

A Study on the Opacification of the Gall Bladder in Endoscopic Retrograde Cholangiopancreatography(ERCP)

SHIANN PAN, CHEN-HSIUNG LIAO

SUMMARY

Endoscopic Retrograde Cholangiopancreatography(ERCP) was attempted on 179 patients in our hospital. Patients were divided into two groups: Demerol group and non-Demerol group, according to using or not using Demerol in pre-medication. The status of opacification of both the biliary tree and the gall bladder in each group was analyzed and compared with each other. On the overall successful rate of ERCP, Demerol group was only slightly higher than non-Demerol group(90.54%: 83.80%). However, Demerol group had apparently a higher successful rate of cholangiography(74.32%: 48.56%), as compared with non-Demerol group. On the opacification rate of the gall bladder, there was no significant difference between these two groups. The opacification rate of the gall bladder in overall cholangiograms was 67.92%. However, the opacification rate of the gall bladder in cases without cholecystectomy and with a well demonstrated biliary tree was 83.72% in total, 96.36% in normal gall bladder, 68.75% in gall stone, 77.77% in chronic cholecystitis without gall stone, and 67.86% in all the gall bladder disease. Most cases with non-opacification of the gall bladder in a well demonstrated biliary tree and without cholecystectomy were proved to have gall stone.

**Key words: Gall bladder stone*

Non-opacification of the gall bladder

Pharmacological (Demerol) ERCP

INTRODUCTION

In Taiwan, Endoscopic Retrograde Cholangiopancreatography(ERCP) has become a widely accepted procedure in the diagnosis of hepatobiliary and pancreatic diseases in

recent years. Clinical evaluations of ERCP have been reported by many authors, but the study on the opacification of the gall bladder in ERCP is still rare.⁽¹⁾

Demerol(meperidine HCL) has been used by some institutions as a part of premedica-

Department of Internal Medicine, Taipei Jen-Chi Hospital

* This paper had been presented at the 3rd Asian-Pacific Congress of Digestive Endoscopy, Taipei, Taiwan, R.O.C. September 25-27, 1980.

tion of ERCP in our country. Pharmacologically, Demerol may cause spasm of the biliary ducts and contraction of the gall bladder⁽²⁾⁽³⁾, so that we are very concerned about the possible effect of Demerol on the opacification of the gall bladder in ERCP.

The purpose of this study is to evaluate the opacification rate of the gall bladder on various conditions in ERCP, and to evaluate the possible effect of Demerol on the opacification of the gall bladder in ERCP.

MATERIALS AND METHODS

Between the period from December 22, 1977 to July 31, 1980, ERCP was attempted on 179 patients with suspicion of having hepato-biliary and/or pancreatic disease. The age of patients ranged from 8 to 95 years old.

The procedure was started with the patient lying on left side. Once the papilla of Vater was identified, the patient was rotated into prone position for best radiologic orientation.⁽⁴⁾ After the cannula was inserted into biliary duct, sufficient amount of contrast material was injected into the biliary system until the biliary tree was fully opacified. If the gall bladder was poorly or not opacified after the biliary tree was well

demonstrated, changing patient's position, even rotating the patient for several times, is necessary, in order to obtain a good cholecysto-cholangiogram.

With different premedication, we divided our patients into two groups: groups A and B. Group A was non-Demerol group. Its premedication consisted of antifoam agent (Gascon) 5 ml orally and anisotropine methylbromide (Valpine) 10 mg intramuscularly administered 20 minutes before the procedure, 8% Xylocaine sprayed to oropharynx and butylscopolamine bromide (Buscopan) 40 mg intravenously administered immediately before the procedure. Group B was Demerol group, to which, 50 mg of Demerol was given intramuscularly 20 minutes before ERCP, in addition to the same premedication as group A (Table 1). In this series, there were 105 cases of group A and 74 cases of group B.

RESULTS

As shown in Table 2, ERCP was successfully performed on 88 patients or 83.09% of group A, 67 patients or 90.54% of group B, and 155 patients or 86.59% in total. 106 cholangiograms were obtained out of 155 successful examinations, including 51 cho-

Table 1. Premedication of ERCP in Groups A & B

	Group A	Group B
Antifoam agent (Gascon) 5ml per os	+	+
Anisotropine methylbromide (Valpin) 10mg i.m.	+	+
8% Xylocaine oropharynx spray	+	+
Butylscopolamine bromide (Buscopan) 40mg i.v.	+	+
Meperidine HCL (Demerol) 50mg i.m.	-	+

Table 2. Rate of Successful ERCP

Results	Group A	Group B	Total	
Pancreatography alone	37(35.23%)	12(16.21%)	49(27.37%)	
Cholangiography alone	14(13.33%)	23(31.08%)	37(20.67%)	
Cholangio-pancreatography	37(35.23%)	32(43.24%)	69(38.54%)	
Successful	88(83.80%)	67(90.54%)	155(86.59%)	
Failure	17(16.19%)	7(9.45%)	24(13.40%)	
TOTAL	105	74	179	
Total cholangiograms	51(48.56%)	55(74.32%)	106(59.21%)	p < 0.01
GB opacification	35(68.62%)	37(67.27%)	72(67.92%)	p > 0.10
GB non-opacification	16(31.37%)	18(32.72%)	34(32.07%)	

GB: Gall Bladder

langiograms in group A and 55 in group B. The opacification rate of the biliary system was 48.56% in group A, 74.32% in group B, and 59.21% in total.

Among 51 cholangiograms of group A and 55 of group B, 35 cases or 68.62% of group A and 37 cases or 67.27% of group B were with opacification of the gall bladder. Table 3 presented the cases with opacification of both the biliary tree and the gall bladder in each group. With exception of chronic glandular cholecystitis with Rocky-tansky-Aschoff sinuses, there were 9 cases of gall bladder disease in group A and 10 in group B. Of these 9 cases in group A, 1 was acute cholecystitis, 1 was chronic cholecystitis with deformity of the gall bladder, 2 were chronic cholecystitis with biliary duct stone, and 5 were gall stone with or without biliary duct stone. Of these 10 cases in group B, 1 was chronic cholecystitis with deformity of the gall bladder, 3 were common bile duct stone with chronic cholecystitis, and 6 were

gall stone with biliary duct stone. The chronic glandular cholecystitis with R-A sinuses was not included in the category of gall bladder disease in this series, because it usually had no influence on the opacification of the gall bladder, and is usually with a nearly normal cholecystogram. On the other hand, a normal cholecystogram cannot rule out the possibility of chronic glandular cholecystitis with R-A sinuses.

As shown in Table 4, 16 cases or 31.37% of group A and 18 cases or 32.72% of group B were with non-opacification of the gall bladder. Of these cases, 7 cases of group A and 9 cases of group B were with poor demonstration of the biliary tree. Most of them were due to common bile duct stone or hepato-biliary and pancreatic tumor. 3 cases of group A and 1 of group B were with cholecystectomy. The remaining 6 cases of group A and 8 of group B were with a well demonstrated biliary tree and without cholecystectomy. Of these 6 cases of group A, 3

Table 3. Cholecysto-cholangiograms in Each Group

Results	Group A	Group B	Total
Biliary stone	14	20	34
GB stone	1	4	5
GB + CBD + IHD stone	1	0	1
GB + CBD stone	2	2	4
GB + IHD stone	1	0	1
CBD stone	5(1)	6(3)	11(4)
CBD + IHD stone	3(1)	7	10(1)
IHD stone	1	1	2
Acute cholecystitis	1	0	1
Chr. cholecystitis \bar{c} deformity of GB	1	1	2
Chr. glandular cholecystitis \bar{c} R-A sinuses	1	1	2
Dilatation of CBD \bar{s} stone	4	3	7
Irregularity of CHD and/or IHD	3	1	4
Normal biliary tree & normal GB	8	5	13*
Elongation of cystic duct	0	1	1
Tumor growth	3	5	8
Hepatoma	1	4	5
Cholangiocellular Ca.	0	1	1
Ca. of pancreas, body	1	0	1
Ca. of papilla of Vater	1	0	1
TOTAL	35	37	72

GB: Gall Bladder. CBD: Common Bile Duct. IHD: Intrahepatic Duct.

CHD: Common Hepatic Duct.

(): with chronic cholecystitis

* 6 out of 13 cases were with chronic pancreatitis

were proved to have gall stone with or without biliary duct stone and 3 were proved to have hepatic tumor. All the 3 cases of hepatic tumor were with abnormalities of intrahepatic ducts and/or common hepatic duct, one of them was proved to be with gall bladder invasion. While all the 3 cases of gall stone were with a normal cholangiogram. Of these 8 cases of group B, except 1 unproved case which was highly suspected gall stone clinical-

ly, only 2 cases were without definite cause of non-opacification of the gall bladder, all the remainder were proved to have gall stone or chronic cholecystitis.

As shown in Table 5, the non-opacification rate of the gall bladder in cases with a well demonstrated biliary tree and without cholecystectomy was 14.63% or 6 in 41 cases in group A, 17.77% or 8 in 45 cases in group B, and 16.27% or 14 in 86 cases in total. The

Table 4. Non-opacification of Gall Bladder in Each Group

Causes	Group A	Group B	Total
A. Poor filling of the biliary tree	7	9	16
Biliary stone	3	3	6
Tumor growth	2	4	6
Cholangiocellular Ca.	1	1	2
Ca. of pancreas, head	1	2	3
Ca. of CBD, distal end	0	1	1
Technic error	2	2	4
B. Post-cholecystectomy	3	1	4
C. Well filling of biliary tree without cholecystectomy	6	8	14
GB stone \bar{c} or \bar{s} biliary duct stone	3	2	5
CBD + IHD stone \bar{c} chr. cholecystitis	0	2	2
Destroyed GB	0	1	1
Hepatic tumor	3	0	3*
Choledochocyst	0	1	1
Sl. dilatation of CBD \bar{s} GB lesion	0	1	1
Normal cholangiogram, suspected GB stone clinically	0	1	1
TOTAL	16	18	34

* One of them was proved to be with GB invasion.

non-opacification rate of the gall bladder in cases with a well demonstrated biliary tree and without diseased gall bladder was 0% or 0 in 26 cases in group A, 6.89% or 2 in 29 cases in group B, and 3.63% or 2 in 55 cases in total. Comparison of group A and group B on the non-opacification rate of the gall bladder revealed that there was no significant difference statistically, indicating that Demerol had no influence on the opacification of the gall bladder in ERCP.

As shown in Table 6, among 86 cases with a well demonstrated biliary tree and without cholecystectomy, 28 cases were

proved to have gall bladder disease, including 16 cases of gall stone with or without biliary duct stone, 1 case of acute cholecystitis, and 9 cases of chronic cholecystitis without gall stone with or without biliary duct stone. The opacification rate of the gall bladder was 68.75% or 11 in 16 cases in gall stone, 77.77% or 19 in 28 cases in all the gall bladder disease.

DISCUSSION

For catching a good cholangiogram in ERCP, a prone position of the patient may be very important. In our experience, a

Table 5. Non-opacification Rate of the Gall Bladder in Cases without Cholecystectomy & with a Well Demonstrated Biliary Tree

Condition of GB	Non-opacification of GB			p Value
	Group A	Group B	Total	
Normal GB	0 in 26 0%	2 in 29 6.89%	2 in 55 3.63%	> 0.05
Proved diseased GB	4 in 13 30.76%	5 in 15 33.33%	9 in 28 32.14%	> 0.10
Suspected diseased GB	2 in 2 100%	1 in 1 100%	3 in 3 100%	
Total	6 in 41 14.63%	8 in 45 17.77%	14 in 86 16.27%	> 0.10

Table 6. Status of Opacification of the Gall Bladder in 28 Cases of Proved Gall Bladder Disease

I. Non-opacification of the gall bladder 9 cases, 32.14%	
GB stone	3
GB + CBD stone	1
GB + CBD + IHD stone	1
Destructed GB	1
Chr. cholecystitis + CBD + IHD stone	2
Hepatic tumor c̄ GB invasion	1
II. Opacification of the gall bladder 19 cases, 67.85%	
GB stone	5
GB + CBD stone	4
GB + CBD + IHD stone	1
GB + IHD stone	1
Chr. cholecystitis + CBD stone	4*
Chr. cholecystitis + CBD + IHD stone	1
Chr. cholecystitis c̄ deformity of GB	2
Acute cholecystitis	1

* 3 out of 4 cases were with contracted GB.

prone position usually makes the intrahepatic ducts to be filled with the contrast media quickly. A good cholecysto-cholangiogram is usually obtained after the biliary tree is sufficiently filled with the contrast material. In some cases, the gall bladder is not opacified immediately after the biliary tree is well demonstrated, until an adequate postural change has been done. A complete study of biliary system should include a good cholecystogram.

In this series, although the overall successful rate of ERCP on Demerol group was only slightly higher than non-Demerol group, the Demerol group had apparently a higher successful rate of cholangiography (74.32%: 48.56%, $p < 0.01$), as compared with non-Demerol group. It is probably due to the fact that the patient of non-Demerol group are more irritable and uncomfortable than Demerol group. On the other hand, the non-Demerol group includes the initial 50 attempts of ERCP in our hospital, an unskillfulness probably plays a role on the lower successful rate of cholangiography.

In this study, we found that Demerol had no influence on the opacification of the gall bladder in ERCP, and the Demerol group had apparently a higher successful rate of cholangiography. So that, administration of Demerol before the procedure of ERCP is indicated.

In our series, the opacification rate of the gall bladder in cases with a well demonstrated biliary tree and without cholecystectomy was 83.72% in total, 67.86% in diseased gall bladder, and 96.36% in normal gall bladder. Among the cases in whom the gall blad-

der was not opacified in a well demonstrated cholangiogram and the condition of the gall bladder was proved, 81.81% or 9 in 11 cases were with diseased gall bladder, most of them were gall stone. Although some cases of hepatic tumor may also cause non-opacification of the gall bladder in ERCP, the differential diagnosis between the benign gall bladder lesion and the hepatic tumor is not difficult, because the latter has abnormalities of the biliary tree usually, while the former has a normal cholangiogram. So that, if the gall bladder is not opacified in a well demonstrated and normal cholangiogram in ERCP, gall bladder disease, especially gall stone, should be considered.

REFERENCES

1. Takeuchi T., et al: Diagnosis of Biliary Tract Neoplasms, *Stomach and Intestine*, 12(6); 718, 1977.
2. Oddis J. A.: *American Hospital Formulary Service*, Washington D. C., American Society of Hospital Pharmacists, p. 1115, 1971.
3. Baker C. E.: *Physicians' Desk Reference*, New Jersey, Medical Economics Company, 32nd Ed.; p. 1783, 1978.
4. Belber J. P.: Endoscopic Retrograde Cholangiopancreatography (ERCP) and The Skinny Needle. In Fordtran J. S., Sleisenger M. H. (eds): *Gastrointestinal Disease: Pathology, Diagnosis, Management*, Philadelphia, W. B. Saunders Company, 2nd Ed; pp. 1366-1387, 1978.
5. 菅田文夫, 山村光久: 胆石症の診断 *Medico Vol. 11, No. 4, p. 8, 1980.*

內視鏡逆行性胆胰管攝影術之 膽囊顯影之探討

潘 憲 廖正雄

本文之目的在於探討逆行性胆胰管攝影術之膽囊顯影情況，並研究Demerol (Meperidine HCL) 對膽囊顯影是否有影響。

自民國66年12月至69年7月，本院共施行內視鏡逆行性胆胰管攝影術凡179例，年齡最輕的8歲，最老的95歲。我們將病人分為A、B兩群；A群之前處置不使用Demerol，B群之前處置包括Demerol 50毫克肌注。對此兩群之胆道及膽囊之顯影情況加以分析比較。

本系列整體的胆胰管攝影術之成功率：A群83.80%，B群90.54%，並無多大差異。但胆管顯影率則A群48.56%，B群74.32%，B群明顯地比A群為高($P < 0.01$)。就胆道系統充分顯影且膽囊未切除者而言，其膽囊不顯影率A群為14.63%，B群為17.77%，計16.27%，其中經證實為膽囊疾患其膽囊不顯影率A群為30.76%，B群33.33%，計32.14%；經證實膽囊正常者其膽囊不顯影率A群為0% B群6.89%，計3.63%。比較上述結果，雖B群之不顯率似乎略高於A群，但無統計學上有意義之差別($P > 0.05$)。雖整體的胆道顯影病例其膽囊顯影率只有67.92%，但胆道充分顯影且膽囊未切除者其膽囊顯影率高達83.72%，其中經證實膽囊正常者其膽囊顯影率為96.36%，經證實有膽囊疾患其膽囊顯影率為67.86%，而膽囊結石病例其膽囊顯影率為68.75%，慢性膽囊炎而無膽結石者其膽囊顯影率為77.77%。在本系列中膽囊不顯影之最大原因為胆道充盈不良，但胆道系統充分充盈之病例中，膽囊不顯影且膽囊情況已證實者，除2例外均確有膽囊疾患，其中大多數為膽結石。

由本研究得知：(1)注射對比劑時病人是否俯臥，對比劑是否充分充盈胆道系統，及對比劑充盈胆系後是否充分的變換病人的體位，常影響胆胰管攝影術之膽囊顯影；(2)Demerol 對膽囊的顯影並無影響，且使用Demerol 者胆系顯影率明顯地增高；(3)胆胰管攝影術如能獲取良好的胆系圖像，則膽囊正常者幾乎都可顯影，如膽囊不顯影應考慮膽囊不正常尤其是膽結石。

台北仁濟醫院內科

1980年9月25~27日於第三屆亞太地區消化系內視鏡學會宣讀