International Journal of Surgery Open 15 (2018) 14–17

Contents lists available at ScienceDirect

International Journal of Surgery Open

journal homepage: www.elsevier.com/locate/ijso

Case Series

Pioneering endoscopic retrograde cholangiopancreatography in a Sub Saharan African hospital: A case series

Okello Michael [a, *], Tumusiime Gerald [a], Nabimanya Viola [b], Baguma Steven [b], Ocama Ponsiano [a]

[a] Makerere University College of Health Sciences, P.O Box 7072, Kampala, Uganda
[b] Uganda Martyrs Hospital Lubaga, P.O Box 14130, Kampala, Uganda

ARTICLE INFO

Article history:
Received 21 June 2018
Received in revised form
4 October 2018
Accepted 6 October 2018
Available online 18 October 2018

Keywords:
ERCP
Sphincterotomy
Cholangiogram
Choledocholithiasis

ABSTRACT

Background and study aims: Although endoscopic retrograde cholangiopancreatography (ERCP) was introduced in Europe, Asia and America over four decades ago, East Africa and Africa as a whole has been slow in taking up this very important minimally invasive procedure for the management of various hepatopancreaticobiliary conditions. This has led to reliance on open surgery for even simple benign biliary strictures, stones and malignant causes of biliary and pancreatic duct obstruction that can be treated endoscopically without a need for a morbid open surgical intervention. In Uganda, ERCP was introduced in January 2017 after obtaining training and equipment support from Senior Experten Service (SES), German. We therefore report the first six cases of ERCP performed at our endoscopy unit.

Patients and methods: This is a case series report of six patients referred with yellowing of eyes and body itching as the main complaints. They predominantly had raised gamma glutamyl transferase (GGT), alkaline phosphatase (ALP), total bilirubin and direct bilirubin. They also had different imaging investigations demonstrating hepatic ducts dilatation.

Results: Four out of the six patients had complete post ERCP symptom resolution. One patient had partial symptom resolution and the other patient recovered after conversion to open surgery.

Conclusion: Collaborative skills transfer made ERCP feasible in our institute and this marked the start of this specialised service in Uganda.

1. Introduction

In developed countries, endoscopic retrograde cholangiopancreatography (ERCP) has advanced over the last four decades and is now an established standard of care for obstructive biliary and pancreatic disease [1] [2]. However, ERCP is not established in developing countries and this has led to reliance on open surgery for even simple biliary and pancreatic conditions that could have been managed through this minimally invasive technique [3] [4] [5]. This practice is likely to lead to increased morbidity and mortality especially among patients with comorbidities who cannot withstand the rigor of open surgery [6] [7]. These first six series of ERCPs were done in the endoscopy unit of the 275 bed-capacity Uganda Martyrs hospital Lubaga which is a private not for profit catholic church tertiary hospital in Kampala, Uganda. Prior to the start of ERCP, the chief surgeon who is the first author of this article underwent a series of trainings in endoscopic retrograde cholangiopancreatography (ERCP) at the Gastroenterology units of Albertinen Krankenhaus Hamburg, Klinikum Nürnberg Nord, Germany and Ibn Sina Hospital Khartoum, Sudan. ERCP was then introduced and below is our centre's retrospective review of the first six patients who consecutively underwent ERCP between January 2017 and September 2017. All the ERCPs were done by the chief surgeon who has been in-charge of both the surgery department and the endoscopy unit since 2013 and has performed over 1000 endoscopies 85% diagnostic and about 15% therapeutic. Therapeutic endoscopies being done before the introduction of ERCP included endoscopic foreign body removal, polypectomies, variceal band liagtion, esophageal stenting. All patients were stable prior to ERCP, received rectal diclofenac 100 mg at the start of the procedure as part of post ERCP pancreatitis prophylaxis and they were all done under general anaesthesia. This work has been reported in line with the PROCESS guidelines [8].

* Corresponding author.
E-mail addresses: dr.okelloaleleu@gmail.com, dr.okelloaleleu@mak.chs.ac.ug (O. Michael), tumurald@gmail.com (T. Gerald), vyolanm@gmail.com (N. Viola), steveleo13@gmail.com (B. Steven), ponsiano.ocama@gmail.com (O. Ponsiano).

https://doi.org/10.1016/j.ijso.2018.10.002

2. Case series

Patient 1: A 41-year-old Ugandan woman who was admitted with a one year and two months history of yellow discoloration of the eyes associated body itching.

On examination she was severely jaundiced and systemic examination was essentially normal.

The complete blood count revealed borderline leucocytosis of 12.62×10^9 and deranged liver function tests (LFTs): AST 885 U/L, ALT 297 U/L, ALP 1518 U/L, GGT 728 U/L, Albumin 3.1 g/dl, total bilirubin 5.5 mg/dl.

Abdominal ultrasound scan showed multiple gall bladder and CBD stones. ERCP was done and a partial sphincterotomy followed by stone extraction using a dormia basket. Post ERCP occlusion cholangiogram showed complete CBD stone clearance. On the 3rd Post ERCP day, the obstructive symptoms persisted and repeat abdominal ultrasound scan showed complete migration of all the gall bladder stones to the CBD. Repeat ERCP was done (Fig. 1) and complete stone clearance was obtained. Subsequent reviews at one month and at three months were unremarkable.

Patient 2: A 69 year old Rwandese male presented with progressive yellow discoloration of the eyes for two years associated with intermittent abdominal pain for two years. Significantly on examination he was severely wasted, deeply jaundiced with mild tenderness in the right upper quadrant.

The liver function tests were deranged; AST 82 U/L, ALT 57U/L, ALP 1235 U/L, GGT 292U/L, Albumin 2.71g/dl, total bilirubin 7.8 mg/dl, direct bilirubin 4.97 mg/dl. Abdominal computerized tomography scan revealed intra and extrahepatic duct dilatation. First ERCP attempt was not successful due to the impacted ampullary stone (Fig. 2), so a needle knife sphincterotomy was done and patient sent back to the ward. Repeat ERCP after 24 h led to stone fragmentation with partial CBD stone clearance. He was discharged on request with partial symptom resolution.

Patient 3: A 75-year-old Ugandan woman presented with a 3 month history of yellow discoloration of eyes and body itching. On examination, she was deeply jaundiced and systemic examination was essentially normal.

The liver function tests were deranged; AST 195 U/L, ALT 111 U/L, ALP 1218 U/L, GGT 1011 U/L, albumin 22 g/L, total bilirubin 17.13 mg/dl and CA 19-9 was 4316 U/ml.

MRCP showed dilated intra and extra hepatic ducts with ampullary stenosis, no stones or pancreatic tumor was seen.

At ERCP, a 1 cm distal CBD stricture was noted; partial sphincterotomy followed by balloon sphincteroplasty was done. She was discharged on the third post ERCP day with no complaints Post procedure resolution of symptoms was noted with normalization of the liver enzymes on subsequent outpatient follow up at two weeks and one month.

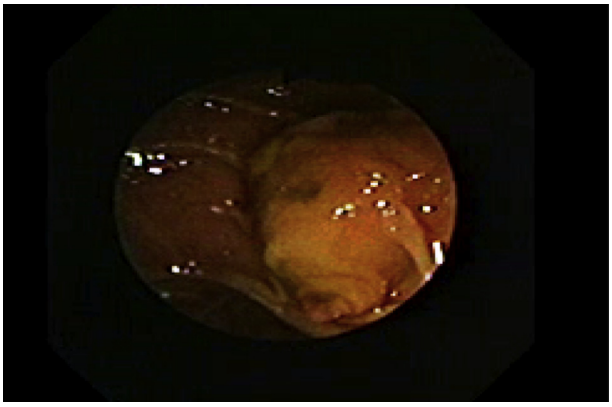

Fig. 2. Bulging ampulla of vater with partially necrotic spots due to impacted stone.

Patient 4: A 41-year-old Ugandan woman presented with abdominal pain for two and a half months with associated intermittent yellowing of eyes and body itching. On examination, she had a tinge of jaundice and abdominal exam revealed a palpable liver two finger breadth below the costal margin.

The liver function tests were minimally deranged; AST 44I U/L, ALT 45 U/L, ALP 289 U/L, GGT 99 U/L, Albumin 5.2 g/l, total bilirubin 3.2 mg/dl direct bilirubin 2.2 mg/dl. Abdominal ultrasound scan and CT scan revealed dilated intrahepatic ducts and grossly dilated and saccular common bile duct. She underwent ERCP.

At first ERCP attempt, CBD cannulation was unsuccessful but spontaneous expulsion of a small stone from the ampulla was noted during the suction process. ERCP was repeated 72 h later and sphincterotomy performed.

The patient remarkably improved with resolution of the jaundice and itching. She was discharged two days later with a diagnosis of a choledochal cyst and counseled for definitive surgery to excise the cyst.

Patient 5: A 50 year old male presented with yellowing of eyes, body itching and right upper quadrant pain for two weeks. On examination, he was deeply jaundiced with scratch marks all over the body; per abdomen, he had hepatomegaly of 6 cm below the costal margin and the rest of the examination was unremarkable.

The complete blood count was unremarkable with a hemoglobin level of 16.2 g/dl. He had elevated ALP 802 U/L, GGT 2766 U/L, AST 314 U/L, ALT 608 U/L, total bilirubin 8.33 mg/dl, direct bilirubin 7.39 mg/dl, but normal total protein of 7.3 g/dl and albumin of 4.1 g/dl.

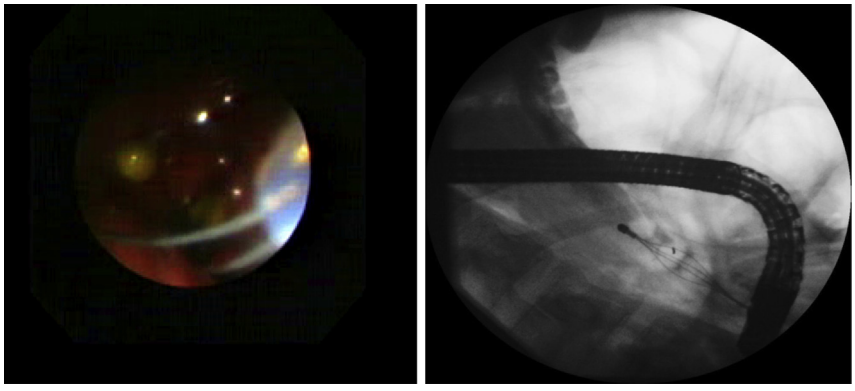

Fig. 1. Endoscopic and fluoroscopic images of CBD stone extraction by a dormia basket.

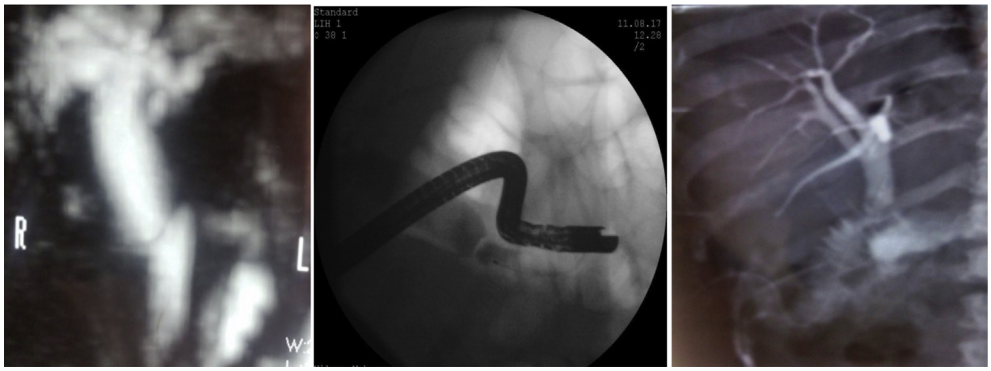

Fig. 3. Preoperative image of MRCP (left), ERCP(middle) of the same CBD stricture and extreme right is the postoperative cholangiogram showing biliary decompression with a mild leak.

At ERCP, we found a severe stricture at the mid to distal CBD with difficulty to maneuver the guide wire through (Fig. 3). After a 0.018 F guide wire was advanced through the stricture, the ERCP catheter could not go past the stricture. Procedure was terminated patient returned to ward and counseled for open surgery. He requested for some time and after 5 days he was taken for a laparotomy. At laparotomy a cholecystectomy followed by a roux-en-y hepaticojejunostomy with a distal jejunojejunostomy were performed, the mid CBD stricture was excised and distal CBD closed off. Trans-enteric cholangiography tube was left insitu and one abdominal drain below the bilio-enteric anastomosis.

Postoperatively, the patient developed a small leak which spontaneously resolved after 2 weeks. The patient was discharged after 4 weeks with complete resolution of the obstructive symptoms and normalization of the liver enzymes.

Patient 6: A 45 year old male presented with yellowing of eyes and intermittent body itching for one month. On examination, he was deeply jaundiced with generalized scratch marks; per abdomen, he had hepatomegaly of 4 cm below the costal margin, no palpable gall bladder.

Both abdominal ultrasound scan and abdominal CT scan demonstrated dilated intra and extrahepatic bile ducts with a common bile duct stone measuring 2.24 cm and no pancreatic lesion.

He had deranged liver function tests and ERCP was done. At ERCP, sphincterotomy and stone extraction was performed using a dormia basket (Fig. 4). The patient had complete resolution of the symptoms and was discharged three days post procedure.

3. Discussion

ERCP is very important in the management of biliary and pancreatic obstruction due to stones, tumor or strictures [9] [10]. Despite it's success in Europe, Asia, America and other developed countries, Africa and East Africa in particular has not built capacity in this very important minimally invasive mode of treatment for obstructive biliary and pancreatic diseases.

After doing diagnostic endoscopies for over four years, we introduced different endoscopic interventions in a staged manner; initially endoscopic foreign body removal, variceal band ligation, then esophageal stenting for cancer esophagus and endoscopic polypectomies. We then proceeded to start ERCP in January 2017 and we report the first six cases.

Four patients had CBD stones and had stone extraction after an initial partial sphincterotomy followed by a sphincteroplasty. This is consistent with the current endoscopic management of biliary stones though in most cases where the CBD stones are small, extraction with a dormia basket or stone extraction balloon is possible after just a sphincterotomy. This avoids the extra cost of doing a sphincteroplasty [11–14]. No patient got a severe form of post ERCP pancreatitis which is one of the most feared complications of ERCP [15].

One patient had papillary stenosis and underwent sphincterotomy followed by sphincteroplasty and we achieved complete symptom resolution, however, previous studies demonstrate that just sphincterotomy is sufficient [16]. The patient with a

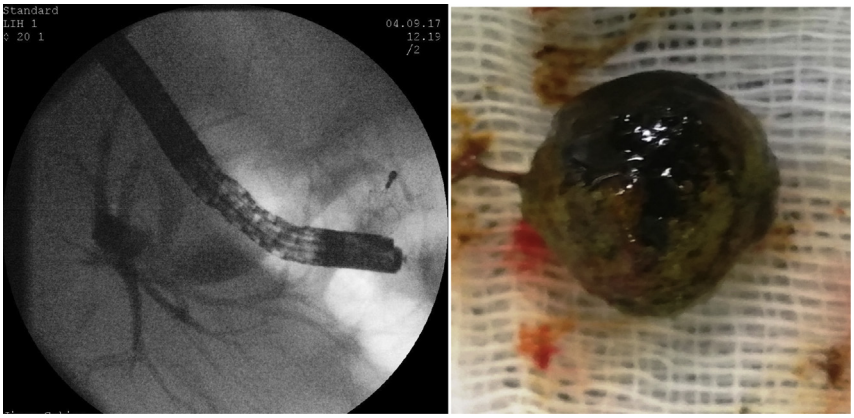

Fig. 4. ERCP cholangiogram showing a large CBD stone entrapped in the dormia basket that was removed successfully by straightening manouvre of the scope tip and withdrawing scope and trapped stone through the mouth.

choledochal cyst with a small impacted stone at the ampulla had improvement after a simple sphincterotomy. The patient was then counseled for definitive surgical excision of the choledochal cyst. ERCP in this case was only for the relief of the biliary obstruction from the impacted stone which is a known complication of patients with large choledochal cysts [17].

We were able to achieve deep CBD cannulation in the patient with severely stenotic CBD stricture using a small guide wire size 0.018 but unable to advance the stent past the tight stricture. He was then converted to open surgery. Deep CBD cannulation is the most important step for a successful ERCP for biliary conditions [18–20].

We therefore conclude that ERCP is feasible in Uganda and there is potential for it to grow and become the standard of care for the different obstructive biliary and pancreatic diseases. The technical and clinical success seen in this few cases is a good start for an initially absent service in the whole country of forty (40) million people.

As the service gains popularity, we recommend a larger prospective cohort study to evaluate the impact of ERCP on the management of hepatobiliary and pancreatic diseases in our setting.

Ethical approval

This study entitled "**Pioneering Endoscopic Retrograde Cholangiopancreatography in a Sub Saharan African Hospital: a case series**" was part of a review of records study entitle "**Endoscopic findings in patients who underwent gastrointestinal endoscopy in Uganda Martyrs' hospital, Lubaga Kampala: a review of records"**. This study was reviewing routine data collected during the course of the patient care in the hospital. Approval for the study and waiver of consent was granted by the local research and ethics committee (Makerere University School of Medicine Research and Ethics Committee REC REF 2017-123).

Funding

The study was funded by the authors with no other external source of funds.

Author contribution

Okello Michael, MBChB, M,Med,Surgery: the corresponding author and head surgeon conceived the idea, wrote the manuscript and performed all the ERCPs and the open surgery.

Nabimanya Viola, MBChB and Baguma Steven, MBChB assisted in the procedures, followed up the cases and also helped put the data together.

Tumusiime Gerald, MBChB, M,Med,Surgery: reviewed the manuscript for important intellectual content.

Ocama Ponsiano, PhD (Gastroenterology): the head physician reviewed the manuscript and gave it final approval.

Conflict of interest statement

All the authors declare no conflict of interest.

Guarantor

Dr. Michael Okello.

Research registration number

Research registry and unique identifying number: resear chregistry4053.

Consent

Written informed consent was obtained from the patients for publication of this case series and accompanying images. A copy of the written consents is available for review by the Editor-in-Chief of this journal on request.

References

[1] Cotton P, Kruse A. 40 years of interventional ERCP: stories from the pioneers volume 1 of 2. Channel Cook News Publ 2014;1(3).
[2] Cotton P. 40 years of interventional ERCP: stories from the pioneers volume 2 of 2. Channel Cook Med 2014;2(3).
[3] Chalya PL, Kanumba ES, Mchembe M. Etiological spectrum and treatment outcome of obstructive jaundice at a University Teaching Hospital in northwestern Tanzania: a diagnostic and therapeutic challenges. BMC Res Notes 2011;4(147):1–7.
[4] Ziady Chris, Bond Rober, Nwokolo Chuka, Mulder Chris JJ. Who will do an ERCP on me when I'm retired? S Afr Med J 2013;103(7):435.
[5] Perl D, Leddin D, Bizos D, Veitch A, Dow JN, Bush-goddard S, et al. Endoscopic capacity in west Africa. Afr Health Sci 2016;16(1):329–38.
[6] Riesco-lópez JM, Vázquez-romero M, Rizo-pascual JM, Rivero-fernández M, Manzano-fernández R, González-alonso R. Efficacy and safety of ERCP in a low-volume hospital. Rev Esp Enferm Dig 2013;105(2):68–73.
[7] Goumas K, Poulou A. Endoscopic management of common bile duct stones. In: Karaliotas CC, Broelsch CE, Habib NA, editors. Liver and biliary tract surgery. Vienna: Springer; 2006. p. 227–37.
[8] Agha RA, Fowler AJ, Rajmohan S, Barai I, Orgill DP, the PROCESS Group. The PROCESS statement: preferred reporting of case series in surgery. Int J Surg 2016;36(Pt A):319–23.
[9] Aparício DSP, Uemura RS, Jr CKF, Artifon ELA, Ana H, Santos C, et al. Biliary transpapillary endoscopic balloon dilation for treating choledocholithiasis. Soc Gastroentorol Peru 2015;35(3):231–5.
[10] Barreras JE. Endoscopic versus laparoscopic treatment for chole- docholithiasis: a prospective randomized controlled trial. Endosc Int 2016;4:1188–93.
[11] Bvm D, Cj T, Ks G, Dj M, Kirk G, Mckie L, et al. Surgical versus endoscopic treatment of bile duct stones (Review). Cochrane Collab 2013;12.
[12] Espinel-díez J, Pinedo-ramos E, Vaquero-ayala L, Álvarez-cuenllas B. Combined precut in difficult biliary cannulation. Rev Esp Enferm Dig 2013;105(6):334–7.
[13] Fang Y, Gurusamy KS, Wang Q, Davidson BR, Lin H. Pre-operative biliary drainage for obstructive jaundice. Cochrane Database Syst Rev 2014;9.
[14] Ghazal AH, Sorour MA, El-riwini M, El-bahrawy H. Single-step treatment of gall bladder and bile duct stones: a combined endoscopic – laparoscopic technique. Int J Surg [Internet] 2009;7(4):338–46. https://doi.org/10.1016/j.ijsu.2009.05.005. Elsevier Ltd.
[15] Pancreatitis P, Badalov N, Tenner S, Baillie J. The prevention, recognition and treatment of. J Pancreas 2009;10(2):88–97.
[16] Weitemeyer R1. Treatment of ampullary stenosis by endoscopic sphincterotomy. Am J Surg 1994;167(5):493–6.
[17] Naga MI, Suleiman DN. Endoscopic management of choledochal cyst. Gastrointest Endosc 2004:427–32.
[18] Tsuchida K, Iwasaki M, Tsubouchi M, Suzuki T, Tsuchida C, Yoshitake N. Comparison of the usefulness of endoscopic papillary large-balloon dilation with endoscopic sphincterotomy for large and multiple common bile duct stones. BMC Gastroenterol [Internet] 2015;15(59):1–6. https://doi.org/10.1186/s12876-015-0290-6.
[19] Madhoun MF, Wani S, Hong S, Tierney WM, Maple JT. Endoscopic papillary large balloon dilation reduces the need for mechanical lithotripsy in patients with large bile duct stones: a systematic review and meta-analysis. Diagn Ther Endosc 2014;2014(i). https://doi.org/10.1155/2014/309618. Hindawi Publishing Corporation.
[20] Lynn AP, Chong G, Thomson A. Endoscopic retrograde cholangiopancreatography in the treatment of intraoperatively demonstrated choledocholithiasis. Ann R Coll Surg Engl 2014;96(1):45–8.