

ORIGINAL STUDY

# Therapeutic biliary and pancreatic endoscopy in Qatar- a five year retrospective audit

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## INTRODUCTION

Endoscopic Retrograde Cholangiopancreatography (ERCP) is an advanced endoscopic procedure in which a specialized side viewing duodenoscope is passed into the duodenum, allowing accessories to be pushed via biliary or pancreatic ducts for diagnostic and therapeutic intervention. It is one of the most complex endoscopic procedures, requiring specialized equipment and proficient and skilled operators and assistants. Today therapeutic ERCP is the intervention of choice for many pancreaticobiliary disorders.

The Division of Gastroenterology & Endoscopy under the Department of Medicine has been performing ERCPs since the inception of the Endoscopy Unit in Hamad Medical Corporation (HMC), and it is the only endoscopy unit in Qatar performing ERCPs. We performed a retrospective audit of ERCPs performed over the last 5 year period from January 2006 to December 2010 in our Endoscopy unit.

## OBJECTIVES

Our aim was to audit the indications, findings, therapeutic interventions carried out, safety profile and technical success of endoscopic retrograde cholangiography (ERCP) carried out, during a 5 year period from January 2006 to December 2010.

## METHODS

Our data base of electronic and paper based ERCP reports between January 2006 and December 2010 was searched. Additional information if required was obtained from patient chart review from medical records. All ERCPs were performed by two experienced operators, during the entire study period. An ethical approval was obtained from the Research Committee of Hamad Medical Corporation.

Table 1.

Number of patients	456
Mean Age	51.64 years
Male/Female ratio	1.6:1
Number of procedures	621

## RESULTS

A total of 621 ERCP procedures were carried out on 456 patients over the 5 year study period. The mean age of the patients undergoing ERCP was 51.67 years with a male female ratio of 384: 237(1.6:1) (Table 1).

The pre procedure indication for ERCP was predominantly biliary indications (82.4%) of which the vast majority was done for calculus biliary disease (Table 2). Pancreatic indications were few (4.6%). The miscellaneous indications included biliary complications in post liver transplant patients.

Major reason for all biliary interventions was calculous biliary disease, requiring clearance of the common bile duct stones, post laparoscopic cholecystectomy biliary leak, biliary strictures and palliation of biliary obstruction due to malignancy.

Biliary interventions formed majority of (73.1%) all therapeutic interventions which were further comprised of papillotomy and common bile duct stone clearance with balloon or basket and biliary stenting for various indications (see Table 3). Pancreatic therapeutic interventions were few. Forty eight patients had incomplete procedures due to diverse reasons which included failed cannulation. Our initial cannulation success was 91.62%. In 52 patients we had failure in achieving deep biliary cannulation at the initial attempt. However on reattempts 24 – 72 hours after initial endoscopy, we succeeded in cannulation in 27 of these patients, thus giving an overall cannulation success rate of 95.97%.

Major complications encountered are mentioned in Table 4.

## DISCUSSION

Our center, which is the only endoscopy unit performing ERCPs in the State of Qatar has moderate volumes of activity in therapeutic biliary and pancreatic endoscopy with a volume of around 100 to 120 ERCPs per year<sup>1</sup>. Adequate volumes are needed to maintain proficiency and skills and individual endoscopists who perform more than 40 endoscopic sphincterotomies per year<sup>2</sup> or at

Table 2. Pre procedure indications.

Indications	Number
<b>Biliary indications</b>	<b>512</b>
Common bile duct stones	365
Post-operative biliary leaks	68
Biliary strictures	17
Stent exchange/ removal	11
Oriental Cholangitis	10
Biliary tumors	9
Biliary pancreatitis	22
Hydrated cyst	10
<b>Pancreatic indications</b>	<b>29</b>
Carcinoma pancreas	15
Recurrent pancreatitis workup	8
Pseudo cyst drainage	2
Pancreatic leak (post-traumatic)	4
<b>Miscellaneous</b>	<b>80</b>
Post liver transplant	12
Dilated CBD(suspected stones)	20
Extra biliary malignancy, causing biliary obstruction	23
Other indications	25

Table 3. Therapeutic Interventions.

<b>Biliary interventions</b>	
Papillotomy and clearance of common bile duct calculi	243
Papillotomy, incomplete common bile duct clearance and biliary stenting	6
Papillotomy and biliary stenting	141
Biliary stent exchange	64
Biliary stricture dilatation	9
Hydatid cyst drainage	2
Precut papillotomy	16
<b>Pancreatic interventions</b>	
Pancreatic papillotomy and stenting	5
Pancreatic duct stone clearance	1
Pseudocyst drainage	2
<b>Miscellaneous</b>	
Normal ERCP – no therapeutic interventions	64
Failed cannulation	25
Failure to cross tight CBD stricture? malignant	13
Ampulla biopsy only	5
Failure to visualize ampulla/ bleeding ampulla	2
Others/combinations	13
Ampulla mass – only biopsy	2
Procedures abandoned due to comorbidities	5
Deformed bulb – no access to ampulla	3

least one per week<sup>3</sup> have a lower complication rate than those who perform fewer procedures.

As a matter of policy we have been adhering to the recommendations of the consensus development conference sponsored by the National Institute of Health (NIH) in 2002, regarding indications for ERCP in our practice.<sup>4</sup> Since the avoidance of unnecessary ERCP is the best way to reduce complications, whenever possible we have used Magnetic Resonance Cholangio pancreatogram (MRCP) and Endoscopic Ultrasound (EUS) for diagnostic work, reserving ERCP as a purely therapeutic tool for the management of biliary and

pancreatic disease. ERCP, MRCP and EUS have comparable sensitivity and specificity for diagnosis of biliary and pancreatic disorders.<sup>5</sup> Most of our ERCPs were performed with a therapeutic intent. Two thirds of procedures were for therapeutic intent in a prospective survey of 2769 patients in Italy from 1992 to 1994.<sup>6</sup> With the advent and availability of new effective diagnostic tools like MRCP and EUS,<sup>7</sup> diagnostic ERCPs are hardly performed and this has been our experience as well. Despite their relative safety, diagnostic ERCPs have by no means had negligible complications. Serious complications from purely diagnostic ERCPs have been

Table 4.

Major post ERCP complications	Number of patients
Severe clinical pancreatitis (mortality – 1)	5 (1.09%)
Post procedure bleeding	5 (1.09%)
Perforation	1 (0.21%)
Major overall complications	11 (2.41%)

reported and this was mentioned in a study<sup>8</sup> which looked at claims for compensation from ERCP related complications. Among the nine fatal cases, the procedure was diagnostic in six, which were potentially avoidable ERCPs.

Clearance of common bile duct stones<sup>4</sup> and management of post-operative bile leaks formed the major indications for our biliary intervention.<sup>9</sup> We have undertaken ERCP as the first line therapy for the management of postoperative bile leaks as it is the accepted standard of care today.<sup>9</sup> ERCP was performed in the work up of Idiopathic Recurrent Acute Pancreatitis in 8 patients.<sup>10</sup> Palliation of malignant biliary obstruction formed another important indication for biliary drainage.<sup>11</sup> Placement of bridging or trans papillary pancreatic stent for pancreatic leak due to pancreatic duct disruption from trauma has been yet another indication for pancreatic endotherapy.<sup>12</sup> ERCP today is accepted as a tool for drainage of symptomatic pancreatic pseudocyst<sup>13</sup> and we have done successful pseudocyst drainage in a few patients. Biliary complications in our post liver transplant patients constituted another indication for biliary endotherapy. The commonest indication for ERCP in post-transplant patients was biliary strictures.<sup>14</sup>

Though hyperamylasemia is common after ERCP occurring in up to 75% of patients, acute clinical pancreatitis, defined as a clinical syndrome of abdominal pain and hyperamylasemia requiring hospitalization is much less common. In our audit there were 5 patients (1.2%) who developed severe clinical pancreatitis of which one suffered mortality. It has been our practice to avoid repeated pancreatic duct instrumentation or guide wire passage and to do limited pancreatic duct injections, which are well known risk factors for post ERCP pancreatitis.<sup>15</sup> Post ERCP acute pancreatitis can be graded as mild, moderate or severe based on the consensus definition.<sup>16</sup> Mild pancreatitis is defined as patients having serum amylase at least 3 times more than the normal 24 hours after the procedure, requiring admission or prolongation of planned admission by 2 to 3 days, moderate pancreatitis is severe enough to require hospitalization of 4 to 10 days and severe pancreatitis requires hospitalization for more than 10 days with phlegmon or pseudocyst which requires percutaneous intervention or surgery. The incidence of acute pancreatitis has been estimated in several large clinical trials and most studies demonstrate a rate of 4 to 5%. However our incidence of severe clinical pancreatitis of 1%, may be an underestimate since being a retrospective audit only severe cases of pancreatitis requiring prolonged in hospital stay were documented. Low complication rates could also be attributed to the fact that all procedures were performed by two

experienced operators during the entire study period. Operator experience and volumes are major factors determining outcomes and complications in ERCP.<sup>17</sup>

Bleeding was the most dreaded complication when therapeutic biliary interventions were first introduced.<sup>18</sup> Because of advance in equipment and better experience, it has become a relatively uncommon complication of ERCP and is mostly reported only after sphincterotomy. Post ERCP bleeding can be graded as mild, moderate or severe based on the consensus definition.<sup>16</sup> Mild bleeding is when there is clinical evidence of bleeding (not just endoscopic) with Hemoglobin(Hb) drop less than 3 gram % and without the need for transfusion. Moderate bleeding is defined as bleeding with need for transfusion of 4 units or less, but with no angiographic intervention or surgery. Severe bleeding is deemed to have happened with transfusion requirement of 5 units or more or in situations where intervention by angiography or surgery is required to control bleeding. We had 7 cases of bleeding (1.5%). 2 patients with clinical bleed did not require blood transfusion and had a Hb drop of less than 3 gram % and were managed with just local epinephrine injection and thus was deemed as mild bleeding. Another 5 patients required blood transfusion with local injection and heater probe injection, of which 3 patients achieved haemostasis and were considered to have moderate post ERCP bleed. The other 2 patients failed to achieve haemostasis with local measures, were transfusion dependent and eventually required surgery or angioembolisation and were categorized as severe post ERCP bleeders. Minor episodes of bleeding without > 1 gram Hb drop and with good haemostasis with local therapy were not considered to be a significant complication, in our analysis. Our practice ensured a platelet count above 80,000/cc and Internationalized Ratio (INR) < 1.2 as a requirement for all ERCPs which reduced complications from bleeding.<sup>19</sup> We had 1 incident of suspected perforation, which was managed conservatively.

We had an overall selective cannulation success rate of over 95%. We practice wire guided cannulation of the bile duct, which has improved success rates for selective biliary cannulation and reduced incidence of post ERCP pancreatitis.<sup>20,21</sup>

Limiting the privileges for therapeutic ERCP to two expert operators has probably kept the major complication rates low, despite our moderate volumes. In conclusion, our audit of ERCPs indicates judicious volumes of mostly biliary therapeutic interventions for diverse indications with technical success and low complication rates, at par with accepted international standards.

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