

# Biliary Obstruction: Evaluation With Direct Cholangiography

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## Abstract

**Objectives:** To find out the accuracy of direct cholangiography in evaluation of etiology of biliary obstruction.

**Materials and Methods:** Sixty consecutive patients aged 26-86 years (mean 58 years) with suspected biliary obstruction underwent direct cholangiographic evaluation (Percutaneous Transhepatic Cholangiography / Endoscopic Retrograde Cholangiography). The likely causes were divided into malignant and benign. Most likely cause on the basis of cholangiographic findings were recorded. Diagnoses were confirmed either at surgery or histopathologically (USG-guided FNAC or ERC-biopsy).

**Results:** Direct Cholangiography (PTC/ERC) accurately identified the malignant biliary obstruction in 98% and benign in 93% of the cases. Findings were found to be statistically significant ( $p < 0.05$  at 95% confidence interval).

**Conclusion:** This study shows high accuracy of direct cholangiography in identification of the cause of biliary obstruction. It should be considered as the complementary radiological modality when surgery or percutaneous interventions e.g. biopsy, tube drainage or biliary stenting are planned.

## INTRODUCTION

Jaundice may be obstructive (surgical) or non-obstructive (medical). The basic distinction can usually be made on the basis of the history, physical examination and liver function tests (LFTS).<sup>1</sup>

The aim of radiological investigations in obstructive jaundice is to provide the diagnostic information including the level and cause of obstruction.<sup>2</sup> Since the identification of cause of biliary obstruction is very important before planning any therapeutic intervention we present a prospective study to identify the most likely etiology of biliary obstruction by using direct cholangiography which can well be followed by radiological interventions like Percutaneous transhepatic cholangiodrainage (PTCD) or biliary stenting. It has been shown that noninvasive investigations like Ultrasonography and minimally invasive procedures like CT Scan are very sensitive modalities in the diagnosis of biliary obstruction, however, their validity is not as high as direct cholangiography. Apart from that, direct cholangiography can well be followed by interventions for biliary drainage in those patients where surgery is either not possible or has to be delayed till the liver function tests are

normal. Magnetic resonance cholangiography is a good alternative to direct cholangiography however because of high cost and lack of therapeutic role it is yet to be considered as an important modality in the developing countries. In some of the studies it has been shown that Transhepatic cholangiography is 100% successful in establishing both the cause and site of biliary obstruction without significant complications.<sup>3</sup>

Likewise the drainage procedure which is followed by the percutaneous transhepatic cholangiography (Fig. 1.) can reduce the surgical complication rate from 44% to 15%.<sup>4</sup>

**Figure 1**

Figure 1: Percutaneous transhepatic cholangiography. Hilar cholangiocarcinoma.



**MATERIALS AND METHODS**

It was a prospective non-randomized study conducted in the department of radiology and Imaging, Tribhuvan University, Teaching Hospital, Maharajgunj, Kathmandu, Nepal from August 2003 to November 2004. Patients with obstructive jaundice were referred to the radiology department for direct cholangiography (45 underwent PTC and 15 ERCP).

The most likely causes of obstruction were recorded as malignant or benign. Abnormal intraluminal protruding lesions, irregular narrowing of the bile ducts or abrupt tapering of the extra hepatic bile duct were the criteria for malignancy however smooth narrowing or any smooth filling defect typical of benign pathology e.g. crescent sign in choledocholithiasis were regarded as benign pathology. In all cases the diagnoses were biopsy proven at surgery, by percutaneous needle biopsy or ERC-Biopsy.

Statistical analysis was performed by using Epi info 6.0 software programme.

**RESULTS**

A total of 60 patients with obstructive jaundice were evaluated. There were 35 (58%) females and 25 (42%) males. The age group ranges from 20-90 years with largest group in 50-59 years (44%).

Direct cholangiography correctly identified 44 cases of malignant biliary obstruction with a sensitivity of 98% and accuracy of 97% (p<0.001). Likewise the sensitivity of direct cholangiography in identification of benign causes was 93% with the accuracy of 93 % (p<0.001), (table 1).

**Figure 2**

Table 1: Summary of validity of direct cholangiography (DC) in evaluation of cause of obstructive jaundice

CAUSE	SEN.	SPEC.	ACC.	PPV	NPV	P-VALUE
Malignant	98%	93%	97%	98%	93%	<0.001
Benign	93%	93%	93%	83%	97%	<0.001

**DISCUSSION**

Evaluation of patients with bile duct obstruction frequently involves the stepwise performance of several imaging techniques. The aim of these investigations is to provide sufficient diagnostic and anatomic information to allow appropriate treatment. Such information includes the level and cause of biliary obstruction in addition to assessment of tumor resectability in malignant cases.<sup>5</sup>

The purpose of this study was to evaluate causes of biliary obstruction in patients with obstructive jaundice by direct cholangiography. Several pathways have been suggested for these patients. <sup>6</sup>

The Majority of the patients in our study (75%) had a malignant cause. Only 15 patients (25%) had benign etiology. Among the malignant causes, periampullary carcinoma (Fig. 2.) was the most common cause followed by carcinoma of gall bladder, carcinoma of head of pancreas and cholangiocarcinoma involving the proximal common bile duct (CBD) and hilum. Likewise choledocholithiasis was the most common cause of benign obstruction followed by post operative stricture and choledochal cysts respectively.

**Figure 3**

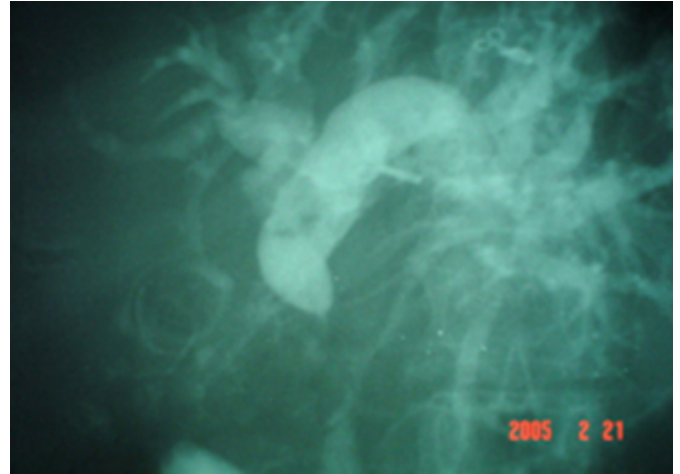
Figure 2: Percutaneous transhepatic cholangiography. (PTC) Periampullary growth.



Direct cholangiography correctly identified 44 cases of malignant biliary obstruction out of 45 (98%), the case that direct cholangiography missed was a case of ampullary carcinoma. As the patient also had concurrent multiple cholelithiasis, the intraluminal filling defect seen in the distal common bile duct (CBD) was interpreted as crescent sign of choledocholithiasis (only PTC was performed in this case) but it was found to be intraluminal ampullary growth at surgery which was confirmed as adenocarcinoma in histopathology. Another case which was wrongly interpreted as malignant stricture of common bile duct (CBD) was later found to be mirrizi syndrome (Fig. 3.). PTC revealed irregular narrowing of mid common bile duct (CBD) (interpreted as cholangiocarcinoma) however USG and later on CT scan revealed multiple gall bladder calculi with erosion and obstruction of mid common bile duct (CBD). It was confirmed at surgery. As we know, benign strictures may occasionally mimic malignant lesions.<sup>7</sup>

**Figure 4**

Figure 3: Percutaneous transhepatic cholangiography. (PTC)-Mid CBD stricture in a patient with large calculus in Hartmann's Pouch (Mirrizi syndrome). CBD – Common bile duct



Di Cesare E et al, in their study comparing the Magnetic Resonance Cholangiopancreatography (MRCP) and Endoscopic retrograde cholangiopancreatography (ERCP) in malignant obstructive jaundice, found that ERCP allowed detection of the presence of site of biliary stenosis in 20/21 (95%) cases.<sup>8</sup>

The better result of our study could be because of the larger study group in our study and that the majority of our patients had undergone percutaneous transhepatic cholangiography (PTC), unlike their study we had included all the cases of biliary obstruction and not only the distal ones

## CONCLUSION

On the basis of our study result, we conclude that invasive procedures like percutaneous transhepatic cholangiography (PTC) or endoscopic retrograde cholangiography (ERC) may be considered in evaluation of cause of biliary obstruction in patients with obstructive jaundice especially when interventions like tube drainage, stenting, calculus removal or biopsy are planned for.

## CORRESPONDENCE TO

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