Acta Scientific Gastrointestinal Disorders

Volume 1 Issue 1 September 2018

Research Article

Endoscopic Treatment of Biliopancreatic Affections in Children. Experience in Cuba

Raúl A Brizuela Quintanilla[1]*, Juan Yerandy Ramos Contreras[2], Julián F Ruiz Torres[3], Samira Becil Poyato[4], Jorge García-Menocal Hernández[2], Norberto Alonso Contino[2] and Ramón Villamil Martínez[5]

[1]Second Degree Specialist in Gastroenterology, Full Professor, Ministry of Public Health, National Center for Minimal Access Surgery, Havana, Cuba

[2]Second Degree Specialist in Gastroenterology, Ministry of Public Health, National Center for Minimal Access Surgery, Havana, Cuba

[3]Second Degree Specialist in Gastroenterology, Associate Professor, Ministry of Public Health, National Center for Minimal Access Surgery, Havana, Cuba

[4]First Degree Specialist in Anesthesiology and Resuscitation, Ministry of Public Health, National Center for Minimal Access Surgery, Havana, Cuba

[5]Second Degree Specialist in Pediatric Surgery, Ministry of Public Health, National Center for Minimal Access Surgery, Havana, Cuba

***Corresponding Author:** Raúl A Brizuela Quintanilla, Second Degree Specialist in Gastroenterology, Full Professor, Ministry of Public Health, National Center for Minimal Access Surgery, Havana, Cuba.

Received: May 23, 2018; **Published:** August 14, 2018

Abstract

An observational descriptive cross-sectional study was conducted of the records of 53 endoscopic retrograde cholangiopancreatographies (ERCPs) performed on 31 patients of pediatric age with suspected biliopancreatic disorders at the National Center for Minimal Access Surgery over a period of 2 years and 7 months, from 11 February 2013 to 28 July 2015. Of the total patients, 8 (27%) were male and 22 (73%) female; 14 (26%) were diagnostic and 39 (74%) therapeutic. The primary indication was to study pain with enzyme elevation in 27 (50%), and the main diagnosis was benign post-surgical common bile duct stenosis of the choledocho-choledochus anastomosis in 14 patients (26%), followed by 10 normal ERCPs (19%). The most common intervention was endoscopic sphincterotomy (16) for prosthesis placement (7), followed in frequency by calculus removal (6). Complications occurred in 2 cases, one (2%) in 21 therapeutic procedures, and one (2%) in diagnostic procedures. Mortality was zero. Our results show the great diagnostic usefulness, therapeutic success and minimal complications of ERCP in pediatric patients.

Keywords: Endoscopic Retrograde Cholangiopancreatography; Sphincterotomy; Choledocholithiasis; Liver Transplantation

Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) is a very demanding endoscopic procedure in pediatrics. ERCP is the most sensitive and specific technique for evaluation and treatment of children with suspected pancreatic and bile duct disorders, only preceded by nuclear magnetic cholangioresonance. Its disadvantage is being an invasive procedure that requires general anesthesia [1,2].

Due to the relatively low incidence of clinical suspicion of disease, the limited availability of pediatric duodenoscopes, the need for pediatric endoscopists well trained in ERCP, the scant use of the procedure, the impression that ERCP is technically hard to achieve in children, as well as the difficulty to effectively evaluate the therapeutic results, the use of this technique in children has been limited, and therefore indications about ERCP and its safety with children have not been well defined in some countries [3,4].

The procedure was introduced in Cuba in the year 2008 at the National Center for Minimal Access Surgery in Havana, to treat children from pediatric hospitals in the capital. Sporadic at first, in the year 2012 it began to be offered in a stable, systematic manner, thus generating the information herein presented.

The purpose of this report is to show the results achieved by our team in the use of therapeutic ERCP with a group of pediatric patients with biliopancreatic disorders.

Materials and Methods

An observational descriptive cross-sectional study was conducted of the records of 53 ERCPs performed on 31 pediatric patients with suspected biliopancreatic disorders at the Therapeutic Endoscopy Service of the National Center for Minimal Access Surgery (CNCMA) in Havana, Cuba, from 11 February 2013 to 28 July 2015. Clinical parameters, indications, diagnoses and complications observed during and after the procedure were obtained from the Center's database (ProGastro v12.11.14.94). The following equipment was used to perform the ERCPs and the various procedures: EVIS Lucera CV 260SL and CLV-260SL sets and videoduonenoscopes TJF-240, TJF-260V (Olympus® Co, Tokyo, Japan), electrosurgical unit VIO 200 D.ERBE® (ERBE-GmbH®, Berlin, Germany) and accessories; pointed sphincterotomes KD-5, traction sphincterotomes type KD-30Q-1 (Olympus® Co, Tokyo, Japan), set of 10 Rf straight biliary endoprostheses, and 5 Rf and 7 Rf straight plastic pancreatic or double pigtail prostheses (Olympus® Co, Tokyo, Japan), 0.035 mm hydrophilic guides type Bavarian Wire® (MediGlobe GmbH, Achenmühle, Germany), 6 Rf and 7 Rf Soehen-

dra, Cook, dilating catheters, and 5-7- 9-12 Rf progressive catheters (Wilson-Cook Medical® Inc. Winston-Salem, USA), Niti-S self-expandable metallic biliary prosthesis 6 x 10 mm removable cover (Taewoong Medical Ltd, Euromedical). Use was made of Tohiba® X-ray fluoroscopy equipment type Mobile C-Arm (Toshiba Medical Co Ltd, Otawara, Japan).

All patients received general orotracheal anesthesia, total intravenous mode (TIVA) with short-acting anesthetic agents in compliance with the protocol: Midazolam 0.03 - 0.05 mg/kg, Fentanyl 2 - 3 µg/kg, Atracurium 0.5 - 0.6 mg/kg and Diprivan 1.5 - 2.5 mg/kg initially and in decreasing doses: 10 mg/kg/h, 8 mg/kg/h, 6 mg/kg/h, 4 mg/kg/h, with control of the heart rate (HR), non-invasive blood pressure (NIBP), oxygen saturation (SpO2), electrocardiogram (ECG), respiratory frequency (Rf), expired carbon dioxide (CO2), and peak airway pressure (P1). The following devices were used: SERVO 900D anesthesia equipment (SIEMENS-Elema, Switzerland), ST 6000 infusion pump (Samtronic SA, Brazil) and DOCTUS VI clinical parameters monitor (Combioned, Cuba).

Results are expressed in percentages rounded up to the nearest decimal value.

Results

A total 53 records were analyzed of ERCPs performed on 31 pediatric patients with suspected disorders of the biliopancreatic system. Mean age was 15 years (range 6 - 19 years); 22 patients (73%) were female and 8 (27%) were male.

Of the 53 ERCPs performed, 14 (26%) were diagnostic and 39 (74%) were therapeutic. Ten patients underwent more than one ERCP; most of them had undergone liver transplantation (4 patients, 20 ERCPs). The procedures indicated and the main diagnoses obtained from the records analyzed are shown in table 1. Several therapeutic procedures were used. Endoscopic sphincterotomy was the standard technique preceding other related procedures. These are shown in table 2. Of the total patients, two had complications related to the treatment: one was a female transplant recipient with post-surgical stenosis of the choledocho-choledochus anastomosis to whom a self-expandable metallic endoprosthesis had been placed, which had become epithelized and obstructed with biliary mud due to late attendance to her evolution appointment. She could not be brought to our institution for endoscopic treatment and had to be operated on in her own hospital. The second patient was found to have post-ERCP mild acute pancreatitis during a study for chronic calcifying pancreatitis. Mortality was zero.

Indication	Number of ERCPs (%)	Diagnosis	Number of ERCPs (%)
Pain and enzyme elevation (PFH, amylase, FA, GGT)	27	Benign post-surgical stenosis of choledocho-choledochus anastomosis	14
Biliary surgery complications (liver transplant)	4	Normal ERCP	10
Biliary lithiasis surgery complications	4	Obstruction of biliary endoprosthesis	6
Evaluation of bile duct endoprosthesis	16	Gallbladder lithiasis	5
Suspected choledochocele	2	Choledochal lithiasis	4
		Gallbladder and choledochal lithiasis	2
		Portal biliopathy	2
		Pancreatic pseudocyst	2
		Choledochele (type 1f CM)	2
		Residual choledochal lithiasis	2
		Chronic calcifying pancreatitis	1
		Choledochal ascariasis	1
		Internal bile leakage through clips	1
		External bile leakage	1

Table 1: Indications and diagnoses of the ERCPs performed (n = 53).

Source: ERCP database. CNCMA. 2013-2015

Discussion

Sex and mean age in our series are similar to those reported in studies about the most common conditions in pediatric ages. At institutions where ERCP is performed, children and adolescents are the greatest beneficiaries, since congenital diseases are most common in neonates, manifesting shortly after birth [5-8].

The main indication for ERCP (Table 1) was the study of abdominal pain with enzyme elevation, given the difficulty to determine the cause of this symptom, due to its subjective nature and the lack of studies to rule out biliary or pancreatic dysfunction or high resolution imaging tests such as magnetic cholangioresonance. Computerized axial tomography is not often used at these ages, due to its low specificity. Conventional ultrasonography is not commonly indicated either, for in most cases it only shows biliary tree dilatation, when this disorder is present. Performance of this technique is undoubtedly useful to diagnose post-surgical bile duct lesions in pediatric patients with liver transplant or biliary surgery complications, due to the possibility of solving these disorders at the moment they are identified, relieving patients of reinterventions which would affect their quality of life. In our sample the latter was the second reason for indicating the procedure, and a high

Therapeutic procedure	Number (%)	Complementary technique	Number (%)
Biliary sphincterotomy	16 (30)	Replacement of BD prosthesis	7 (13)
Papillary precut	2 (4)	Placement of BD prosthesis	7 (13)
Pancreatic sphincterotomy	1 (2)	Removal of BD calculi	6 (11)
Cystoduodenostomy	1 (2)	Removal of BD prosthesis	4 (8)
Double sphincterotomy (biliary and pancreatic)	1 (2)	Placement of two BD endoprostheses	2 (4)
		Placement of three BD endoprostheses	2 (4)
		Placement of self-expandable metallic endoprostheses in BD	2 (4)
		Placement of self-expandable metallic endoprostheses in pancreatic pseudocyst	1 (2)
		Removal of MPD calculi	1 (2)
		Placement of plastic multiperforated endoprosthesis in MPD	1 (2)
		Removal of foreign body (ascaris)	1 (2)

Table 2: Therapeutic procedures and complementary techniques applied (n = 53 CPREs performed).

Source: ERCP database. CNCMA. 2013-2015

Complication	Cause	Number (%)
Mild pancreatitis	Pancreatogram	1 (2)
Cholangitis due to obstructive cholestasis in transplant patient	Epithelization and obstruction of self-expandable metallic endoprosthesis in bile duct	1 (2)

Table 3: Complications in the 53 ERCPs performed.

Source: ERCP database. CNCMA. 2013-2015

rate of resolution of the condition was achieved. The technique also facilitates the diagnosis of chronic pancreatic diseases and biliary lithiasis, offering the possibility of applying either therapeutic or palliative treatments, such as biliary sphincterotomy and calculus removal, placement of endoprostheses and various combined procedures, as is shown in table 2.

ERCP results are shown in table 1, while table 2 contains the complementary techniques and procedures applied, the most outstanding of which were biliary sphincterotomy and the placement or replacement of bile duct endoprostheses. Congenital disorders, biliary parasitism and pancreatitis were less common, despite the fact that we receive patients from the country's main pediatric institution. All procedures were conducted with minimal risk for the children and were found to be in accordance with results reported by other adult centers were they are performed [9-17]. As to complications in the performance of invasive procedures, our results are similar to those reported in other series [9-17]. One female patient with an episode of mild acute pancreatitis and transient amylase elevation required observation for 72 hours. Another female patient had an obstructed, epithelized self-expandable metallic endoprosthesis adhering to the liver duct tissue which was impossible to remove and thus she had to be re-operated on to undergo choledocho-jejunostomy. This complication occurred because the patient did not attend her third-month consultation to evaluate removal of the endoprosthesis, which remained at its place for about eight months. No deaths occurred in our series (Table 3).

Conclusions

Our team has obtained good results in the performance of this technique on patients in pediatric ages, which is shown in the low morbidity observed. However, the procedure should be viewed as a therapeutic tool and other diagnostic alternatives be considered as well, since it is not entirely risk-free.

Bibliography

1. Durakbasa CU., *et al*. "Diagnostic and therapeutic endoscopic retrograde cholangiopancreatography (ERCP) in children and adolescents: experience in a single institution". *European Journal of Pediatric Surgery* 18.4 (2008): 241-244.

2. Taj MA., *et al*. "Endoscopic retrograde cholangiopancreatography: a therapeutic modality in children and adolescents". *Journal of Pakistan Medical Association* 62.2 (2012): 98-101.

3. Pant C., *et al*. "Trends in Endoscopic Retrograde Cholangiopancreatography in Children within the United States from 2000 to 2009". *Journal of Pediatric Gastroenterology and Nutrition* 59.1 (2014): 57-60.

4. Halvorson L., *et al*. "The Safety and Efficacy of Therapeutic ERCP in the Pediatric Population Performed by Adult Gastroenterologists". *Digestive Diseases and Sciences* 58.12 (2013): 3611-3619.

5. Liu W., *et al*. "Analysis of the role of endoscopic retrograde cholangiopancreatography in children with pancreaticobiliary diseases". *Zhonghua Er Ke Za Zhi. Chinese Journal of Pediatrics* 52.5 (2014): 328-332.

6. Cheng CL., *et al*. "Diagnostic and therapeutic endoscopic retrograde cholangiopancreatography in children: A large series report". *Journal of Pediatric Gastroenterology and Nutrition* 41.4 (2005): 445-453.

7. Rocca R., *et al*. "Therapeutic ERCP in paediatric patients". *Digestive Diseases and Sciences* 37.5 (2005): 357-362.

8. Pfau PR., *et al*. "Endoscopic retrograde cholangiopancreatography in children and adolescents". *Journal of Pediatric Gastroenterology and Nutrition* 35.5 (2002): 619-623.

9. Poddar U., *et al*. "Endoscopic retrograde cholangiopancreatography in the management of pancreaticobiliary disorders in children". *Journal of Gastroenterology and Hepatology* 16.8 (2001): 927-931.

10. Teng R., *et al*. "Endoscopic retrograde cholangiopancreatography in infants and children". *Journal of Gastroenterology* 35.1 (2000): 39-42.

11. Brown CW., *et al*. "The diagnostic and therapeutic role of endoscopic retrograde cholangiopancreatography in children". *Journal of Pediatric Gastroenterology and Nutrition* 17.1 (1993): 19-23.

12. Waye JD. "Endoscopic retrograde cholangiopancreatography in the infant". *American Journal of Gastroenterology* 65.5 (1976): 461-463.

13. Enestvedt BK., *et al*. "Endoscopic Retrograde Cholangiopancreatography in the Pediatric Population Is Safe and Efficacious". *Journal of Pediatric Gastroenterology and Nutrition* 57.5 (2013): 649-654.

14. Limketkai BN., *et al*. "Comparison of Performance and Safety of Endoscopic Retrograde Cholangiopancreatography Across Pediatric Age Groups". *Digestive Diseases and Sciences* 58.9 (2013): 2653-2660.

15. Rustagi T and Golioto M. "Diagnosis and therapy of pancreas divisum by ERCP: a single center experience". *Journal of Digestive Diseases* 14.2 (2013): 93-99.

16. Otto AK., *et al*. "Endoscopic retrograde cholangiopancreatography is safe and effective for the diagnosis and treatment of pancreaticobiliary disease following abdominal organ transplant in children". *Pediatric Transplantation* 16.8 (2012): 829-834.

17. Tannuri AC., *et al*. "Management of gallstone disease in children: a new protocol based on the experience of a single center". *Journal of Pediatric Surgery* 47.11 (2012): 2033-2038.

Volume 1 Issue1 August 2018