LAPAROSCOPIC CHOLECYSTECTOMY WITHOUT INTRAOPERATIVE CHOLANGIOGRAPHY: AUDIT OF LONG TERM RESULTS

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Running title: Laparoscopic cholecystectomy without intraoperative cholangiography

Abstract

There is no uniform consensus on the utility of routine intraoperative cholangiography (IOC) during laparoscopic cholecystectomy (LC). We present herein a ten-year retrospective audit of our cases of LC without IOC, performed by search of readmission cases through our electronic data base. Data regarding all patients subjected to LC at our Unit in the period January 1996 – December 2006 were obtained through our hospital data base system. Subsequently a query was made to ascertain if there were any readmissions to any of our city hospitals, up to December 2006. A total of 1321 patients underwent LC at our unit in the period 01/01/1996-31/12/2006. The median operating time for LC without IOC was 58 minutes (range 15 – 370 minutes). The median hospital stay was 2 days (range 1-30 days). Postoperative outcome was uneventful in 1250 patients (94.7%). There was no mortality. Grade I and II complications occurred in the remaining 71 patients. Patients were stratified by risk of common bile duct stones (BDS) according to clinical, ultrasonographic and serum chemistry data. Patients with suspected BDS underwent preoperative endoscopic retrograde cholangiopancreatography (ERCP) and BDS clearance (142 patients). No patient in our series of LC was readmitted to any of the city hospitals for biliary desease up to ten years after the operation. Our retrospective audit confirms the safety of LC without routine IOC and the rarity of readmissions for retained BDS, and supports the policy of selective IOC.

Introduction

There is no uniform consensus on the utility of routine intraoperative cholangiography (IOC) during laparoscopic cholecystectomy (LC). Most laparoscopic surgeons advocate selective use of IOC (1), while others insist on the need of routine IOC (2). The main reason to perform IOC would be one-time detection and treatment of asymptomatic bile duct stones (BDS). However,

recent studies suggest that asymptomatic BDS do not necessarily need removal, since they rarely cause biliary complications following LC (3). We present herein a retrospective ten-year audit of our cases of LC without IOC, performed by search of readmission cases through our electronic data base.

Patients and methods

Data regarding all patients subjected to LC at our unit in the period January 1996 -December 2006 were obtained through our hospital data base system. Almost all patients were operated on in elective setting, a part a few cases directly transferred from other Medical Departments. Direct admission through the emergency Department is not contemplated. Patients were stratified by risk of BDS by clinical, ultrasonographic and serum chemistry data. In case of BDS suspicion, preoperative Endoscopic retrograde cholangiopancreatography (ERCP) and BDS clearance were performed (142 patients). In the last three years, before ERCP, patients with no clear cut evidence of BDS underwent magnetic resonance cholangiography (MRC), to avoid unnecessary ERCP. Treatment algorithm is summarized in Fig. 1.

Patients were individualized through their fiscal code. Data included anagraphic details, main and accessory diagnoses, type of main procedure, operating time, associated operations, complications following operation, hospital stay. Subsequently a query was made to ascertain if there were any readmissions to any of our city hospitals, for any reason, up to December 2006. In case of readmission, clinical data were analyzed in detail to rule out residual BDS or other biliary complications (usually comprised in the 576 code according to the ICD-9-CM).

Results

A total of 1321 patients underwent LC at our unit in the period January 1996 – December 2006. The location of our Surgical Unit changed from Bellaria Hospital to Maggiore Hospital, always in Bologna, in November 2003, but data have been aggregated, since there has been no change in practice. There were 533 males, and 788 females. Age was 57.7 ± 15.5 (mean ± Standard Deviation), ranging from 15 to 90 years. Only 24 cases (9 males and 15 females) were operated on in emergency. All other operations were planned after referral from the outpatient clinic or from other Hospital Departments, since there is no direct admission from the Emergency Department to our Surgical Unit, and usually entered the day of surgery. The median operating time for LC without IOC was 58 minutes (range 15 – 370 minutes). Conversion rate was 2.1% (28 cases), mainly in the first years and in emergent cases. The median hospital stay was 2 days (range 1-30 days). Postoperative outcome was uneventful in 1250 patients (94.7%). There was no mortality. Grade I and II complications occurred in the remaining 71 patients (Table I). No patient in our series of LC was readmitted to any of the city hospitals for biliary desease up to ten years after the operation (mean follow

up was 4.8 years, minimum follow up 13 months). In the same period, only eight patients of our series were found to be readmitted to any of the city hospitals, 4 for cardiac problems, one each respectively for esophagitis, diverticulitis, ventral hernia and trauma.

Discussion

BDS are suspected in 8% to 20% of patients undergoing LC (4-6). In patients with symptomatic BDS, mainly for jaundice of biliary pancreatitis, standard treatment at our institution consists of ERCP and stone extraction, followed by LC (Fig. 1). Currently most patients with biliary problems are routinely admitted at first to the Gastroenterology Unit, were diagnosis and endoscopic treatment is performed, and only subsequently sent to the surgeon for completion LC. In asymptomatic patients, the natural history of BDS discovered by IOC during LC is not completely clear (3, 7), but available studies suggest that biliary complications are rare, and BDS incidentally discovered at LC may not need removal (1, 8).

Our retrospective survey was undertaken with the aim to further clarify the natural history of asymptomatic BDS eventually undiscovered at LC, routinely performed without IOC at our Unit. Admittedly, our study has serious limitations, since we restricted our search to readmissions to our city hospitals, after a maximum of ten years from the operation (Mean follow up 4.8 years). Moreover, data may be inaccurate due to incorrect coding. However, most patients undergoing LC at our institution live in the surrounding area, and would most probably be directed to our institution, or to another hospital of the same city, in case of biliary complications following LC. On the other hand, a strict follow up of so a big number of patients for a benign disease like cholelithiasis would be unpractical, and the number of patients lost at follow up would probably be too big to obtain meaningful data. This retrospective study adds evidence to our current policy of selective use of IOC. Proponents of routine IOC quote its utility in detecting asymptomatic BDS, in avoiding ductal injuries during LC, and for staff training (9). However, the mean false-positive rate of IOC varies from 3 to 19% (10), mainly due to technical errors. Moreover, retained BDS are rarely symptomatic in the long term, and one third of these stones pass spontaneously within 6 weeks of the initial LC (8). As far as ductal injuries are concerned, they often occur early in the dissection, before performance of IOC (1). IOC may be misinterpreted or read improperly, and some time lead to unnecessary laparotomies and avoidable ductal injuries. The practice of routine IOC is more time consuming and adds significant additional costs (11).

In conclusion, our retrospective audit confirms the safety of LC without routine IOC and the rarity of readmissions for retained BDS, already registered in previous long term audits (12), and supports the policy of selective IOC.

Preoperative ERCP after screening for BDS proves effective, and gives the patient the benefit of minimally invasive surgery.

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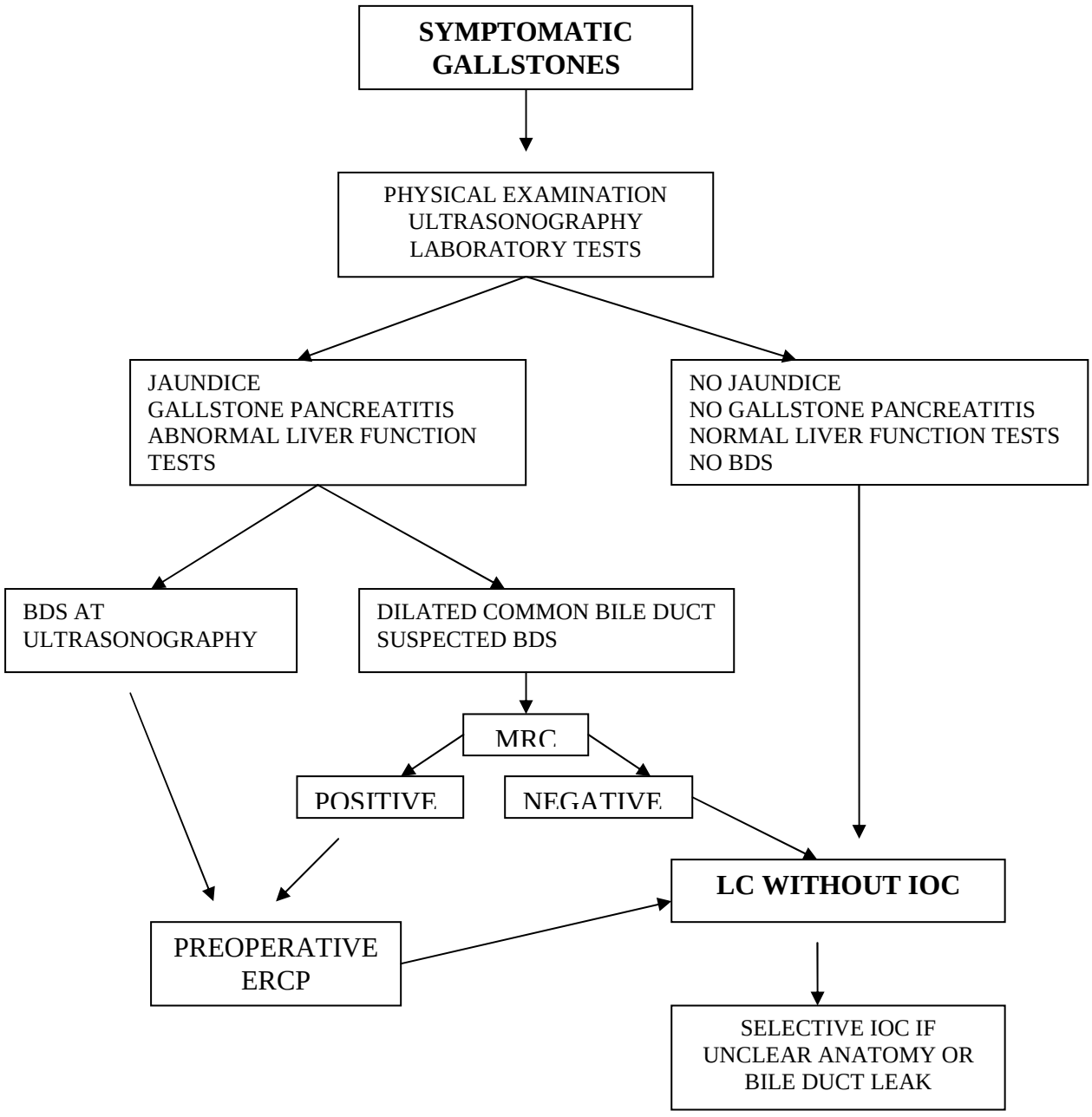

Figure 1. Treatment algorithm for patients with symptomatic gallstones at our institution.
BDS=bile duct stones; LC= laparoscopic cholecystectomy; IOC= Intraoperative cholangiography; MRC: Magnetic Resonance Cholangiography.

Table I. Complications following Laparoscopic Cholecystectomy in 1321 patients operated on between January 1996 and December 2006

COMPLICATION	**Number**
Grade I	
Wound Infection	8
Urinary retention	8
Fever	6
Pulmonary Atelectasis	6
Grade II	
Conversion for intraoperative intestinal perforation	2
Subhepatic Hematoma	18
Bleeding	14
Bile leak	9

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