

THE CONVERSION TO OPEN SURGERY IN LAPAROSCOPIC CHOLECYSTECTOMY**I. Slavu², V. Braga², L. Alecu¹**¹General Surgery Clinic, “Prof. Dr. A. Ionescu” Emergency Clinical Hospital, Bucharest Romania²The University of Medicine and Pharmacy “Carol Davila”, Bucharest, Romania

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Abstract

After more than 20 years from the beginning of laparoscopic surgery, laparoscopic cholecystectomy still holds a conversion rate of 5.1 % in the specialty literature. We have conducted a retrospective study based on the experience of the clinical unit of General Surgery within “Prof. Dr. A. Ionescu” Emergency Clinical Hospital, between 1997 and 2013. A number of 2,309 laparoscopic cholecystectomies were performed. The average age of the group was 47.3 years. Conversion was performed to a number of 58 patients (2.51%), out of which 74.13% women (no. = 43) and 26% men (no. 15). The average age of the patients to whom the conversion was performed was 57. Conversion to open cholecystectomy was more frequent in patients over 60 (no. 38). The main preoperative diagnosis in converted patients was acute lithiasic cholecystitis. Laparoscopic cholecystectomy is a safe method with optimal results, being considered the “gold standard” in the treatment of bladder lithiasis. Conversion to open surgery is an expression of the surgeon’s experience and wisdom.

Keywords: *laparoscopic surgery, cholecystectomy*

Introduction

In 1985, Prof. Erich Mühe, M.D., PhD, performed the first laparoscopic cholecystectomy in Germany, and in 1987 Mouret upgraded the method by means of the four trocars [2]. In 1990 laparoscopic surgery was performed in approximately 10% of all cases of cholecystectomy, while the ratio reaches 80% in the next five years. Thus, laparoscopic cholecystectomy became the *gold standard* in the surgical treatment of bladder lithiasis [3].

The percentage of conversion to open surgery ranges between 5 and 10% [4]. Some surgeon-related factors have been described: experience, dexterity. There are also factors

related to the patient and pathology: sex, age, BMI, history of abdominal surgery, choledochal lithiasis. Together they can lead to a laparoscopic approach of the surgery or to conversion to open surgery. The intraoperative complications of laparoscopic cholecystectomy can be either related to the surgical approach (vascular lesions, parietal lesions), to the pneumoperitoneum (gas embolism, cardiac complications) or they can be specific to the intervention: hemorrhage and lesions of the main bile ducts [5].

The most frequent cause of conversion illustrated in the literature is the difficult dissection of the anatomical structures of the Calot’s triangle, a thing that we have noticed and underlined [6]. The intraoperative lesions of

the main bile ducts appear in literature at a top value of 1.3% of the interventions, the great majority of which require conversion to open surgery [7].

The purpose of this paper is to identify the rate of conversion to open surgery in case of laparoscopic cholecystectomy and also the identification of the factors that lead to conversion.

Material and Method

We have retrospectively analyzed 2,309 cases of cholecystectomy performed between 1997 and 2013 at the General Surgery Clinic within “Prof. Dr. A. Ionescu” Emergency Clinical Hospital. We have retrospectively gathered data from the patients’ observation charts, surgical logs and hystopathological reports. The analyzed data referred to age, sex, preoperative diagnosis, intraoperative incidents, the number of conversions and also the type of interventions associated with the laparoscopic surgical procedure. The data were processed by means of Microsoft Excel 2007.

The operative technique: The standard “four trocars” Anglo-Saxon technique was used in all cases. The pneumoperitoneum was instituted by means of the closed technique with the Veress needle in case the patients have never undergone previous surgical abdominal interventions, or open for those with personal history of abdominal surgery. All patients received compression stockings to prevent any embolic accident. Low molecular weight heparin was administered subcutaneously to patients prior to surgery, and it continued to be administered until discharge. Three doses of third generation cephalosporin were administered perioperatively and prophylactically to patients.

Results

A number of 2,309 laparoscopic cholecystectomies were performed for 16 years (1997-2013), out of which 58 of them (2.51%) required conversion. An average figure of 144 cases were performed per year, with a maximum in 2010 (no. = 250). From this group,

24% were men and 76% women. The average age was 47.3 (18-73 years). (Figure 1)

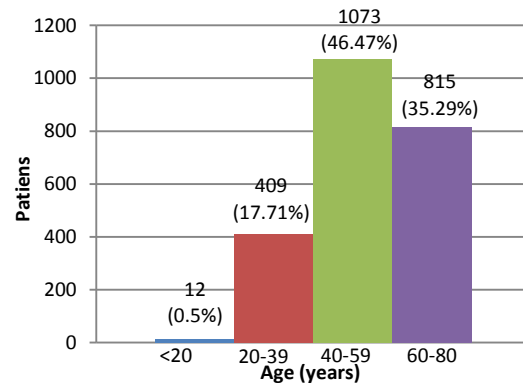


Figure 1 – Patients’ distribution based on age intervals

The preoperative diagnoses were: 1. Acute cholecystitis: 45.99% (no. = 1,062) out of which acute lithiasic cholecystitis 93.94% (no. = 998) and acute alithiasic cholecystitis 6.06% (no. = 64) (Figure 2); 2.chronic cholecystitis: 54.01% (no. = 1,247) out of which chronic lithiasic cholecystitis 85% (no. = 1,056), chronic alithiasic cholecystitis 9% (no. = 112) and chronic sclero-atrophic cholecystitis 6% (no. = 75) (Figure 3).

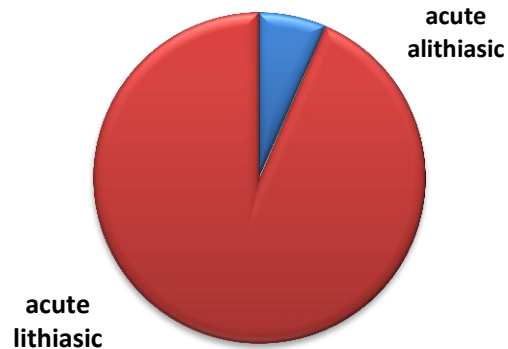


Figure 2 – The distribution of patients with acute lithiasic and alithiasic cholecystitis

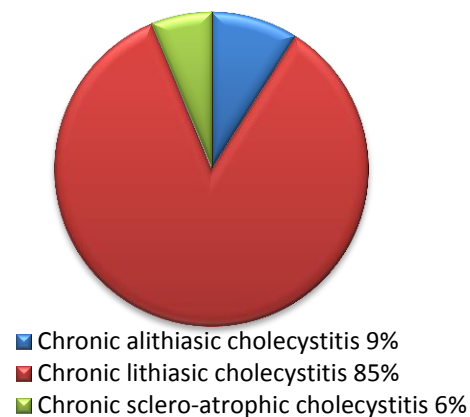


Figure 3 - The distribution of anatomical-pathological forms of chronic cholecystitis

In 89% of the cases the preferred surgical technique was retrograde cholecystectomy, anterograde cholecystectomy in 6% of the cases, and bipolar in 5% of the cases. (Figure 4). We need to specify that the choice of an optimal surgical technique was determined intraoperatively by the local lesional context.

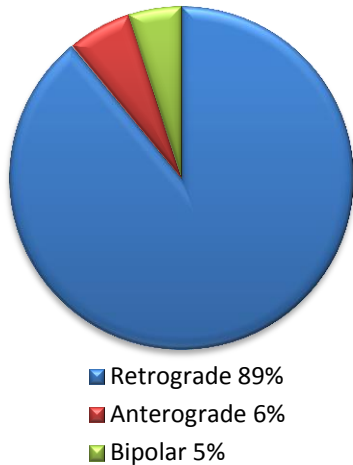


Figure 4 – The distribution of the surgical techniques used in laparoscopic cholecystectomy

A number of 4 cases were concluded by means of robotic surgery. The Da Vinci system grants the surgeon a series of advantages such as increased visibility, eliminates hand tremor, and ensures more comfort. Its elective use is blocked by the high costs of operation. A surgical intervention using the Da Vinci robotic system increases the average costs of the intervention with 1,200\$, according to Gabriel I. Barbash's study, published in New England Journal of Medicine in 2010.

There were 15 intraoperative incidents: 1. Hemorrhage no. = 10 (out of which 7 required conversion, and 3 were concluded laparoscopically in the same surgical intervention); 2. Main bile duct lesions no. of cases = 5 (0.21%). All the incidents were recognized intraoperatively. Two of the cases were concluded laparoscopically by inserting an external biliary Kehr drainage, while 3 of the patients required conversion to open surgery. Three laparoscopic interventions (0.12%) were necessary, out of which one for the hemoperitoneum and two for the choleperitoneum.

The factors that determined the conversion of the 58 cases to open surgery were as follows: unattainable dissection of the hepatic pedicle no. = 22 (38%), adherential processes no. = 13

(22%), hepatic pediculitis no. = 11 (19%), hemorrhage no. = 7 (12%), iatrogenic lesions of the primary bile ducts no. = 5 (9%) (Figure 5).

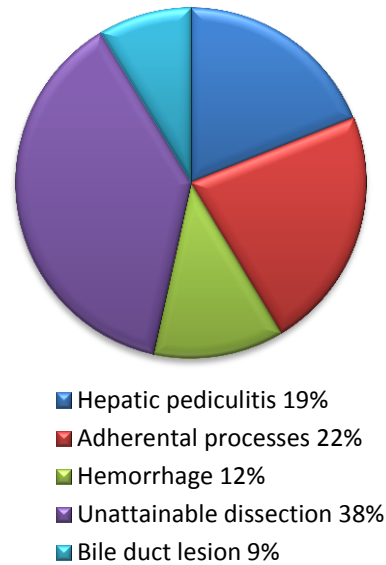


Figure 5 – The distribution of the causes of conversion

Out of the 58 patients who required conversion 74.13% (no. = 43) were female and 25,87% (no. = 15) were male.

The average age of the group was 57. The conversion to open surgery was more frequently required in patients over 60, compared to those under 60. The main preoperative diagnostic was acute lithiasic cholecystitis (no. = 34) for those patients who required conversion to open surgery.

In 49 of the cases, laparoscopic cholecystectomy was accompanied by other associated interventions (Table 1).

Appendectomy	4
Hysterectomy	4
Hepatic biopsy	14
Nissen fundoplication	20
Ovariectomy	7

Table 1 - Laparoscopic interventions associated with cholecystectomy

Discussions

Although primary extrahepatic bile duct injuries are more frequently encountered in case of laparoscopic cholecystectomy rather than in case of open cholecystectomy, the postoperative recovery of the patients who had undergone

such surgery is superior to the recovery after an open surgery due to the shorter hospital stay, lower morbidity, lower hospital costs, faster recovery and superior esthetic aspect (“key hole surgery”) [7].

A series of patient-related factors may influence the rate of conversion; the data resulted in the study can be correlated to those described in the literature. Therefore, the literature reveals an increased conversion rate in the elder patient, figure which reaches 20% in case of acute biliary pathology [8].

Acute cholecystitis has a higher rate of conversion thorough the inflammatory processes of pericholecystitis and pediculitis, which alter the local anatomical structures and decreases the chances of identifying correctly the cystic duct, the cystic artery in Calot’s triangle or the primary bile duct. Moreover, the cleavage plane of the cholecyst of the hepatic bed is lost due to inflammatory changes, if the time period from the onset of the acute process to the moment of surgery is greater than 7 days, thus increasing the risk of injury to the hepatic parenchyma. Very useful in order to correctly identify the local anatomy are the intraoperative exploratory methods (ultrasonography, cholangiography and cholangiofibroscopy).

Intraoperative hemorrhaging resulting from the cystic artery, the hepatic artery, the cystic fossate, the hepatic parenchyma may be the cause of conversion and require open hemostasis. In the series presented, there were 10 such complications, out of which 3 required conversions (representing 0.12% of all conversion cases). In literature, the conversion rate for such a complication revolves around 0.27% [9].

Injury to the primary bile ducts is the most feared complication in laparoscopic cholecystectomy. Its recognition is of great importance in order to be solved either by means of intraoperative laparoscopy or through conversion. In our series, we identified a number of 5 such iatrogenic injuries of the primary bile duct (0.21%), all of them being intraoperatively recognized. Three of the cases required conversion. Literature reports an average incidence of 0.5%, figures which may range from 0.35% to 1.3%, according to the surgeon’s experience. A higher incidence was identified in laparoscopic cholecystectomy

compared to the fact reported after open cholecystectomy, an average value which is around 0.2 % [10-12].

Conclusions

- Laparoscopic cholecystectomy represents nowadays the gold standard in the treatment of bladder lithiasis.

- Laparoscopic cholecystectomy has a low rate of conversion, whose value decreases as the surgical team gathers more experience.

- The most frequent causes of conversion are: unattainable dissection due to pericholecystitis and hepatic pediculitis secondary to acute underhepatic inflammation.

- Conversion to open surgery is a wise decision on the part of the surgeon, when the limits of laparoscopic surgery have been exceeded.

- The possibility to solve intraoperative incidents through the laparoscopic method due to the experience of the surgical team and available equipment represents another way to diminish the conversion rate.

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