ORIGINAL ARTICLE

Fortuitous discovery of common bile duct stones: Results of a conservative strategy

Lithiase de la voie biliaire principale de découverte fortuite : résultats d’une attitude conservatrice

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Summary
Objective. — The incidence of fortuitously discovered stones in the common bile duct is about 5%. The purpose of this study was to determine the rate of spontaneous clearance of asymptomatic stones in the common bile duct discovered fortuitously during cholecystectomy.

Patients and methods. — Intraoperative cholangiography was performed in all patients undergoing cholecystectomy for symptomatic gallbladder stones. If a filling defect of the common bile duct was discovered, a transcystic drain was inserted. Surgical or endoscopic extraction was not proposed initially. A control cholangiogram was performed on the second postoperative day then during the sixth postoperative week. If a stone persisted at the sixth week, endoscopic extraction was undertaken.

Results. — Cholecystectomy was performed in 124 patients with symptomatic gallstones and no signs predictive of stones in the common bile duct. A stone was found fortuitously in the common bile duct in 12 patients. The control cholangiogram was normal in two of these patients on day two (16.7%) and in six others (50%) at the six-week control. All 12 patients remained free of symptoms suggesting the presence of a stone in the common duct. Presence of the drain had no impact on quality-of-life. Endoscopic extraction was finally performed for four patients (33.3%) to remove a stone from the common bile duct.

Conclusion. — Early surgical or endoscopic extraction of stones in the common bile duct should not be undertaken systematically in asymptomatic patients. Spontaneous asymptomatic clearance of the common bile duct is observed in about half of patients.

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Résumé L’incidence de la lithiase de la voie biliaire principale de découverte fortuite est d’environ 5%. Le but de cette étude était de déterminer la fréquence de la migration
Fortuitous discovery of common bile duct stones

spontanée des calculs asymptomatisques de la voie biliaire principale découverts au moment de la cholécystectomie. Tous les patients traités par cholécystectomie pour lithiase asymptomatique de la voie biliaire accessoire ont eu une cholangiographie peropératoire. En cas de découverte d’une image lacunaire de la voie biliaire principale, un drainage transcystique a été mis en place. Aucune extraction chirurgicale ou endoscopique systématique n’a été proposée initialement. Une cholangiographie de contrôle a été réalisée le deuxième jour puis au cours de la sixième semaine. En cas de calcul résiduel à la sixième semaine, une extraction endoscopique de principe a été proposée.

Résultats. — Cent vingt-quatre patients ont été opérés d’une lithiase vésiculairesymptomatique sans signe prédictif de lithiase de la voie biliaire principale. Douze patients avaient une lithiase fortuite de la voie biliaire principale. Un drainage transcystique a été mis en place chez ces 12 patients. La cholangiographie de contrôle était normale chez deux patients (16,7 %) au deuxième jour et chez six autres (50 %) à la sixième semaine. Dans l’intervalle, aucun des patients n’a eu de symptôme en rapport avec la présence de calcul dans la voie biliaire principale. Aucun des patients n’a allégué une altération de sa qualité de vie liée à la présence du drain. Quatre patients ont finalement été traités par extraction endoscopique de principe (33,3 %).

Conclusion. — L’extraction chirurgicale ou endoscopique précoce ne devrait pas être proposée systématiquement à tous les patients ayant une lithiase asymptomatique de la voie biliaire principale. L’expulsion spontanée et asymptomatique des calculs de la voie biliaire principale survient dans plus de la moitié des cas.

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Introduction

Debate continues concerning the appropriate strategy when a stone is found fortuitously in the common bile duct during cholecystectomy for a symptomatic gallbladder [1]. For many, the risk of a potentially life-threatening complication (acute pancreatitis or cholangitis) warrants systematic extraction of all stones in the common bile duct, whether symptomatic or not [2]. With adapted equipment and a well-trained team, this can be done during the same operation, but necessarily requires more time. Furthermore, both the endoscopic and the surgical method lengthen the hospital stay, possibly leading to organizational problems when cholecystectomy was scheduled as an outpatient procedure or within the framework of a very short hospitalization [3,4].

It is known that a certain number of the stones detected in the common bile duct will migrate spontaneously, and asymptomatically [5–8]. One recent monocentric study noted that the rate of asymptomatic clearance is more than 50% after simple transcystic drainage [5]. The purpose of this study was to determine whether this finding could be reproduced by a team of several operators using the same protocol.

Patients and methods

All patients who underwent cholecystectomy in our unit between January 2004 and October 2005 for gallbladder stones were eligible for inclusion in this prospective study.

After history taking and physical examination, preoperative explorations included laboratory tests (cell counts, liver battery) and hepatobiliary ultrasound. Patients presenting one or more signs predictive of lithiasis of the common bile duct — preoperative jaundice, acute pancreatitis, abnormal liver tests, dilatation of the common bile duct greater than 8 mm at ultrasound or visualization of a stone in the common bile duct [9] — were not retained for the study.

Transcystic intraoperative cholangiography was performed as part of the cholecystectomy procedure, with two objectives: detection of stones in the common bile duct and search for anatomic anomalies of the biliary tree [10]. This cholangiography (opacification with Hexabrix® diluted 50%) was a two-phase procedure: first thin slice images to detect stones in the common bile duct, then a complete cholangiogram to rule out any biliary wound. Two senior surgeons (PB and ET) interpreted the opacification images.

If the transcystic intraoperative cholangiography revealed a filling defect in the common bile duct, a transcystic drain (escat or pédinielli, Porges®) was inserted, with no other surgical maneuver. A control transcystic cholangiography was performed on the second postoperative day. The drain was temporarily clamped at patient discharge. Patients were given detailed information about what to do in the event of pain, shivers or fever, pruritis or jaundice, and were shown how to open the drain for gravity drainage before emergency consultation.

If the control cholangiography performed on the second postoperative day was considered normal, the drain was withdrawn the second postoperative week at an outpatient clinic. If the cholangiography was considered abnormal, follow-up included control visits (physical examination and laboratory tests) during the third and sixth postoperative weeks. A transcystic cholangiography was performed systematically at the sixth-week visit.

If the common bile duct lithiasis persisted at six weeks, endoscopic extraction of the main stone or stones was proposed.

All patients were informed about the study protocol and gave their oral consent for participation. Before patient discharge, the investigators checked carefully that the patient was well aware of the maneuvers to be performed should an emergency situation arise.

Results

During the study period, 161 patients underwent laparoscopic cholecystectomy for symptomatic gallbladder stones. Among these 161 patients, 124 did not have any sign predictive of lithiasis of the common bile duct and were thus included in this study. Mean age was 55 years (range 37–75 years); the M/F sex ratio was 0.37. Eighty-one
patients presented hepatic colic, 42 acute cholecystitis, and one a
gallbladder polyp (Table 1).

Conversion to laparotomy was required for seven of the 124
patients (5.8%). Transcystic intraoperative cholangiography was
performed successfully in 90.3% of patients. The main causes of
failure were small-caliber cystic duct (n = 9) and pediculitis (n = 3).

A fortuitous diagnosis of lithiasis of the common bile duct was
established in 12 patients (9.7% of the patients undergoing chole-
cystectomy without signs predictive of lithiasis of the common bile
duct). The time course of the liver tests from these 12 patients
is presented in Table 2. All 12 patients who had a fortuitously
discovered stone in the common bile duct agreed to the planned
schedule. The control cholangiography performed on the second
postoperative day was considered normal in two patients (16.7%).
The control cholangiography performed during the sixth postop-
erative week was considered normal in six patients (50%). The
four other patients were symptom-free at six weeks and under-
went endoscopic extraction of the stone(s) in the common bile
duct (Figs. 1 and 2). The median hospital stay for these 12 patients
was four days; the median hospital stay for the other 112 patients
was three days. The median cumulative hospital stay for the
four patients who underwent endoscopic retrograde cholangiopan-
creatography (including the stay for cholecystectomy and for the
stay for endoscopic retrograde cholangiopancreatography) was six
days.

The largest stone which migrated measured 8 mm. The largest
proportion of the stones which migrated measured 5 mm. Residual
stones at six weeks measured less than 5 mm in two patients (a
single stone for one patient, more than 20 stones for the other).
No stones could be individualized in the two other patients whose
common bile duct contained sludge.

All 12 patients remained symptom-free during the six-week
postoperative follow-up; none of them opened their drain in an
emergency situation and none of them complained about having
the drain.

Table 1  Characteristic features of 12 patients with asymptomatic stones in the common bile duct revealed by intraoperative
cholangiography.

<table>
<thead>
<tr>
<th>characteristic</th>
<th>Patients with a stone in the common bile duct n = 12</th>
<th>Other patients n = 112</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years (range)</td>
<td>63 (21—85)</td>
<td>53 (22—88)</td>
</tr>
<tr>
<td>Male/female</td>
<td>5/7</td>
<td>38/74</td>
</tr>
<tr>
<td>Median operative time, minutes (range)</td>
<td>85 (70—140)</td>
<td>55 (35—160)</td>
</tr>
<tr>
<td>Median hospital stay, days (range)</td>
<td>4 (3—13)</td>
<td>3 (1—21)</td>
</tr>
<tr>
<td>Indications</td>
<td>Acute cholecystitis (n = 4)</td>
<td>Acute cholecystitis (n = 38)</td>
</tr>
<tr>
<td></td>
<td>Hepatic colic (n = 8)</td>
<td>Hepatic colic (n = 73)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Polyp (n = 1)</td>
</tr>
</tbody>
</table>

Table 2  Time course of liver tests in 12 patients with stones in the common bile duct.

<table>
<thead>
<tr>
<th>characteristic</th>
<th>2nd postoperative day</th>
<th>6th week</th>
<th>Preoperative endoscopic retrograde cholangiopancreatography (n = 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaline phosphatases (IU/L)</td>
<td>61 (56—98)</td>
<td>68 (53—121)</td>
<td>71 (55—126)</td>
</tr>
<tr>
<td>Gamma glutamyltransferase (IU/L)</td>
<td>61 (12—83)</td>
<td>48 (29—96)</td>
<td>53 (43—123)</td>
</tr>
<tr>
<td>Total bilirubin (μmol/L)</td>
<td>7 (5—16)</td>
<td>6 (5—13)</td>
<td>9 (5—12)</td>
</tr>
<tr>
<td>Serum lipase (IU/L)</td>
<td>38 (32—112)</td>
<td>41 (34—135)</td>
<td>43 (34—127)</td>
</tr>
</tbody>
</table>

Discussion

Excepting cases where the clinical situation enables prediction
of stones in the common bile before cholecystectomy, fortuitous discovery of a filling defect in the common duct

Figure 1  Postoperative cholangiogram, day 2.

Cholangiographie de contrôle au deuxième jour postopéra-
toire.
Fortuitous discovery of common bile duct stones

Principale.

than 10% of patients [20], such as severe acute pancreati-

disks of early complications, sometimes affecting more

operative stenosis of the common bile duct.

reported that more than 2% of the procedures led to post-

is often small, making choledochotomy a delicate task with

was 159 min; the time for extraction via choledochotomy

with transcystic extraction of a stone in the common duct

operative stenosis of the common bile duct. For Lauter et

may require conversion to laparotomy [16—18]. For Lauter et

necrosis or endoscopic extraction was avoided in 52% of patients. In

that series, there was no correlation between the size or

bile duct stones. They concluded that spontaneous clear-

quantitative clearance in 14 to 64% of patients depending on the

15 mm while other stones measuring 5 mm were still in

As also reported by Collins et al., we did not find any link

common duct at the sixth week.

In our series, we considered that the intraoperative

omine duct clearance was thus 26% and surgical exploration

or endoscopic extraction was avoided in 52% of patients. In

The alternative would be "systematic" endoscopic

during intraoperative cholangiography raises the question

of the appropriate management strategy. First an artifact

effect must be ruled out. Fortuitous discovery of a stone in

the common bile duct is reported in 4 to 6% of all cholecys-
tectomy procedures [5,11]. About 90,000 cholecystectomy

procedures are preformed annually in France [12] (about

400,000 in the United States [13]), mostly for symptomatic
gallstones with no sign predictive of lithiasis of the common
duct. If one considers that about half of the surgeons per-

formed an intraoperative cholangiography systematically and

that more than 5% of these procedures yield a fortuitous
diagnosis of a stone in the common duct, this situation would

occur more than 2000 times a year in France (10,000 in the

United States).

When a stone is discovered, surgical extraction dur-

ing the same procedure can be proposed, either via a

transcystic approach or by choledochotomy [14,15]. This

significantly lengthens the operative time, and when difficult,

may require conversion to laparotomy [16—18]. For Lauter et

Froines [18], the mean operative time for cholecystectomy

with transcystic extraction of a stone in the common duct

was 159 min; the time for extraction via choledochotomy

was 255 min. The caliber of a common duct with a stone

is often small, making choledochotomy a delicate task with

a high risk of postoperative stenosis. Nathanson et al. [19]

reported that more than 2% of the procedures led to post-

operative stenosis of the common bile duct.

The alternative would be "systematic" endoscopic

extraction. The main drawbacks of this option are the associ-

ated risks of early complications, sometimes affecting more

than 10% of patients [20], such as severe acute pancreati-
tis, reported in nearly 1% of patients [20,21]. Long-term

complications include reflux cholangitis with backflow con-
tamination of the bile and formation of pigment stones.

These late complications are observed in nearly 10% of

patients [22—24]. The endoscopic method is often per-

formed during a second operative phase requiring a second

general anesthesia and a longer hospital stay. Endoscopic

extraction, like surgical removal, is more difficult when the

common duct is small. These two empiric options do not

take into consideration the possibility of false positives [10]

and the fact that duct clearance can occur spontaneously

[5—8,11,25].

Our protocol was established following the work reported

by Collins et al. [5] who found that the cholangiogram

returned to normal in 52% of patients (24 of 46 patients)
after transcystic drainage for six weeks. These authors con-

sidered that spontaneous clearance was authentic in 12

patients, while for the 12 others (with normal cholangi-

ography on the second day), the transcystic intraoperative

cholangiography had yielded a false positive. The rate of

spontaneous clearance was thus 26% and surgical exploration

or endoscopic extraction was avoided in 52% of patients. In

that series, there was no correlation between the size or

number of stones and spontaneous clearance. The authors

observed spontaneous ductal clearance for stones measur-
ing 15 mm while other stones measuring 5 mm were still in

the common bile duct at the sixth week.

In our series, we considered that the intraoperative

opacity gave a false positive for the two patients whose

day-2 cholangiogram was normal [26,27]. This gave a false-

positive rate of 16.7%.

Our strategy allowed us to avoid surgical exploration of

the common bile duct in eight of 12 patients (66.7%), and

postoperative endoscopic stone extraction in six of 12 (50%).

As also reported by Collins et al., we did not find any link

between the size or number of stones and spontaneous clear-

ance.

Spontaneous clearance has been reported by many

authors in 16% to 75% of patients [6—8,11,25]. Hainsworth

et al. [25] compared the pre- and postoperative endoscopic

retrograde cholangiopancreatograms. In their postopera-

tive group, the rate of spontaneous clearance was 75% (8/12 patients). Ryberg et al. [7] studied patients who had

an abnormal cholangiogram who did not have to have an

exploration of the common bile duct. They found sponta-

neous clearance in 14 to 64% of patients depending on the

signs used to define an abnormal transcytic intraoperative

cholangiogram: absence of stone passage into the duode-

num, doubtful or uvulco image of intraductal lithiasis.

Tranter et Thompson [8] reported that spontaneous clear-

ance could be observed in patients with preoperative signs

predictive of bile duct stones. They analyzed the records of

1000 consecutive patients after cholecystectomy and found

that preoperatively, 532 had signs predictive of a stone in the

common duct. At the time of surgery, only 142 patients had

bile duct stones. They concluded that spontaneous clear-

ance had occurred in 390 patients (73% of the stones).

Elevated liver or pancreatic enzymes (poorly specific signs)

were used as preoperative signs suggestive of common bile

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In 1956, Fitzgibbons et al. [6] were the first to pro-

pose transcystic drainage for patients with a fortuitously

discovered lithiasis of the common bile duct, after observ-

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instituted transcystic drainage as a standard protocol and published the first prospective series [5,11].

In our clinical practice, we consider that the main objective for transcystic drainage is to avoid excessive pressure in the common bile duct. The transcystic drain can also be used for the control cholangiography. This is one of the most sensitive and most specific explorations available for the diagnosis of residual stones in the common bile duct [26]. It can easily be performed in an outpatient clinic.

Furthermore, if endoscopic extraction should be required, the transcystic drain facilitates the procedure by allowing transpapillary descent of the guidewire.

This protocol has some drawbacks related to the drain and the dressing as well as the need for good patient comprehension should an emergency maneuver be required.

The best duration for the drainage remains to be determined. We opted for six weeks for better comparison with earlier reports.

Conclusion

Most asymptomatic common bile duct stones have a favorable natural history. Fortuitous discovery during a cholecystectomy procedure should not lead to systematic surgical or endoscopic extraction. The exact characteristics of common bile duct lithiasis enabling this favorable course remain to be determined.

References