5] are one of the main causes of RAP.

Pancreas divisum is caused by an abnormal fusion of the dorsal and ventral pancreatic buds during embryonic development. It represents a separate risk factor in terms of RAP incidence and progression to CP[3,5]. This malformation is present in 3-14% of the population, and even though it is the most common congenital anatomical variation of the pancreas, other abnormalities can be associated with the etiology of RAP[3,5].

In clinical practice, these abnormalities can be assessed using imaging studies. In the cases reported herein, two pediatric patients had to be admitted in hospital multiple times as a result of pancreatitis. They underwent various imaging studies to identify the cause of the episodes. Abdominal ultrasonography was first conducted, but in light of the inconclusive results achieved, the patients underwent nuclear magnetic resonance cholangiopancreatography[1]. In Patient 1, even though nuclear magnetic resonance cholangiopancreatography was normal, a comprehensive analysis showed an atypical trajectory of the main pancreatic duct, which led to endoscopic ultrasonography and a new ERCP. In Patient 2, ERCP was indicated due to persistent pancreatitis, even though previous NMRCP was normal.

Pancreatitis is a formal indication for ERCP in children. It is crucial both in terms of etiological assessment and anatomical description of the pancreas, and in many cases, it can play a therapeutic role[4]. ERCP can be considered to assess pancreatic duct dilatations and for decompression purposes using stents and/or papilotomy[4].

Patient 1 had a pancreatic duct with a sinuous trajectory in the form of a loop along with annular stricture. Patient 2 had stricture in the cephalic segment of the pancreatic duct, aside from hematic content drainage following duodenal papilla catheterization (*hemosuccus pancreaticus*), probably related to the formation of pancreatic visceral artery pseudoaneurysms and the progression of RAP to CP[6,7]. In both cases, pancreatic secretion drainage was probably compromised, resulting in reflux, stasis, and intra-pancreatic digestive enzyme activation. Decompression was achieved using plastic prostheses, which were also employed in Patient 1 to rectify the pancreatic duct.

Immediately following ERCP, patients had a good tolerance to diet, with progressive and full improvement in terms of pain. According to the literature, pain control

and analgesics reduction are primary success markers of decompression, and they should be considered before more invasive surgical procedures are decided upon[4]. Our patients are currently undergoing outpatient follow-up, with no further episodes of pancreatitis since surgery. Control ERCPs are scheduled to assess the plastic devices, according to the recommendations currently in force[4]. The idea is to remove the devices 12 to 14 months after they were placed, since prostheses typically become obstructed in the long-term, thus causing infectious complications[8].

In conclusion, the objective of this paper was to highlight the anatomical variations of the pancreatic duct as a cause of recurrent acute pancreatitis in children, as well as to underline the importance and effectiveness of ERCP, even when regular imaging studies are not conclusive.

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