FINDINGS AND EVALUATIONS OF CHOLANGIOGRAPHY IN PERCUTANEOUS TRANS HEPATIC BILIARY DRAINAGE PATIENTS IN SIRIRAJ HOSPITAL

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ABSTRACT

Sixtyseven cholangiographic findings in the films, with clinical histories and investigations of 119 patients in Siriraj Hospital were reviewed by two radiologists. Classifications of causes of obstructive jaundice were devided depending on the anatomical locations and morphologies. Proximal extrahepatic duct obstruction was the most common location (41.8%) and focal stenotic type was mostly founded in the morphologic picture (86.5%). The most founded diagnosis in 119 patients was cholangiocarcinoma (54.6%). There were 61.3% male and 38.7% female patients, with average age of 58.43% years, most of them came with jaundice (99.2%). The total bilirubin was higher than 10 mg./dl. In about 90%, and the CA19-9 level was higher than 100 U/ml. in about 80%. Comparisons with other previous studies were performed.

INTRODUCTION

One of the rare cancer is primary malignancy of biliary ductal system, less than 1% of all malignancies. There were about 4,500 new cases of cholangiocarcinoma reported yearly, in the Unites States,[1] which cholangiocarcinoma is about one third, as common as cancer of the gall bladder.

Despite newer imaging modalities, the diagnosis of cholangiocarcinoma remains difficult. Due to the late appearances of the symptoms, bile duct cancer remains a higher lethal neoplasm, even with early diagnosis. The overall 5 years survival rate from the time of diagnosis is 1%, with the medial duration until death is about 7 months. For the patients who have received curative resection, the 5 year survival rate increases only 15% to 20%.[4,7]

The radiologist is taking a more active role in the diagnosis and managements of patients with obstructive jaundice, such as, cholangiocarcinoma. The decisions on proper managements require reliable and valid clinical judgements and a knowledge of the natural history of bile duct diseases.

The method of Interventional Radiology for percutaneous external drainage of the bile from the dilated bile ducts is called Percutaneous Transhepatic Biliary Drainage (P.T.B.D.). This is the palliative treatment for obstructive jaundice patients, including inoperable cases of malgnancy (such as, cholangiocarcinoma), obstructive ascending cholangitis, or for further treatments.

To evaluate the causes and managements of obstructive jaundice patients, the relationships between anatomic locations and morphologic types of cholangiograms are useful.

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In 1979, there was the first radiological reported case of P.T.B.D., by Watcharasin, R. et al.[14] In 1980, the adaptation for simple procedures of P.T.B.D. was reported by Vaeusorn, N.[12], and on 20th, October, 1980, the first P.T.B.D. case, using SRL catheter (Siriraj loop catheter, Self retaining loop) was performed in the Department of Radiology, in Siriraj Hospital.

PURPOSES

1. To evaluate the P.T.B.D. patients in Siriraj Hospital about :
   - Age and Sex
   - Clinical histories
   - Laboratory investigations
   - Diagnosis of P.T.B.D. patients
2. To classify the relationships between anatomic locations and morphologic types of obstructive jaundice in the P.T.B.D. patients
3. To compare the point of obstruction of P.T.B.D. patients with other studies
4. To present other Interventional Radiological procedures via P.T.B.D., such as, foreign body extraction

MATERIALS AND METHODS

The cholangiographic films and reports from Vascular and Interventional Radiological unit in the Department of Radiology, Siriraj Hospital, were reviewed by two radiologists, There were 119 cases of P.T.B.D. patients which were performed between February 1993 and June 1999, but we can search and collect the cholangiograms for revision about 67 cases. In all cases, the diagnosis was proved by the clinical, surgical and pathological reports on each patient. The revised P.T.B.D. patients were excluded from the study.

Five categories of the details findings were grouped into :

1. Age and Sex
2. Clinical histories
3. Laboratory investigations
4. Diagnosis of P.T.B.D. patients
5. Relationships between anatomic locations and morphological types.

Each cholangiogram was classified into one of four anatomic locations and one of four morphologic types.

Four anatomic locations were defined as: (Figure 1.)

1. The intrahepatic duct location:
   - Those biliary radicles proximal to the main right and left hepatic ducts
2. The proximal extrahepatic duct location:
   - Those biliary radicles at the main right and left hepatic ducts and the common hepatic duct 1 cm. distal to hepatic duct bifurcation
3. The middle extrahepatic duct location:
   - At the extrahepatic duct located within the hepatoduodenal ligament
4. The distal hepatic duct location:
   - At the intrapancreatic part of the extrahepatic duct.

Some tumors across more than one defined ductal segment, in such cases, the proximal limit of extent was used in defining the anatomical location. This was done because the proximal limits of extent of a bile duct disease is a critical determinant of resectability and therefore the prognosis.

Three cholangiographic morphologic types were defined as:

1. Focal stenotic lesion:
   - A tapered lesion 1-3 cms. long that narrowed or obstructed a segment of bile duct,(Figure 2)
2. Polypoid lesion:
   - Intraluminal, papillary protruding lesion.(Figure 3)
3. Diffuse sclerosing lesion:
   - Lesions that narrowed or obstructed multiple segments of bile ducts. (Figure 4)

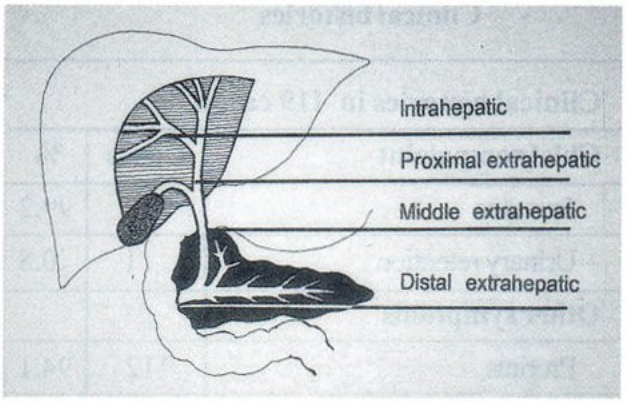


Fig.1 4 anatomic location of bile ducts in retation to liver, gall bladder, duodenum, and pancreas.

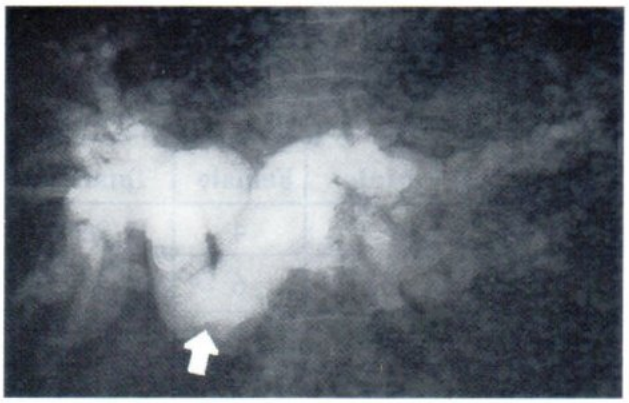


Fig.2 Transhepatic cholangiography shows obstruction of contrast medium at confluence of right and left dilated intrahepatic ducts.*(arrow)* **(Focal stenotic lesion of cholangiocarcinoma)**

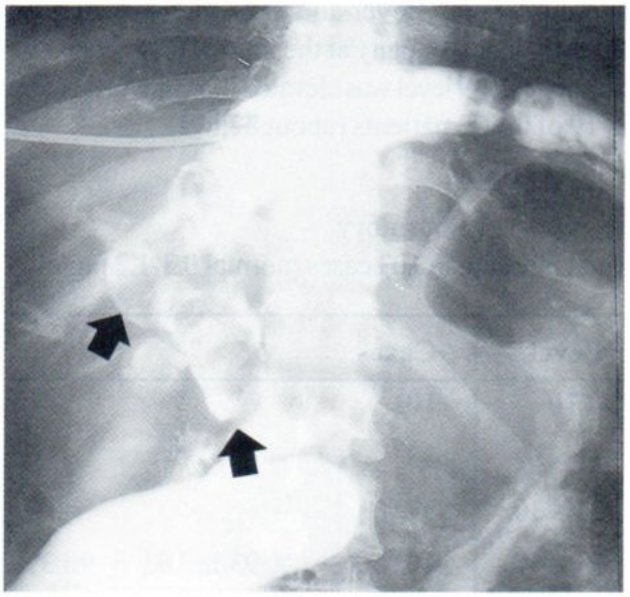


Fig.3 Transhepatic cholangiogram. Multiple polypoid contrast filling defects in main right hepatic duct *(upper arrow)* and proximal common hepatic duct.(lower arrow). **(Polypoid lesions of cholangiocarcinoma)**

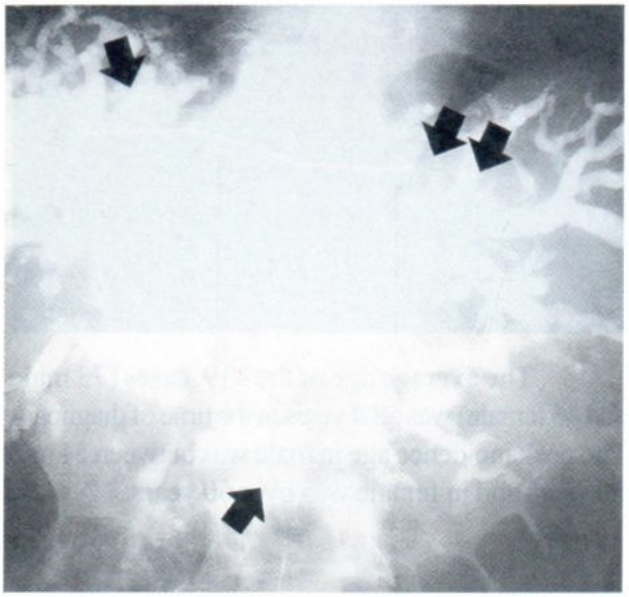
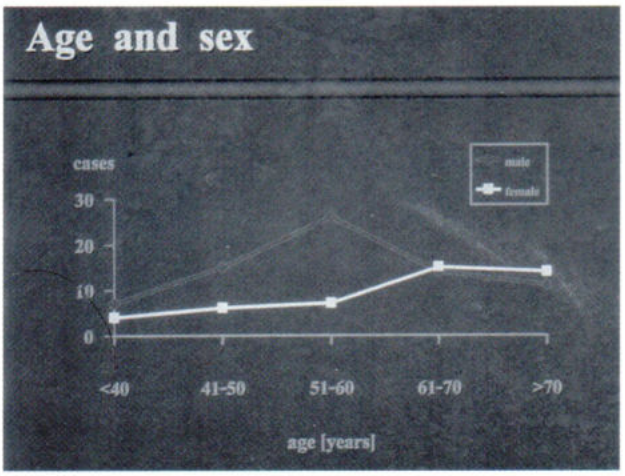


Fig.4 Transhepatic cholangiogram. Diffuse dilatations of right *(arrow)*, left *(double arrow)* intrahepatic ducts and common hepatic duct (*lowest arrow*). **(Diffuse sclerosing lesion of cholangiocarcinoma)**

RESULTS

- Age and Sex

Age (years)	Male	Female	Total
< 40	7	4	11(9.3%)
41-50	15	6	21(17.6%)
51-60	26	7	33(27.7%)
61-70	14	15	29(24.4%)
> 70	11	14	25(21.0%)
Total	73 (61.3%)	46 (38.7%)	119 (100.0%)



The average age of the 119 cases (73 male and 46 female) was 58.4 years at the time of diagnosis. The peak incidence age in male was between 51 and 60 years and in female was over 60 years.

- Clinical histories

Clinical histories in 119 cases.		
Chief compalaint	**Cases**	**%**
Jaundice	118	99.2
Urinary retention	1	0.8
Other symptoms		
Pruritus	112	94.1
Fever	29	24.4
Abdominal pain, discomfort	53	44.5
Palpable mass	2	1.6

Painless jaundice with elevated liver function test (such as total bilirubin higher than 10 mg/dl in 90.3%) was the usual presenting clinical and laboratory features of cholangiocarcinoma. Pruritus, non specific abdominal pain, fever and palpable mass may be frequently accompany at the time of diagnosis. The serum CA19-9 level was elevated more than 100 U/ml in 19 of the 23 patients (about 82.6%)

- Laboratory

Total bilirubin in 103 cases (normal 0.3-1.2 mg/dl)

Level	Cases	
< 10	10	
11 - 20	33	= 93 in 103 = 90.3%
21 - 30	37	
31 - 40	16	
41 - 50	4	
> 50	3	

CA 19-9 in 23 case (normal 0 - 35.6 U/ml)

Level	Case	
0-35.6	3	
35.7-99	1	
100-999	7	= 19 in 23 = 82.6%
1,000-9,999	5	
10,000-99,999	5	
> 100,000	2	

- **Diagnosis in PTBD patients (from the final diagnosis in the reports)**

Cholangiocarcinoma	65
Hepatoma	9
CA head of pancreas	14
- With liver metastasis	1
CA gallbladder	7
- With liver metastasis	1
Cholangitis	4
Gallstones	3
Post-operative stricture	3
Chronic cholecystitis	1
Biloma	1
Pancreatic pseudocyst	1
Obstructive jaundice	9
: associated with	
- CA stomach, antrum	2
- CA duodenum	1
- CA colon	2
- CA lung	1
- Lymphadenopathy at porta hepatis	1
Total	**119 cases**

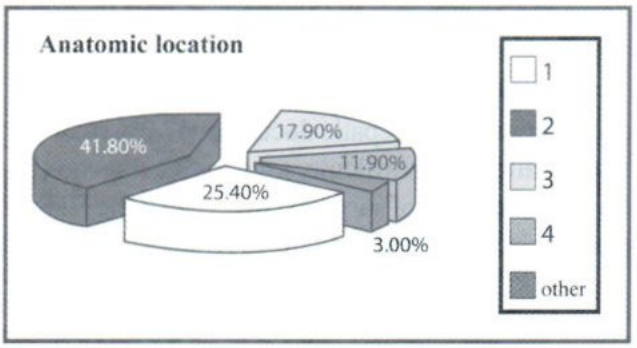
- **Relationship between anatomic location and morphologic types.**

Anatomic locations	Morphologic types			Total	
	I	II	III		
1	16	-	1	17	(25.4%)
2	25	-	3	28	(41.8%)
3	11	1	-	12	(17.9%)
4	6	2	-	8	(11.9%)
Total	58 (86.5%)	3 (4.5%)	4 (6.0%)	65	(97%)

Other 2 cases (3%)

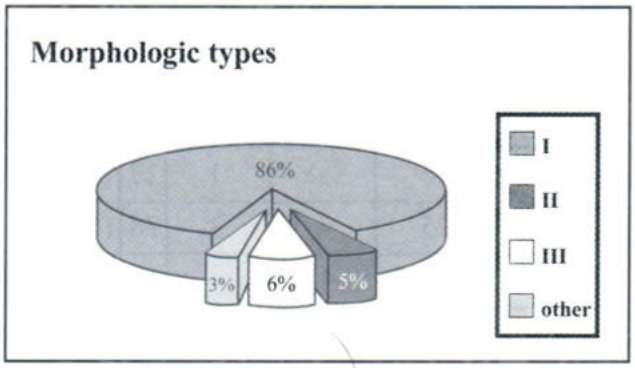
1 case anatomic location was defined as 3, morphologic types were defined as I and III 1 case was defined as choledochal cyst.

Anatomic locations



1 = Intrahepatic duct,
2 = Proximal extrahepatic duct
3 = Middle extrahepatic duct,
4 = Distal hepatic duct

Morphologic types



DISCUSSION

In our series of cholangiograms, the most common anatomic location that caused obstructive jaundice was the proximal extrahepatic ducts (28/65 = 41.8%), the same as other reports. The comparison with the reports by Nichols et al.9 (40/82 = 48.78%) and in Siriraj Hospital from Oct. 1980-July 1984 (43/95 = 45.26%) is in the table below :-

	NICHOLS et al 1983	SIRIRAJ I (Oct. 1980 - July 1984)	SIRIRAJ II (Feb 1993 - June 1999)
Intrahepatic	35.37 (29)	24.21 (23)	25.4 (17)
Proximal extrahepatic	48.78 (40)	45.26 (43)	41.8 (28)
Middle extrahepatic	12.19 (10)	20.00 (19)	17.9 (12)
Distal extrahepatic	3.66 (3)	10.53 (10)	11.9 (8)

The percentage of obstruction at intrahepatic and proximal extrahepatic ducts was 67.2% (45/65), most of all making difficulty for curative resection or lower probability of surgical cure, so that the PTBD procedures were the palliative interventional treatment.

The focal stenotic lesion was the most common morphologic type (86.5%), the same as other previous reports.[9] The average age was 58.43 years with predominant in male (61.3%), and mostly came with jaundice (99.8%), and the total bilirubin level was more than 10 mg/dl in 90.3% and cases with CA 19-9 level higher than 100 U/ml in 82.6%

There were 65 cases that proved to be cholangiocarcinoma among 119 cases, confirming that the PTBD procedures could be performed in the other diseases. There was no case of ulcerative colitis in these Asian patients, not the same as in the Caucasian patients which were well known of the association of cholangiocarcinoma and ulcerative colitis found in many previous Caucasian reports.[2,10,15]

We can make the curative treatment via the PTBD tube, the same as, in other report of extraction of the parasite (ascaris) from the intrahepatic bile duct by using the snare. (Fig. 5 and Fig. 6)

The complete and high quality cholangiograms are necessary to define the extent and morphology of cholangiocarcinoma for a determinant of resectability.

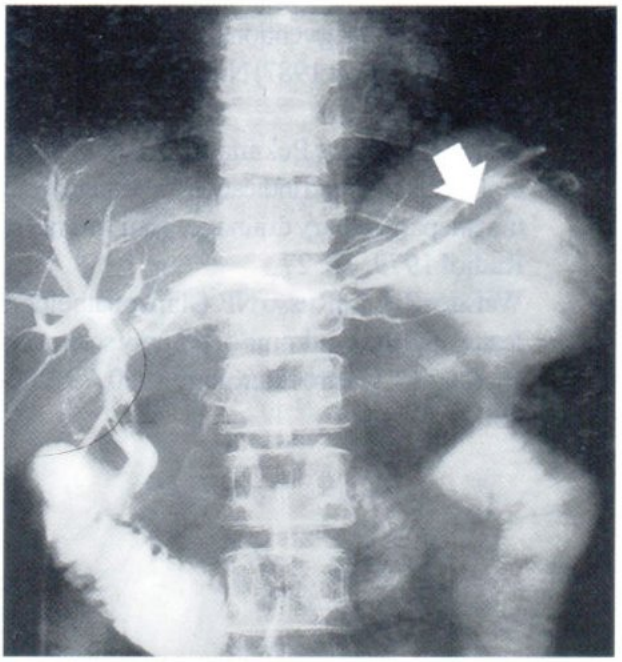


Fig. 5 Transhepatic cholangiogram showed negative tubular filling defects in the left intrahepatic duct (arrow) (proven to be ascaris after extraction)

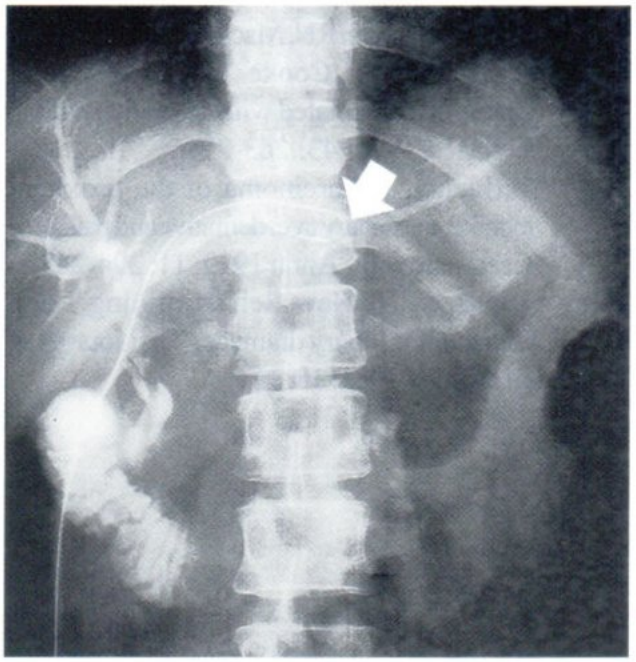


Fig. 6 Transhepatic cholangiogram shows the snare (arrow), and loss of previous negative tubular filling defect as shown in Fig.5.

Transsinus tract ascaris extraction from bile duct in the left lobe of liver was performed using the SRL catheter inserting through the T-tube by guidewire and then rotates the catheter in the same direction. The parasite that surround the catheter is slowly removed when pulling the forming loop at the tip of the catheter.

REFERENCES

1. Adson MA, Farnell MB. Hepatobiliary cancer: surgical considerations. Mayo clin proc 1981; 56: 686-699.
2. Akwai OE, van Heerden JA, Adson MA, Foulk WT, Baggenstoss AH. Bile duct carcinoma associated with ulcerative colitis. Rev Surg 1976; 33: 289-293.
3. Fraymeni JF: Cancers of the pancreas and biliary tract: epidemiological consideration, Cancer Res 1975; 35: 34-37.
4. Gibby DG, Hanks JB, Wanebo HJ et al: bile duct carcinoma : diagnosis and treatment, Ann Surg 1985; 202: 139-144.
5. Greenwold ED, Greenwold Es: Cancer epidemiology, In: New York Medical Examination Publishing 193; vol 87.
6. Iwasaki Y, Ohto M, Todorki T, Okamura T, Nishimura A, Sato H. Treatment of carcinoma of the biliary system. Surg Gynocol obstet 1977; 144: 219-224.
7. Jones RS, Handks J: Overview of cancer of bile duct. In: Wanebo HJ, ed: Hepatic and biliary cancer, New York, 1987; Marcel Dekker
8. Longmire WP Jr, McArthur MS, Bastounis EA, Hiatt J. Carcinoma of the extrahepatic biliary tract. Ann Surg 1973; 178: 333-343.
9. Nichols Douglas A. Cholangiographic evaluation of bile duct carcinoma. AJR December 1983; 141: 1291-1294

10. Ritchie JK, Allan RN, Macartney J, Thompson H, Hawley Pr, Cooke WT. Biliary tract carcinoma associated with ulcerative colitis. O J Med 1974; 43: 263-279.
11. Terblanch J. Carcinoma of the proximal extrahepatic billary tree: definitive and palliative treatment. Surg Annu 1979; 11: 294-265.
12. Vaeusorn N. New Self Reatining Loop Catheter for Filiary drainage. Thai Journal of Radiology 1981: 18: 11
13. Vaeusorn N., Interventional Radiology (Siriraj Textbook Project 1987) Number 143 (6-1987) P 122
14. Watcharasin, R., Pekanand, P, Suchato C., et al: Technique and indication for percutaneous transhepatic biliary drainage. Thai Journal of Radiol 1979; 16: 27
15. Weisner RH, LaRusso NF. Clinicopathologic features of the syndrome of primary sclerosing cholangitis. Gastroenterology 1980; 79: 200-260.