

# Natural history of Asymptomatic Bile Duct stones at time of cholecystectomy

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## STRUCTURED ABSTRACT

**Objectives:** There is little data on the natural history of asymptomatic bile duct stones and hence there is uncertainty on the management of asymptomatic bile duct stones discovered incidentally at the time of laparoscopic cholecystectomy. We retrospectively reviewed a group of patients who had previously undergone laparoscopic cholecystectomy, but who did not have a pre-operative suspicion of intra-ductal stones, to determine if any biliary complications had subsequently developed. A group of patients who had no pre-operative suspicion of intra-ductal stones, but routinely underwent intra-operative cholangiogram (IOC) at time of cholecystectomy, served as the control group.

**Methods:** A telephone questionnaire was completed by each patient's family practitioner in 59 of 79 (75%) patients who underwent laparoscopic cholecystectomy. In the remaining 20 patients additional information was obtained from hospital records and from the central services agency (CSA). These patients had no pre-operative suspicion of bile duct stones and therefore did not undergo an IOC or ERCP. The control group (73 patients) had no pre-operative suspicion of bile duct stones but had a routine IOC performed to define the biliary anatomy.

**Results:** 59 patients were followed up for an average of 57 months (range 30 – 78 months) after laparoscopic cholecystectomy. None of these patients developed pancreatitis, jaundice, deranged liver function tests (LFT's), or required ERCP or other biliary intervention. In the additional 20 patients where no information was available from the family practitioner, 11 patients had follow up appointments with no documentation of biliary complications or abnormal LFT's. 19 of 20 patients were traceable through the CSA and were all alive. Only 1 patient was untraceable and therefore unknown if biliary complications had developed. In the control group, 4 of 73 (6%) patients had intraductal stones detected and extracted. Thus the prevalence of asymptomatic bile duct stones during the time of cholecystectomy in our population was 6%.

**Conclusions:** Asymptomatic bile duct stones discovered at the time of cholecystectomy do not appear to cause any biliary complications over a 5-year follow up. Incidental bile duct stones found in patients undergoing laparoscopic cholecystectomy may not need to be removed.

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## INTRODUCTION

Common bile duct stones are commonly found in patients undergoing cholecystectomy. The probability of co-existing ductal stones increases with age, being 6% in younger patients (less than 80 years old) and 33% in patients over 80 years.<sup>1</sup> Studies have estimated the prevalence of asymptomatic bile duct stones in Western populations to be between 5.2% - 12%.<sup>2-5</sup> It is accepted practice to extract symptomatic ductal stones due to the risk of recurrent biliary obstruction, cholangitis and pancreatitis.<sup>6</sup> It is recommended that common duct stones, even if incidental should be removed, as these patients will characteristically develop complications such as cholangitis, pancreatitis, biliary pain or jaundice.<sup>7</sup> However these recommendations are based on little data, except on historical studies.<sup>8</sup>

The clinical relevance and management of asymptomatic bile duct stones remain controversial. Few studies have directly looked at the management of truly asymptomatic bile duct stones because if ductal stones were detected they were subsequently removed. Other studies, in which ductal stones were left in situ, did not directly look at asymptomatic bile duct stones.

## AIM

In our unit, the use of intraoperative cholangiogram (IOC) varies according to surgeon preference. The aim of this study was to retrospectively examine a group of patients who underwent laparoscopic cholecystectomy, but who did not have a pre-operative suspicion of ductal stones (and therefore did not undergo routine IOC or pre-operative ERCP), to determine if they had developed any biliary complications over a 5-year follow up period. This study was based on the assumption that this group of patients would have included a number of patients with asymptomatic bile duct stones.

## METHODS

Consecutive patients who underwent laparoscopic cholecystectomy between April 1993 and March 1997 were identified from recognised hospital codes during retrospective case note review. These operations were performed on 2 sites (UHD and AH) within the Trust. Only cholecystectomies performed at a single site (UHD) were examined and the rest excluded. Patients who had a pre-operative suspicion of choledocholithiasis (i.e. liver function tests (LFT's) were within normal range, no evidence of pancreatitis, jaundice or cholangitis, and no biliary dilatation on ultrasound examination) were also

excluded from analysis. The study group comprised those patients without a pre-operative suspicion of choledocholithiasis and in whom no IOC or (pre or post operative) ERCP was performed. The control group was those patients with no pre-operative suspicion of choledocholithiasis but whom had IOC performed routinely. The control group had similar demographics to the study group but were not specifically age and sex matched.

Follow up of the study group was in the form of a telephone questionnaire to the patients respective family practitioners questioning whether patients had attended with complaints consistent with biliary pain or pancreatitis, abnormal LFT's, or had required any further biliary procedure including abdominal ultrasound or ERCP. If family practitioners were not contactable by telephone, follow up was obtained by reviewing hospital notes and/or by contacting the Central Services Agency (CSA) to determine if any patients had died.

## RESULTS

A total of 423 consecutive patients were considered for review. Of these 423 patients, 190 patients had their procedure carried out in a separate centre and were not included in the analysis. From the remaining 233 patients, 81 (35%) patients had a pre-operative suspicion of concomitant bile duct stones based on raised LFT's, or duct dilatation on imaging and were also excluded from the analysis. In the remaining group of 152 patients, 79 patients had no pre-operative suspicion of ductal stones and no IOC or pre-operative ERCP was performed (study group). The other 73 patients also had no pre-operative suspicion of ductal stones but routinely had an IOC performed at time of laparoscopic cholecystectomy due to the surgeon's preference to determine the biliary anatomy (control group). Five (6%) patients in the study group had their operation converted to an open cholecystectomy compared to 7 (10%) patients in the control group.

A 75% response rate was achieved from telephone questionnaires. The majority of the remaining 25% (20/79) of patients were no longer with their indexed family practitioners. In these patients where no information was available from the family practitioner, 11 patients had follow up hospital appointments prior to and after the 5-year follow up period with no documentation of biliary complications or abnormal LFT's. 19 of 20 patients were traceable through the CSA and were all alive. Only 1 patient was untraceable and therefore unknown if biliary complications had developed.

The control group consisted of 73 patients (64 females: 9 males). Mean age of patient was 53.5y. In this control group, 4 out of the 73 patients i.e. 6% of patients had intra-ductal stones detected at time of surgery by IOC. These were removed either endoscopically post surgery or underwent open bile duct exploration at the index operation. Therefore the prevalence of asymptomatic bile duct stones in our population was 6%.

Family practitioner data was available for 59 of 79 patients in the study group (n=59. 53 females: 6 males). Mean follow up period following cholecystectomy was 57 months (range 30 - 78 months). Mean age of patient was 52y (range 31y-84y). Some of the study group patients had attended their family practitioners since cholecystectomy:- 4 patients with symptoms of gastro-oesophageal reflux disease, 2 patients diagnosed with duodenitis following OGD, 1 patient diagnosed with diverticulitis following barium enema for lower abdominal pain. 1 patient had ongoing nausea and 1 patient was diagnosed with neuropathic pain and referred to a pain clinic. However, none of the patients in the study group had any episodes of pancreatitis, jaundice, deranged LFT's or required ERCP or other biliary investigations in the 5-year period following laparoscopic cholecystectomy.

## DISCUSSION

There is consensus that symptomatic bile duct stones should be removed. In an early series in 1941,<sup>8</sup> 38 patients who refused surgery or were considered unfit for surgery were followed for 6 months to 13 years. 45% remained asymptomatic and 55% developed complications such as biliary colic, jaundice and cholangitis. Johnson and Hosking reported similar outcomes with over 50% of patients with retained duct stones developing symptoms with 25% developing resultant serious complications.<sup>1</sup> The natural history of symptomatic bile duct stones appears to be less benign than that of asymptomatic gallstones.<sup>9</sup> However, many common bile duct stones pass spontaneously without any symptoms.<sup>10,11</sup> Acosta *et al* demonstrated gallstones in the faeces in 11.8% of patients with known gallstones but without symptoms of bile duct stones.<sup>2</sup> In a randomised study by Murison, patients who were undergoing cholecystectomy, but without symptoms of common duct stones, were randomized to IOC or no IOC. Bile duct stones were discovered in 12% of patients in the cholangiography group. It was assumed that a similar percentage of patients in the group without

cholangiography had stones but none developed symptoms in over 3 years of follow-up.<sup>3</sup>

The likelihood of stones passing spontaneously and the risk of bile duct stones causing symptoms may be dependent on size but data supporting this is limited.<sup>12</sup> Stones up to 8 mm may pass without problems; a study where bile duct stones were left deliberately were shown to pass spontaneously when ERCP was later performed.<sup>13</sup>

Selective cholangiography for those patients with predictors of common bile duct stones appears to stratify patients in detecting a higher proportion of patients with ductal stones and thereby reducing costs.<sup>14-22</sup> This approach reduces the number of ductal explorations but will result in missed stones. Importantly, these missed stones seem not cause any morbidity in follow up of these patients.

In our study, the prevalence of incidental ductal stones detected at time of cholecystectomy was 6%. We would expect a similar prevalence in our study group of patients who underwent cholecystectomy but without cholangiogram i.e. 4 or 5 patients. Follow up of these patients over a 5-year period, revealed no complications related to bile duct stones. Other studies have indicated that if retained ductal stones become symptomatic, they do so prior to discharge following cholecystectomy, or within 3 years of cholecystectomy.<sup>23,24</sup> This study confirms data from a previous study by Murison who randomised 285 patients requiring cholecystectomy, but without suspicion of bile duct stones, into 2 groups. Group 1 underwent perioperative cholangiogram and group 2 did not. Bile duct stones were detected in 12% of patients in group 1. Follow up of the patients in group 2 over a 3-year period revealed no symptoms or complications related to retained bile duct stones.<sup>3</sup> Our study supports the conclusions of Murison *et al*.

There are several potential weaknesses of this study. The prevalence of asymptomatic bile duct stones in our population was low (6%) but consistent with other published studies.<sup>1</sup> A consequence of this low prevalence rate is the small number of patients in the study group who would be expected to have had intra-ductal stones at the time of cholecystectomy. As information was not available from patients' family practitioners in 25% of our study group, we obtained information on these patients from hospital records and computerised laboratory systems to ensure no biliary complications had occurred. The CSA was also contacted to ensure these patients had not died

as a result of biliary complications. In addition, the retrospective design of this study may have inherent recall bias. The telephone questionnaire relied on family practitioners to recall patient visits with biliary complications and some patients may have been missed due to lack of documentation or incorrect coding. Although not specifically age or sex matched, the control group had similar demographics to the study group and therefore we feel the prevalence of intra-ductal stones in the control group would also be valid for the study patients.

We believe that routine intra-operative cholangiography in order to detect coincidental bile duct stones is not required in patients without clinical, biochemical or radiological evidence of ductal stones. This may result in missed ductal stones, but importantly these did not cause any morbidity during a 5-year follow up.

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