COMPLICATIONS OF ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY IN KURDISTAN CENTER FOR GASTROENTEROLOGY AND HEPATOLOGY

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ABSTRACT

Background

ERCP has become widely available for the diagnosis and treatment of benign and malignant pancreaticobiliary diseases.In this retrospective study, the overall complications rates for therapeutic ERCP were identified in Kurdistan Center for Gastroenterology and Hepatology-Sulaimani-Kurdistan region-Iraq.

Patients and Methods

This retrospective case series was carried out in Kurdistan center for gastroenterology and hepatology in Sulaimani city-Iraq from January 2014 to January 2015. The records of 806 ERCP were evaluated to collect procedure related data and the overall complications rate for diagnostic and therapeutic ERCP.

Results

All cases examined by ERCP in the KCGH in Sulaimani over a period of one year (from January 2014 to January 2015) were 806, 471 females (58.43%) and 335 males (41.56%). Less than quarter of patients were referrals from Iraqi governorates other than Sulaimani governorate. The mean duration of ERCP procedure was 27.5 min. Deep cannulation was successful in 749 (92.92%) patients. There were 57 (7.07%) failure of cannulation. In cases who had successful cannulation a cholangiogram was obtained which showed bile duct dilatation. In cases of failed cannulation pancreatic stent deployed in 26 (3.22%). Endoscopic sphincterotomy was performed in 472 (58.56%) patients, followed by stone extraction in 341 (96.05%) patients ,stenting of common bile duct in 422 (52.35%) ,stent removal in second session of ERCP. The overall complications rate was 9.42%. Post-ERCP pancreatitis was the most common and occurs in 34 patients (4.23%), Bleeding occurred in 19 patients (2.35%) and was related to a therapeutic procedure in all cases. Sixteen patients had cholangitis (1.98%), most cases being secondary to incomplete drainage. There were 4 perforations (0.49%). All other complications totaled 1.12%.

Conclusion

Despite the potential benefits of ERCP for the treatment of benign and malignant pancreaticobiliary diseases, it is associated with morbidity and risk of mortality. The most frequent ERCP-related complication was pancreatitis. Bleeding was second complication and mostly associated with sphincterotomy. Other complications such as cholangitis and perforation were rare. Patients' comorbidities and therapeutic procedures can increase the risk of post-ERCP complications.Our interventions and their complications rates are comparable to those reported in other countries

Keywords: *ERCP, KCGH Sulaimani, Endoscopic sphincterotomy, Pancreatitis, Duodenal perforation, Duodenal haemorrhage*

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INTRODUCTION

Endoscopy of the gastrointestinal tract became practical in the late 1960s, when flexible fiberoptic endoscopes became available [1, 2]. Diagnostic and therapeutic endoscopic retrograde cholangiopancreatography (ERCP) has been performed for approximately 30 years and has less morbidity than surgery [3]. Despite the potential benefits of ERCP for the treatment of benign and malignant pancreaticobiliary diseases, it is associated with morbidity and risk of mortality [5, 6]. Applications of therapeutic ERCP include sphincterotomy, removal of common bile duct stones, lithotripsy, biliary drainage, stent insertion, "sweep" of the common bile and pancreatic ducts and stricture dilation [6].

Despite the potential benefits of ERCP, the technique is very operator dependent and patients are at risk for developing complications [3, 7]. Complication rates are lower with increased experience of the endoscopist [7–9]. The complications can be secondary to biliary and pancreatic manipulation or related to endoscopy [3, 7]. The approximated rate of significant complications after sphincterotomy at 10% [8]. In the past decade, definitions have been developed for classifying the severity and timing of complications [10]. A specific grading system for the major complications such as pancreatitis, perforation, and bleeding has also been proposed [8]. As regards timing, complications are considered immediate if they occur during or shortly after the procedure, or early if they occur within a few hours, and delayed if they occur within 30 days [7]. Also complications are classified as mild if stay in hospital less than 3 nights; or moderate if hospital stay is between 4 and 10 nights; and severe if the patient is hospitalized for 10 or more nights, admitted to an intensive care unit, or requires surgery [7]. In clinical practice, diagnostic procedures are performed less commonly than therapeutic ones. Pancreatitis was the most common adverse event in both groups [13]. Cholangitis, hemorrhage, and duodenal perforation were the next most common in the group who underwent a therapeutic procedure.

In this article, we illustrate the ERCP-induced complications with an emphasis on the more common ones. First, we present an overview of the ERCP techniques and interventions. We then discuss specific complications of ERCP, which include pancreatitis, duodenal perforation, duodenal hemorrhage, infection, stent migration, and complications secondary to endoscopy. More care and action is performed if patients have severe abdominal pain, elevated white blood cell count, and fever after ERCP. Once the type of complication is diagnosed, the patient can be monitored for development of further complications with additional investigations as indicated [19].

PATIENTS AND METHODS

This is a retrospective case series study was conducted at KCGH in Sulaimani city – Iraq from January 2014 to January 2015. The records of 806 ERCP procedures were retrospectively evaluated to collect the procedure related data which include indication for ERCP, duration of the procedure, cannulation successful rate, therapeutic interventions performed and ERCP related morbidity and mortality.

Before the procedures, patients were interviewed and their complaints were recorded mainly pain, jaundice, fever, abdominal distension or leakage from the drain or the wound. All details of previous surgery, pervious ERCP procedure, any post ERCP complications and time interval between any biliary surgery and symptoms. The initial diagnostic work up included liver biochemical tests and trans-abdominal ultrasound. Selected cases underwent computed tomography (CT) scan, endoscopic ultrasound (EUS) and / or magnetic resonance cholangiopancreatography (MRCP) as dictated by the clinical presentation and the results of the initial work up.

A written informed consent was obtained. A minimum fasting period of 6-8 hours was necessary. The procedures were performed under conscious sedation using intravenous midazolam and pethidine with doses escalated according to response. Pulse oximetry was used for intra-procedural monitoring. All the procedures were performed by experienced gastroenterologists.

A basic cholangiogram was obtained to determine the nature and site of the abnormality and then therapeutic interventions were performed accordingly.

After the ERCP, patients were observed in KCGH for 4-6 hours and then discharged with instructions to call or return back to the KCGH if any problem occurred. Those with suspected post-ERCP complications were admitted to the hospital for further management.

RESULTS

All cases who examined by ERCP in the KCGH in Sulaimani over a period of one year (from January 2014 to January 2015) were 806. 471 females (58.43%) and 335 males (41.56%).

Less than quarter of patients were referrals from Iraqi governorates other than Sulaimani governorate.

Of 806 ERCPs performed, 347 (43.05%) were diagnostic and 459 (56.94%) were therapeutic.

The mean duration of the ERCP procedure was 27.5 min. Deep cannulation was successful in 749 (92.92%) patients. There were 57 (7.07%) failure of cannulation. In cases that had successful cannulation a cholangiogram was obtained which showed bile duct dilatation. In cases of failed cannulation pancreatic stent deployed in 26 (3.22%).

Endoscopic sphincterotomy was performed in 472 (58.56%) patients, followed by stone extraction in 341 (96.05%) patients, stenting in 422 (52.35%), These stents were removed by second session of ERCP after a period ranging from 1 to 6 months according to the patients stability and freedom of symptoms.

In seven cases during the second session to remove the stent we found that the plastic stents were slipped inside the CBD, in five cases succeeded to remove these stents, but in two patients failed to remove them.

Cases with sever cholangitis and slugs with inadequate drainage nasobiliary tube were put in (3 cases) and instruction given for irrigation with normal saline every hour until the acute condition of the patient is stable.

In this study the overall complications rate was 10.42%. Post-ERCP pancreatitis was the most common and occurs in 34 patients (4.23%) and in 85% of cases was self-limiting, requiring only conservative treatment. Bleeding occurred in 19 patients (2.35%) different from mild in 17 patients to severe in two cases that needs blood transfusion and all cases were related to a therapeutic procedure. 16 patients had cholangitis (1.98%)develop, most cases being secondary to incomplete drainage. In 3 cases nasobiliary tube were put in with irrigation by normal saline.

There were four perforations (0.49%). All other complications were 1.12%. Variables derived from cannulation technique associated with an increased risk for post-ERCP pancreatitis were multiple cannulation attempts, sphincterotomy, pancreatic duct manipulation, multiple pancreatic injections, and guidewire use to achieve cannulation. Patient characteristics associated with an increased risk of pancreatitis were, previous ERCP-related pancreatitis, and recurrent pancreatitis.

Table 1. Therapeutic endoscopic interventions applied during ERCP, (N=806).

Intervention	Number	Percentage
Successful cannulation	749	92.92%
Failure cannulation	57	7.07%
Endoscopic sphincterotomy	472	58.56%
Stone extraction	341	96.05%
CBD stenting	422	52.35%
Pancreatic stent deployed	26	3.22%
Pancreatic and CBD stent removal	432	53.59%
Stent slipped into CBD and removed	5	0.62%
Stent slipped into CBD and not removed	2	0.24%
Nasobiliary tube	3	0.37%

Table 2. Complications of ERCP (N=806).

Complications	Number	Percentage
Pancreatitis	34	4.23
Bleeding	19	2.35
Cholangitis	16	1.98
Perforation	4	0.49
Other	9	1.12
Death	2	0.24
Total	84	10.42

DISCUSSION

There were many studies of the rate of complications of ERCP procedures the range is 5.6- 9.8 % [12, 13]. This rate variability in the literatures could be due to the differences in patient population, study methods, and physician experience [13].

Intravenous sedation increases the risk of cardiopulmonary complications [14], while sphincterotomy will increase the risk of duodenal, ductal perforation, hemorrhage and acute pancreatitis [15] .

Acute pancreatitis occurs in approximately 5-10% of procedures [15]. A commonly used definition of post-ERCP pancreatitis is abdominal pain for more than 24 hours after the procedure and levels of serum pancreatic enzymes three times above normal This definition excludes the 30%–75% of patients who are asymptomatic and have an elevated amylase level alone [16]. Asymptomatic hyperamylasemia peaks 90 minutes to 4 hours after ERCP and resolves within 48 hours [17] . Risk factors for post-ERCP pancreatitis are sphincter of Oddi dysfunction and young age [18] ,increased manipulation around the papilla and multiple injections of the pancreatic duct [19]. The pancreatitis is mild or moderate in 90% of cases [3, 20].

In this study pancreatography is avoided as much as possible and only done in indicated cases. In the failure of cannulation or in high risk patients pancreatic duct stent diploid to decrease the risk of pancreatitis which appear as 34 (4.23%) which is low in comparison to other studies.

Perforation of the duodenum or distal duct occurs in 1.3% of cases, usually with sphincterotomy [21]. Risk factors include a deep incision outside the papilla, precut papillotomy, guide-wire perforation, non dilated ducts, sphincter of Oddi disease, and Billroth II surgery [11, 22]. Free retroperitoneal air has been seen in 29% of asymptomatic patients on a CT scan obtained within 24 hours of the procedure [23] . However, infection of bile and leakage of fluid through the perforation in cases of failed biliary drainage correlate with increased morbidity [24]. In cases of medical treatment failures, there is a high mortality rate of 50% due to sepsis [25].

In the literatures, four separate types of perforation .In the first type only retroperitoneal air, The other 3 are distal ductal perforation by a guide wire, periampullary duodenal perforation, and duodenal perforation remote from the ampulla by the endoscope, [25, 26].

In this study there were 4 (0.49%) perforations, all of them were first or second type with extravasation of dye seen during the procedures and treated conservatively.

Hemorrhage from ERCP usually occurs with sphincterotomy. Patients with coagulopathy and vascular anatomic variants are at increased risk [11, 27]. The overall prevalence is between 2.5% and 5% [21,28]. The hemorrhage can be immediate but is delayed in most cases and is arterial or venous [18, 21 ,29]. Delayed bleeding occurs 24 or more hours after the procedure due to sloughing of the coagulum or restarting anticoagulation [30]. Freeman et al [9, 31] defined significant hemorrhage as clinical evidence of bleeding with malena or hematemesis with an associated decrease in hemoglobin concentration of at least 2 g/dL or need for a blood transfusion. Delayed hemorrhage is treated with repeat endoscopy and epinephrine injection, embolization, or surgery [11, 21, 32].

With total 472 sphinecterotomies, only 19 (2.35%) patients had bleeding,17 patients were minor bleeding that responded to local measures in the form of balloon compression, adrenaline spray and thermal therapy, one patient needs blood transfusions, unfortunately

one patient with pancreatic head mass died because of severe bleeding in spite of resuscitation.

Although bacteremia is common, occurring in 15% of diagnostic and 27% of therapeutic procedures, there appears to be no significant clinical consequence from bacteremia alone [3 ,9, 33]. Cholangiovenous reflux of bacteria after ERCP depends on pressures in the biliary tree [11, 34]. Infection after ERCP usually occurs in patients who have obstructed ducts that are not adequately drained by the procedure [11, 34]. In a literature cholangitis was reported in 1% [9, 35]. Sepsis is the most common cause of death associated with ERCP [11,36].

Cholangitis in our study was 1.98%, but one patient 81 years old with much comorbidities died of septicemia.

Those 2 (0.24%) patients died in our study had a protracted post-operative course with bleeding, sepsis and multi-organ system failure that culminated in death. The mortality rates in other studies were in the range of 2-12.5% [11, 36].

Migration of a common bile duct or pancreatic duct stent occurs in up to 5.9% of cases [11, 36]. Migration can occur into the proximal duct or into the gut. Risk factors associated with proximal stent migration are malignant strictures, large stent diameter, and short stent length [11, 37]. Distally migrating stents are usually expelled with stool, whereas proximally migrating stents are removed endoscopically.

We have 7 cases (0.86%) with slipped stent into CBD, succeeded to remove 5 of them.

Other complications of ERCP are those related to endoscopy and include esophageal, liver, and splenic injury. 75% of esophageal perforations in adults occurs during endoscopy [38]. At CT, pneumomediastinum, mediastinitis, and extravasation of contrast material can be seen. Pleural effusion and pneumothorax can also develop within 12–24 hours [38].

In conclusion, the most frequent ERCP-related complication was pancreatitis, which was mild in the majority of patients. Bleeding was rare and mostly associated with sphincterotomy. Other complications such as cholangitis and perforation were rare. Patient comorbidities and therapeutic procedures can increase the risk of post-ERCP complications.Our interventions and their complications rates are comparable to those reported in other countries

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