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A retrospective study of surgical common bile-duct exploration: ten years experience

J. A. ROUKEMA, E. J. CAROL, F. LIEM AND DR. J. J. JAKIMOWICZ

The results of surgical common bile duct exploration in 1007 patients were evaluated in a retrospective study. Overall mortality was 2%. Under the age of 70 years mortality was 0.9%. Mortality increased significantly in patients older than 80 years (9.5%), including the patients with acute cholangitis. The most frequently encountered complications were wound infection in 7%, severe pulmonary insufficiency in 4%, and cardiovascular problems in 3%. The results of the present series show that in the current state of pre-, intra- and postoperative care surgical common bile-duct exploration has a low morbidity and mortality rate in patients under 80 years of age.

Introduction

Biliary lithiasis is one of the commonest illnesses in highly industrialised countries and represents a major cause of hospitalisation, morbidity, surgical treatment and health care costs. The hope that dissolution therapy might become a substitute for surgical therapy in biliary lithiasis has not yet been fulfilled¹⁻⁸. Currently the definitive solution for biliary lithiasis still consists of cholecystectomy with or without common bile-duct exploration.

It is generally accepted that cholecystectomy combined with common bile-duct exploration carries a higher morbidity and mortality, particularly in elderly patients. In the last decade the increased popularity of endoscopic sphincterotomy for the treatment of common bile-duct stones has been based mainly on the good results achieved in highly experienced centers, resulting in increasing reluctance to refer patients for surgery. Endoscopic removal of common bile-duct stones is recommended as, according to reports from these centers, the morbidity and mortality is significantly lower than that of surgical exploration of the common bile-duct.⁹⁻¹⁴ These recommendations are based on comparison of the current results of endoscopic therapy with older retrospective studies of surgical therapy.⁹⁻¹⁴

The aim of our study is to evaluate the results of surgical exploration of the common bile-duct in the decade from January 1971 to December 1980.

Material and methods

In a retrospective study the records of all patients undergoing common bile-duct exploration between January 1971 and December 1980 at the Catharina Hospital, Eindhoven and the St. Franciscus Hospital, Rotterdam were reviewed and the data computerized. Patients with malignant lesions of the biliary tract were excluded from the study. During this ten year period 1007 patients underwent common bile-duct exploration, out of 3891 patients operated on for biliary lithiasis.

Indications for common bile-duct exploration were palpable stones, cholangitis, positive cholangiography and dilatation of the common bile-duct (> 12 mm). The following relative indications were generally used: jaundice, abnormal liver function tests, pancreatitis and small stones in the gallbladder in combination with a dilated cystic duct. Cholangiography and bile-duct pressure measurement (Caroli) were done as an intra-operative routine at the St. Franciscus hospital but only occasionally at the Catharina hospital. Nevertheless there was no difference in positive common bile-duct explorations between the two hospitals. Sex and age distribution of the patients is presented in Table I, and the diagnosis and indications for operation in Table II.

In 835 patients, common bile-duct exploration was combined with cholecystectomy. In 557 patients (55%) stones were found in the biliary tract at exploration, and in 450 patients (45%) no stones were found. In 42 cases (4%) re-exploration of the common bile-duct was performed after previous surgery (Table III). In 69 patients exploration of the common bile-duct was extended by performing either choledochoduodenostomy (44 patients), transduodenal papillotomy (9 patients), papilloplasty (14 patients) or choledochojejunostomy (2 patients). T-tube drainage was used, even when choledochoduodenostomy had been done and T-tube cholangiography was always performed before its removal. The routine use of intraoperative choledochoscopy was introduced at the St. Franciscus

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TABLE I. Sex and age distribution

age (yrs)	women	men	total
< 70	497	160	657 (66%)
70-79	186	80	266 (26%)
> 80	59	25	84 (8%)
total	742	265	1007

TABLE II. Diagnosis and indications for operation

diagnosis	no.
cholelithiasis	835
choledocholithiasis	557
jaundice	150
acute cholecystitis	95
post-pancreatitis	61
cholangitis	59

TABLE III. Operative results of common bile-duct exploration

	no.	mortality
positive exploration	557 (55%)	13 (2.3%)
negative exploration	450 (45%)	7 (1.5%)
re-exploration	42 (4%)	1 (2.3%)

TABLE IV. Complications of choledochotomy

	no.	percentage
wound infection	68	7
retained stones	43	4
pulmonary complications	39	4
cardiovascular complications	29	3
urogenital complications	24	2

TABLE V. Mortality in different age groups

age (yrs)	no.	mortality
< 70	657	6 (0.9%)
70-79	266	7 (2.6%)
> 80	84	8 (9.5%)
total	1007	21 (2.0%)

Hospital in 1976 and at the Catharina Hospital in 1980, significantly influencing the incidence of retained biliary stones.

All complications necessitating therapeutic measures were obtained from the files (Table IV). Wound infection was the most frequent postoperative compli-

cation, followed by severe pulmonary insufficiency. Twenty-one patients died within 30 days of operation (2%). Table V shows the mortality rate in the different age-groups. In patients older than 80 years the mortality was high (10%). Twelve (15%) of these patients had acute cholangitis and were in a poor condition. There was a difference in overall mortality rate between men and women (respectively 4.5% and 1%). The causes of death were cardiovascular complications (11 patients), sepsis (7 patients) and another three died of pulmonary complications. Thromboembolism was not a proven cause of death.

Discussion

There is much discussion about the risks of common bile-duct exploration. How important these risks are is difficult to establish solely on the grounds of review of the literature. The different patient populations in various series and lack of uniformity in the criteria for evaluation of the data make comparison of the percentage mortalities reported unreliable, if not impossible. The frequently cited data from often several decades old retrospective studies do not reflect the true current position of this procedure.

In our opinion important changes in operative indications and improvement of pre-, intra- and postoperative care in the last 15 years have resulted in lower mortality and morbidity rates. With this in mind, we consider simple cholecystectomy to be a safe procedure with a low overall mortality estimated to be in the range of 0.5%¹⁵⁻¹⁹. Our overall mortality rate for simple cholecystectomy was 0.35% (10 deaths in 2884 cholecystectomies). The overall mortality of common bile-duct exploration in our series was 2%, with no significant difference between the groups of patients with positive common bile-duct exploration, negative exploration or re-exploration (Table III). In patients under 70 years of age a mortality of 0.9% was encountered. Age therefore, as previously stressed by other authors, is an important prognostic factor.¹⁷⁻²⁴ However, in our series the increase in mortality was only statistically significant ($p < 0.01$; chi-square test in patients of 80 years or older (Table V). Data on the mortality of common bile-duct explorations in patients older than 80 years are scarce. Some authors found in this group of patients an impressive difference between elective and emergency procedures.^{16,25} In our series 84 patients were in the ninth decade and eight of these died (9.5%) (Table V). Elective common bile-duct exploration was performed in this group in 72 patients with a mortality rate of 5% (4 patients died), but of the 12 patients subjected to emergency surgery because of acute cholangitis four died (33%).

In the total group of patients with cholangitis at op-

eration (59 patients) the mortality was six times higher (12%) than the overall mortality. But it should be noted that the mean age of patients in this group was 71 years while the overall mean age was only 61 years. As stressed by others acute cholangitis remains a serious disease with a high mortality.²⁶⁻²⁸ As no randomized comparative studies of endoscopic papillotomy versus surgical common bile-duct exploration are available, and as data regarding results in aged patients are lacking, comparison of the morbidity and mortality of endoscopic papillotomy with those of surgical common bile-duct exploration only reflects a trend. In the literature the mortality of endoscopic papillotomy ranges from 0.7-6.0%.^{9-14, 29} In a non-randomized study the results of surgical common bile-duct exploration and endoscopic papillotomy for common bile-duct lithiasis in two marginally comparable groups of patients show a mortality after common duct exploration of 0.8% as against 6% after endoscopic papillotomy.²⁹ It should be stressed that endoscopic papillotomy has an average success-rate of around 90%, while no assessment of long-term results has been established.⁹⁻¹⁴

Based on our experience, we conclude that in the current state of pre-, intra- and postoperative care surgical common bile-duct exploration has a low morbidity and mortality rate in patients under 80 years of age. Promoting endoscopic papillotomy for the treatment of choledocholithiasis solely on the basis of lower morbidity and mortality compared with surgical treatment is not justified in view of current surgical results. The choice of a therapeutic method in aged patients should be based on critical evaluation of the risk factors and the expected end-results of treatment, looked at for each patient individually. To formulate a reliable opinion on the question 'which therapy when?' multicenter randomized long-term studies are advisable.

Key words

common bile-duct exploration
choledocholithiasis

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Samenvatting

De resultaten van ductus-choledochus-exploratie bij 1007 patiënten werden retrospectief geëvalueerd. Voor de gehele groep bedroeg de mortaliteit 2% en bij patiënten jonger dan 70 jaar 0,9%. De mortaliteit toonde bij patiënten ouder dan 80 jaar een significante stijging tot 9,5%. In deze groep kwam frequent cholangitis voor. Wondcomplicaties werden bij 7% van de patiënten gezien, ernstige pulmonale insuffi-

ciëntie bij 4% en cardiovasculaire complicaties bij 3%. Op basis van deze gegevens kan gesteld worden dat exploratie van de ductus choledochus bij de huidige perioperatieve zorg een lage morbiditeit en mortaliteit heeft bij patiënten jonger dan 80 jaar.

Résumé

Dans une étude rétrospective, les résultats de l'exploration chirurgicale du canal cholédoque à été évaluée chez 1007 malades. La mortalité en-dessous de 70 ans a été de 0,9% et la mortalité globale de 2%. La mortalité a été nettement plus élevée chez les malades de plus de 80 ans (9,5%), malades atteints d'angiocholite aiguë compris. Les complications les plus fréquentes ont été les infections de la plaie opératoire (7%), l'insuffisance pulmonaire grave (4%) et les problèmes vasculaires (3%). A la lumière de notre expérience, nous concluons que dans les conditions actuelles de soins pré-, per- et postopératoires de l'exploration chirurgicale du canal cholédoque, la morbidité et la mortalité chez les malades de moins de 80 ans restent faibles.

Zusammenfassung

In einer retrospektiven Studie wurden die Ergebnisse der Gallengangsexploration bei 1007 Patienten ausgewertet. Die Gesamtleitlätät betrug 2%. In der Gruppe der unter 70-jährigen lag sie bei 0,9%. Die Letalität der Patienten, die älter als 80 Jahren waren, stieg signifikant an (9,5%), eingeschlossen sind die Patienten mit akuter Cholangitis. Die häufigsten Komplikationen waren: 7% Wundinfektionen, 4% schwere Lungeninsuffizienzen und 3% kardiovaskuläre Dysfunktionen. Unsere Erfahrungen belegen, daß beim derzeitigen Stand der prä-, intra- und postoperativen chirurgischen Behandlung die Gallengangsexploration der Patienten unter 80 Jahren eine geringe Morbidität und Letalität hat.

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