

# Complications due to Endoscopic Retrograde Cholangiopancreatography : A Mini Review of Risk Factors and Diagnosis

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**Abstract:** Endoscopic retrograde cholangiopancreatography (ERCP) is a diagnostic and therapeutic procedure performed for pancreatobiliary diseases. Procedure has many complications and most frequent is pancreatitis. Knowing the risks of the pancreatitis due to ERCP can reduce the rate of the complication and can affect its consequences. Many studies are performed for describing the risk factors of the procedure and the results are divided in two categories; patient related and endoscopy related. Patient related factors are female sex, young age, sphincter of oddi dysfunction, intraductal papillary mucinous neoplasm and previous pancreatitis, endoscopy related factors are unexperienced center, multiple cannulation, precut sphincterotomy, difficult cannulation, deep wire pancreatic cannulation and pancreatic or main duct contrast injection. Foreseeing the risk of the patient can reduce the complication rate of the endoscopist by selection of patients for new performers or taking precautions for the experienced ones.

**Key words:** ERCP, pancreatitis, risk factor.

## 1. Introduction

ERCP (endoscopic retrograde cholangio pancreatography) is the preferred diagnostic and therapeutic procedure for many pancreatobiliary benign and malign diseases since its description in 1968. Many studies have been performed for ERCP complications and complication rates described in wide spectrum from 2% to 40% [1-3].

## 2. Risk Factors

Knowing the complications and their frequency is essential for the quality of procedure safety of patient and can affect complications consequences. Studies

describe far different complication rates due to study protocols, patient selection, patient follow up, study sample size and experience of the center. Although it is impossible to completely avoid complications, identifying risk factors is the first step for minimizing them. Risk factors are divided into two categories: patient related factors and procedure related factors. Every complication can be minimized by understanding the risk factors and taking specific precautions.

Most frequent known ERCP welded complication is pancreatitis and ranges 1.3% to 7.6% in prospective series studied in high volume centers. A meta-analysis study of 15 studies which contains 10.997 patients performed in 2003 for acute pancreatitis due to ERCP shows that patient related factors were suspected oddi sphincter dysfunction, female gender and previous

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pancreatitis likewise performing precut sphincterotomy and pancreatic contrast injection were endoscopy related factors [4, 5].

Another meta-analytic study performed in 2015 which analyzed 28 studies contains 54,889 patients came with nearly the same results with additional risks. Patient related factors were female gender, previous pancreatitis, Sphincter of oddi dysfunction (SOD) and Intraductal papillary mucinous neoplasm (IPMN). Endoscopy related factors were difficult cannulation, performing sphincterotomy, performing precut sphincterotomy and main duct contrast injection [6].

Additionally, a prospective multicenter study performed in 14 centers which contains 3,178 patients designed for risk factors for all the complications of ERCP performed in 2006 has a rate of 1.6% for pancreatitis. In this study patient related factors were female gender and young age (< 60). Endoscopy related factors were  $\geq 1$  pancreatic deep wire pass and needle-knife precut sphincterotomy [7].

An interesting prospective multicenter study performed in 2010 which connects experienced (11 center) and unexperienced (10 center) centers contains 3,635 procedures. In this study unexperienced centers had a higher rate of pancreatitis compared to the experienced ones but it was not statistically significant. In studies most significant result was: although precut sfincterotomy is a risk factor in this study and other studies, multipl cannulation has higher risk for pancreatitis compared to precut sfincterotomy. Sacrificing precut sphincterotomy to trying cannulation for more than 10 minutes or multipl cannulation is a greater risk for pancreatitis [8].

A multi-center study performed at 66 centers in 2006 consists of 5,264 ERCP procedures amongst 4,561 patients has a complication rate of 5% and pancreatitis rate of 1.6%. Patient related factors were female sex and young age. Endoscopy related factor was performing in unexperienced center [3].

Among studies about the risk factors for the pancreatitis due to ERCP; most frequent and proven

patient related factors are female sex, young age, SOD, IPMN and previous pancreatitis, endoscopy related factors are unexperienced center, multiple cannulation, precut sphincterotomy, difficult cannulation, deep wire pancreatic cannulation and pancreatic or main duct contrast injection.

### **3. Conclusions**

Complication due to ERCP is an unavoidable fact for ERCP performing endoscopist and pancreatitis is the most common of all. Knowing the risks is key for minimizing the risks and a start for safer ERCP. When these stated risk factors presented before or occurred during ERCP some precautions can be planned. These precautions can be pharmacological agents like antibiotics and/or nonsteroidal anti-inflammatory drugs, stopping of oral intake and for some cases same day discharges can be postponed for the selected cases for benefits of the patient. Performing these precautions can lighten the pancreatitis or can help avoid them. Also, unexperienced or beginner endoscopists can foresee the risk and avoid it by referring the potential patient to an experienced center.

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