

## Predictive factors of difficult procedure in octogenarians undergoing elective laparoscopic cholecystectomy: a single center experience

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**SUMMARY: Predictive factors of difficult procedure in octogenarians undergoing elective laparoscopic cholecystectomy: a single center experience.**

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*Aim. To assess the feasibility and safety of laparoscopic cholecystectomy (LC) in very elderly patients with particular attention to the predictive factors of difficulty.*

*Patients and methods. All patients aged  $\geq 80$  undergoing elective LC for lithiasis at our institution since 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2015 were included in the study. Exclusion criteria were: a) acute cholecystitis; b) biliary pancreatitis; c) biliary tract neoplasms; d)*

*urgent procedure. Pre-, intra- and postoperative data were recorded.*

*Results. During the study period, we performed 72 LC and we enrolled 17 patients aged  $\geq 80$  with a M:F = 5:12. Of these, 10 patients had a "difficult" cholecystectomy. In seven cases an intraoperative cholangiography (IOC) was performed. Postoperative course was regular but in two patients we had an Oddian spasm in 1<sup>st</sup> postoperative day. Female sex ( $p=0.03$ ) and preoperative high level of serum amylase ( $p=0.02$ ) were significantly associated to difficult cholecystectomy in elderly patients.*

*Conclusion. LC in octogenarians is feasible and safe. However, sex and serum amylase can help the surgeon to predict a more difficult procedure in elective LC. In this group of patients an approach based on the individual risk is desirable and the patient could be referred to a multidisciplinary approach.*

KEY WORDS: Elderly - Cholecystectomy - Laparoscopy.

### Introduction

Laparoscopic cholecystectomy (LC) is the gold standard procedure for management of symptomatic gallstone disease. The incidence of the disease increases with age and nowadays surgeons have often to face with gallbladder lithiasis in very old patients. Furthermore, approximately 2-12% of LC has to be converted to an open procedure due to various difficulties (1).

The preoperative prediction of a "difficult" procedure can be very important in this setting and can help the surgeon in being better prepared for the intra-operative challenges to give a tailored approach to older patients.

### Patients and methods

All patients aged  $\geq 80$  undergoing elective LC for lithiasis at our institution since 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2015 were included in the study. Exclusion criteria were: a) acute cholecystitis; b) biliary pancreatitis; c) biliary tract neoplasms; d) urgent procedure. Pre-, intra- and postoperative data were recorded.

**Preoperative** data recorded were:

- Clinical:* age, sex, BMI, diabetes, assumption of oral anticoagulation, episodes of abdominal pain in the last week and prior abdominal surgery.
- Laboratory test:* liver enzymes (AST/ALT), amylase (AMS) and alkaline phosphatase (ALP).
- Echographic parameters:* gallbladder wall thickness  $> 4$  mm, scleroatrophic gallbladder, dilatation of biliary duct  $> 6$  mm, impacted calculus, single calculus  $> 1.5$  cm.

The following **intra-operative** parameters were recorded for all the patients undergoing LC:

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- Time taken for surgery
- Bile/stone spillage
- Necessity of intraoperative cholangiography (IOC)
- Conversion to open cholecystectomy
- Bleeding requiring hemostatic sponge

If one or more of these parameters were present the procedure was considered as difficult. All cases were performed by a single surgeon using CO<sub>2</sub> pneumoperitoneum with 6-8 mmHg pressure and using Hasson procedure with 3-port technique. The timing was noted from the first port site incision till the last ports closure.

All patients were administered an antibiotic prophylaxis with Ceftriaxone 2 gr i.v. 60 minutes before the procedure and Paracetamol 1 gr i.v. every eight hours in the first postoperative day.

The following study was approved by Institutional Ethical Committee with informed consent from participants.

### Statistical analysis

Continuous normally distributed data were analyzed using Student's t-test. Proportions were compared by Chi-square test or Fischer exact test. For all comparisons, a probability of 5% was considered as significant.

## Results

Since 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2015 we performed 72 LC. Of these, 17 patients were aged ≥ 80 (80 - 85), with a M/F ratio of 5/12. Among these procedures, we registered 10 "difficult" LC and seven easy LC.

On the basis of the intra-operative parameters previously described, in two cases LC lasted more than 90 minutes; in two patients there was a bleeding requiring hemostatic sponge and postoperative drainage; in seven cases an IOC was performed for unclear anatomy of the biliary tree. Conversion rate was 0% (Table 1).

Six patients were diabetic (35%) and 29% assumed oral anticoagulation. In three patient we had a BMI > 25 Kg/m<sup>2</sup>. All patients undergoing LC suffered biliary colic and six patients (35%) had abdominal pain in the last two weeks.

TABLE 1 - CRITERIA FOR DIFFICULT LC.

Intraoperative data	Patients (%)
Surgery duration > 90 min	2 (12%)
Laparotomic conversion	0
Intraoperative colangiography	7 (41%)
Bile spillage	0
Bleeding requiring hemostatic sponge	2 (12%)

Abdominal ultrasound showed parietal gallbladder thickening > 4 mm in 2 patients (12%), impacted calculus at infundibulum in 4 patients (23%) and single calculus > 1.5 cm in six patients (35%).

All preoperative data are listed in Table 2.

Postoperative course in elderly patients was regular but in two patients undergoing IOC we had an Oddian spasm in 1<sup>st</sup> postoperative day regressed with administration of antispastic drugs.

Statistical analysis of results showed that only female sex (p = 0.03) and preoperative amylase level > 100 U/ml (p = 0.02) are significantly associated with difficult procedure in octogenarians patients (Table 3).

TABLE 2 - PREOPERATIVE DATA.

	N (%)
Female	12 (70%)
Male	5 (30%)
Diabetes	6 (35%)
Oral anticoagulation	5 (29%)
BMI > 25	3 (17%)
Previous abdominal surgery	9 (53%)
Abdominal pain	6 (35%)
Elevated transaminase	2 (12%)
Elevated amylase	3 (17%)
Elevated alkaline phosphatase	4(23%)
Gallbladder wall thickening > 4 mm	2 (12%)
Scleroatrophic gallbladder	0
Impacted calculus	4 (23%)
Biliary tree > 6 mm	0
Single calculus >1.5 cm	6 (35%)

TABLE 3 - STATISTICAL ANALYSIS.

	Difficult, n	Easy, n	p
Female	9	3	0.03
Male	1	4	0.61
Diabetes	4	2	0.62
Oral anticoagulant	3	2	0.97
BMI > 25	1	2	0.32
Previous abdominal surgery	7	2	0.09
Abdominal pain	3	3	0.58
Elevated transaminase	1	1	0.78
Elevated Amylase	3	0	0.02
Elevated Alcaline posphatase	3	1	0.4
Gallbladder wall thickening > 4 mm	1	1	0.78
Scleroatrophic gallbladder	0	0	/
Impacted calculus	2	2	0.68
Biliary tree > 6 mm	0	0	/
Single calculus >1.5 cm	5	1	0.12

## Discussion

Laparoscopic cholecystectomy is one of the most commonly performed surgical procedure worldwide and is considered the gold standard for the treatment of gallbladder lithiasis.

The incidence of the lithiasis increases with age and often the surgeon has to face with difficult procedures in elderly patients. In this subgroup of patients the prediction of the risk of difficult procedure could be very important for the surgeon in the setting of a tailored approach.

Age is a risk factor for difficult gallbladder surgery (2) and in our series we analyzed octogenarian patients: however, in our study we found no significant correlation between age and the difficult level of surgery. This could be because of the small sample size of the study population (n=17).

In previous studies, male sex has been described to be associated with difficult LC (3). In the present study, there were 5 males and 12 females. Of 5 males, 1 had a difficult surgery, while 9 female patients on 12 had a difficult LC (p= 0.03).

Obese patients may have a difficult LC due to various factors (4). Port placement and dissection at the Calot's triangle is also technically difficult due to the excessive intraperitoneal fat and difficulty in the manipulation of instruments through an excessively thick abdominal wall. In our study, we found no correlation between BMI and difficult level of surgery (p=0.32).

Previous upper abdominal surgery may cause the formation of intraperitoneal adhesions that may lead to in-

creased probability of injury and bleeding while placement of umbilical port (5). It was found to be not statistically significant factor in our study (p=0.09).

Recent abdominal pain due to lithiasis also was not statistically significant factor in our study (p=0.58), however patients with preoperative level of serum AMS > 100 U/ml had difficult LC (p=0.02). The association was not significant if GOT/GPT or ALP serum levels were elevated.

In our study, stone impacted at the neck of GB though poses some technical problems, because of distension of GB (6) was not associated with a difficult procedure (p= 0.68). Also increased GB wall thickness > 4mm and single calculus > 1,5 cm were not associated with difficult LC (p= 0.78 and p=0.12, respectively).

However better randomization of the patients and a larger sample would have allowed us to extrapolate the results into the general population.

Finally another important factor that plays a role in the time requirement for the procedure is the surgical expertise of the operating surgeon (7).

## Conclusions

In very elderly patients a tailored approach on the basis of the individual risk is necessary.

Female sex and elevated preoperative AMS were the only factors found statistically significant to predict difficult LC in octogenarians.

Sample size is small and further studies are needed to validate our observations.

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