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Elective and emergency laparoscopic cholecystectomy in the elderly: our experience

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Abstract

Background: We aimed to analyze outcomes of early and delayed laparoscopic cholecystectomy in the elderly in our General Surgery Division.

Methods: We analyzed 114 LC performed from the 1st of January 2008 to the 31st of December 2012 in our General Surgery division: 67 LC were performed for gallbladder stones and 47 for acute cholecystitis.

Results and discussion: Comparison between Ordinary and Emergency groups showed that drain placement and post-operative hospital stay were significatively different. There were no significative differences between Early Laparoscopic Emergency Cholecystectomy (E-ELC) and Delayed Laparoscopic Emergency Cholecystectomy (D-ELC). There weren't any differences about Team's evaluation.

Conclusion: We consider LC a safe and effective treatment for cholelitiasis and acute cholecystitis in Ordinary and Emergency setting, also in the elderly. We also demonstrate that, in our experience, LC for AC is feasible as well.

Background

Laparoscopic cholecystectomy (LC) represents the gold standard treatment for cholelithiasis.

Its application gradually extended to acute cholecystitis (AC) also in the elderly. We aimed to compare outcomes of the University Section of General Surgery in "San Luigi Gonzaga" Hospital of Orbassano (Turin) with literature, evaluating timing and technique of early or delayed laparoscopic cholecystectomy in the management of acute cholecystitis in elderly patients.

Methods

From the 1st of January 2008 to the 31st of December 2012, 114 LC were performed at the University Section of General Surgery in elderly patients (Age > 65 yrs): 67 for gallbladder stones and 47 for acute cholecystitis. The diagnosis of cholecystitis and gallbladder stones was performed basing on general conditions, physical examination, laboratory exams, radiologic findings and sepsis score. For the study we also considered: total hospital stay, time before and after surgery, duration and kind of operation, conversion to open procedure, drain and final pathological results. We excluded 29 patients from the study (17 for choledocolytiasis associated and 12 for hospitalisation > 20 days). We didn't exclude ASA III and ASA IV patients: in these patients (27,4%, 17 ASA III and 4 ASA IV) we used abdominal pressure not superior of 10 mmHg [1]. We included in the study 85 elderly patients (49 M, 36 F): Ordinary Cholecystectomy was peformed in 45 cases (Ordinary Group) and Emergency Cholecystectomy in 40 cases (Emergency Group). This last group was further divided in two groups [2-4]: E-ELC (31 patients with surgery performed before 72 hours from starting of the symptoms) and D-ELC, (9 patients with surgery performed after 72 hours until 9 day). The experience of the first operator was also considered a contributing factor. Basing on this factor, and considering laparoscopic learning curves as described in literature (29-40), we identified three subgroups of surgery teams (Table 1) in order to evaluate our results [5-11].

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Table 1 Definitions of team according to the experience of the lead surgeon

Team 1	More than 100 laparoscopic cholecistectomy and more than 100 other laparoscopic operations.
Team 2	Less than 100 laparoscopic cholecistectomy and less than 100 other laparoscopic operations.
Team 3	Surgeons in learning curve progression or Resident with expert Surgeon supervisor

Statistical proportions related to the analyzed dichotomic variables, for both E-ELC and D-ELC (gender distribution in different patient groups, number of post-operative complications, conversion rate, number of drains, number of other related surgeries, presence of fever, wall thickening, effusion amount, gallbladder distension and calculosis type) were compared using Chi-square test and Fisher's exact test. Continuous variables like age distribution, post-operative hospital stay time, surgery duration and several haematochemical characteristics (WBC, CRP) were expressed as average (range) and analyzed using the Mann-Witney U test. Patient distribution according to different surgical teams was confirmed. All statistical analyses were performed using R software (*version 2.6.2*), and a p value of less than 0.01 was considered indicative of statistical significance.

Results and discussion

In our experience, the comparison between Ordinary and Emergency Group was no statistically significant about blood test values and ultrasonographic evidence (Table 2).

We analyzed E-ELC and D-ELC data without finding any statistically significant difference in the elderly, except for the full hospital stay duration, which was longer for D-ELC patients (Table 3). Operation time, conversion rate, and complications did not demonstrate any significant difference between the two groups. Comparison of success rates achieved by different surgeons yielded the same results, regardless of their levels of experience (Table 4). Patients can be operated after a time interval of 73 hours and up to 9 days, and receive the same benefits that would have been obtained from an earlier operation.

Table 2 Statistical analysis based on the comparison of Ordinary vs DEA Groups

	Ordinary Group	Emergency Group	P Value
Operation time (min)	75,5 (40-220)	90 (28-200)	0,1874
PO hospital stay (days)	2 (1-10)	3 (2-12)	0,002313
Conversion rate	6,7%	2%	0,3869
Complications	8,5%	2%	0,2352
Drains	16,7%	51%	0,0003
Associated operations	13,3%	12,8%	0,998
Cancer	3%	0	-

Table 3 Statistical analysis based on the comparison of E-DLC and D-DLC Groups

	Early-ELC	Delayed-ELC	P Value
WBC	11,05 (3,73-28,8)	9,05 (2,23-15,6)	0,03264
PCR	1,39 (0,04-45)	0,66 (0,08-23,23)	0,1672
Temperature	14%	2 (7%)	0,5281
Thickened wall	57.4%	13 (48%)	0,4
Pericholecystic fluid	17%	2 (7.4%)	0,25
Distended gallbladder	43.4%	12 (44.4%)	0,998
Operation time (min)	90 (36-330)	85 (28-195)	0,1554
PO hospital stay (days)	3 (2-15)	3 (2-8)	0,6551
Total hospital stay	4 (2-16)	10 (4-16)	p < 0,01
Tasso di conversione	5%	0%	0,59
Complications	5%	0%	0,59
Drains	36%	26%	0,3752
Operations associated	8%	15%	0,2353
Cancer	1,6%	0%	0,998

Conclusions

In agreement with literature [8-10], we consider LC a safe and effective treatment for AC also in the elderly. This study demonstrates that in our experience LC for AC is feasible as well. The learning curve of this procedure is feasible [11,12]. We also believe that, whenever possible, early LC is to be preferred, above all for the significantly shortened total hospital stay. Nevertheless, the retrospective analysis of our case study, even with a smaller sample for delayed LC patients, showed that elderly patients can be operated with delayed approach and still benefit from the same advantages that would be obtained with an early operation [12-19]. In our experience, according to literature, laparoscopic cholecystectomy is a secure procedure to be performed [20-24]. We consider surgery approach

Table 4 Statistical analysis based on the Team

	Team 1-Team 2	Team 1-Team 3	Team 2-Team 3
Operation time (min)	0,6936	0,6089	0,2759
PO hospital stay (days)	0,3159	0,02131	0,09583
Total hospital stay	0,9362	0,004337	0,004981
Conversion rate	0,1553	0,6677	0,3896
Complications	0,3823	0,998	0,998

more difficult in the elderly in some cases [25] but we also considered laparoscopic approach is, in general, a safe and feasible technique in acute pathology and a safe approach also in the elderly [26].

Competing interests
The authors declare that they have no competing interests.

Authors' contributions
AGF: conception and design, interpretration of data, given final approval of the version to be published.
SE: conception and design, interpretration of data, given final approval of the version to be published.
MS: acquisition of data, drafting the manuscript, given final approval of the version to be published.
AF: acquisition of data, drafting the manuscript, given final approval of the version to be published.
SC: acquisition of data, drafting the manuscript, given the final approval of the version to be published.
GP: acquisition of data, drafting the manuscript, given the final approval of the version to be published.
SM: critical revision, interpretation of data, given final approval of the version to be published
VM: critical revision, interpretation of data, given final approval of the version to be published

Declarations
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