

ACUTE CHOLECYSTITIS. LAPAROSCOPIC CHOLECYSTECTOMY VERSUS OPEN CHOLECYSTECTOMY

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REZUMAT

Obiective: Evaluarea din punct de vedere clinic și economic a cazurilor abordate laparoscopic comparativ cu cele tratate prin chirurgie deschisă și tragerea unor concluzii asupra eficienței și rentabilității celor două proceduri.

Rezultate: Majoritatea procedurilor laparoscopice au fost efectuate prin tehnica retrogradă. Durata medie a terapiei cu antialgice a fost semnificativ mai mare la pacienții operați prin colecistectomie clasică decât la cei operați laparoscopic. S-au administrat antibiotice la 36 de pacienți din grupul tratat laparoscopic, în timp ce toți pacienții operați deschis au făcut antibioterapie. Ileusul postoperator a durat în medie 1,85 zile la pacienții cu colecistectomie laparoscopică, față de 2,91 zile la pacienții cu chirurgie clasică. Durata medie de spitalizare a fost semnificativ mai redusă ($p=0,05$) la pacienții operați laparoscopic față de cei operați deschis.

Concluzii: Durata sindromului algic postoperator, a terapiei antialgice și a ileusului postoperator au fost semnificativ mai scăzute la pacienții tratați laparoscopic comparativ cu cei operați deschis. Nu s-au înregistrat diferențe semnificative în ceea ce privește complicațiile postoperatorii. Pentru a scădea rata de conversie la chirurgie deschisă este recomandat să se efectueze colecistectomia laparoscopică în primele 96 de ore de la debutul colecistitei, deoarece modificările morfologice locale nu sunt încă bine definite. Beneficiul real al procedurii laparoscopice rezidă din scurtarea perioadei de spitalizare, precum și din costurile mai scăzute ale medicației postoperatorii și din reintegrarea socială și profesională mai rapidă.

Cuvinte cheie: colecistectomie laparoscopică, colecistită acută, colecistectomie deschisă.

ABSTRACT

Objectives: To evaluate from a clinical and economical point of view the postoperative evolution of the cases with a laparoscopic approach compared to those treated by open surgery and to state conclusions on the efficiency and rentability of the two procedures.

Material and Method: The study included 81 de patients diagnosed with acute cholecystitis. The patients were distributed in two groups, one with a laparoscopic approach and the other with open surgery. The comparing evaluation criteria were: duration of antialgic and antibiotic therapy, duration of postoperative ileus, postoperative hospitalization, intraoperative incidents, immediate postoperative complications and the cost of postoperative medication and hospitalization. The data obtained was processed according to the algorithm of the Student and ANOVA test.

Results: The majority of laparoscopic procedures were performed by retrograde technique. The average duration of antialgic therapy is significantly higher in patients with open cholecystectomy than in the ones with laparoscopic approach. Antibiotics were given in 36 patients of the laparoscopic group, whereas all patients of the open surgical group received antibiotics. The postoperative ileus lasted 1.85 days in the patients with laparoscopic cholecystectomy, compared to 2.91 days in the ones with conventional surgery. The average hospitalization period was significantly lower ($p < 0.05$, Student test) in patients with laparoscopic surgery, compared to the other group.

Conclusions: The duration of the postoperative algic syndrome, the antialgic therapy and the postoperative ileus was significantly shortened in patients with laparoscopic treatment comparing to the patients with open approach. There were no significant differences regarding the postoperative complications between laparoscopic and open cholecystectomy. To decrease the risk of conversion, it is recommended to perform the cholecystectomy during the first 96 hrs after the onset, because the local morphological modifications are not yet defined. The real benefit of the laparoscopic procedure consists in shortened hospitalization period, as well as in the decreased cost of the postoperative medication and early social and professional reintegration.

Key Words: laparoscopic cholecystectomy, acute cholecystitis, open cholecystectomy.

INTRODUCTION AND OBJECTIVES

Acute cholecystitis (AC) implies surgical treatment, being a severe complication which occurs in 92% is associated to lithiasis. The elective treatment method was open cholecystectomy, the laparoscopic cholecystectomy being only an alternative treatment

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method. During the last 5-6 years, laparoscopic cholecystectomy has been continuously promoted in opposition to the conventional one, which represents the modern alternative for the treatment of acute complicated cholecystitis.

Laparoscopic cholecystectomy is considered a feasible method in the treatment of AC; it is associated to an increased conversion rate due to local anatomical modification determined by the inflammatory process and the experience of the surgeon.^{1,2}

We aimed to evaluate from a clinical and economical point of view the postoperative evolution of the cases treated by laparoscopy compared to the ones referred to open surgery and to state a few conclusions related to the efficiency and profitability of the two procedures.

In a retrospective study performed in the Surgical Clinic 3 of Cluj-Napoca, we selected 40 laparoscopic cholecystectomies and 41 open cholecystectomies for AC. We monitored the duration of the postoperative hospitalization, the duration of the analgic and antibiotic therapy, the duration of the postoperative ileus, the immediate postoperative incidents and complications and the cost of the postoperative treatment.

MATERIAL AND METHODS

Out of 4270 patients who underwent a cholecystectomy in the Surgical Clinic 3 of Cluj-Napoca between 2001-2003, 3756 patients were operated laparoscopically. The study included 81 patients diagnosed with AC, randomly selected from the group of 4270 patients. They were distributed in two groups: group A – 40 patients who underwent laparoscopic cholecystectomy (LC) (1,06%) and group B – 41 patients who underwent the open procedure (OC) (7,78%). In A group, male patients represented 35% (14 patients) and female 65% (26 patients) in total; in the B group, 23 were men (57%) and 18 women (43%).

The average age in the laparoscopic group was 54.6 years (36-77). 16 patients had more than 60 years, representing 40% of group A; the female:male ratio was 1.3:1. In B group, the average age was 59.4 years (38-83); 29 patients (59,18%) had more than 60 years and the female:male rate was 1.4:1.

The comparative evaluation criteria of the patients included in this study were:

- duration of analgic therapy
- duration of antibiotic therapy
- duration of postoperative ileus
- duration of postoperative hospitalization
- intraoperative incidents

- immediate postoperative complications
- cost of postoperative medication and hospitalization

The data obtained was processed according to the Student and ANOVA test algorithms.

RESULTS

The intraoperative diagnosis of the patients is reproduced in table 1.

Table 1. Histological types of acute cholecystitis in the two groups

cholecystitis	catharral	flegmonous	gangrenous	total
LC	10	16	14	40
OC	7	15	19	41
total	17	31	33	81

The majority of the laparoscopic interventions were performed in a retrograde manner (RLC) – 36 cases (90%), followed by the bipolar (BLC) – 3 cases (7,5%) and anterograde cholecystectomy (ALC) – 1 case (2,5%). Among the open procedures, the retrograde cholecystectomy (ROC) was performed in 14 cases (34,14%), the bipolar one (BOC) in 14 (34,14%) and the anterograde one (AOC) in 13 cases (31,72%).

The repartition of the two groups regarding the approach and used technique is presented in Figure 1.

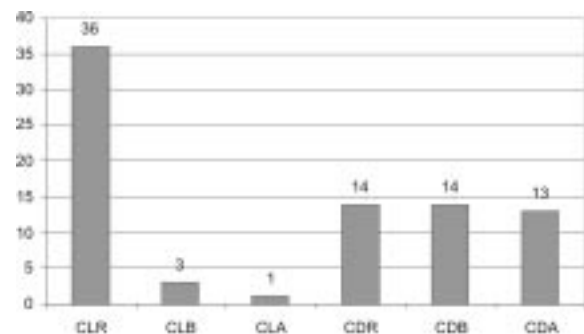


Figure 1. Repartition of the cases regarding the approach and surgical technique used

The average analgic therapy duration was significantly longer in the patients who underwent OC compared to the other group (5.6 days vs 2.88), $p < 0.05$ (Student test). The duration of analgic therapy presented small differences between the two sexes of the same group, especially in patients who underwent the laparoscopic procedure: 2.42 days (M) vs. 3.34 (F) for group A; an average of 5.43 days (M) vs. 5.77 (F) for group B (Fig. 2).

Of the patients included in the laparoscopic group, 36 received (90%) antibiotic therapy for 1-5 days. In group B, all patients received antibiotherapy for 1-14 days (Fig. 3).

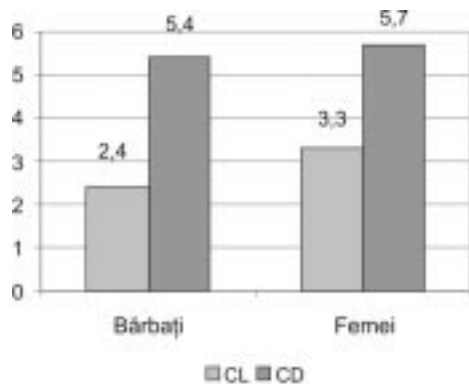


Figure 2. Duration of antalgic therapy

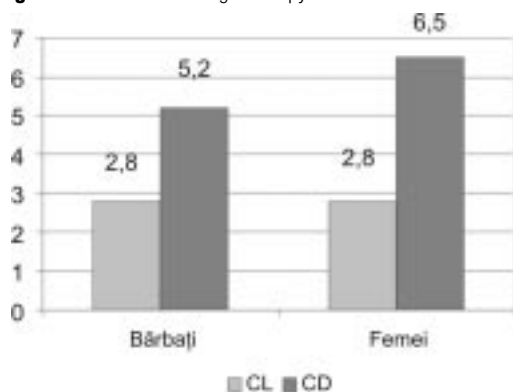


Figure 3. Duration of antibiotic therapy

The postoperative ileus, which lasted 1.85 days in average in group A, corresponds to the minimal invasive character of the technique. The duration of ileus was 2.91 days in group B ($p < 0.05$, Student test). The male:female rate for group A was 1.9 vs 1.8 days in group B it was 3.0 vs 2.7 days; the difference is not statistically significant – $p > 0.05$, Student test (Fig 4).

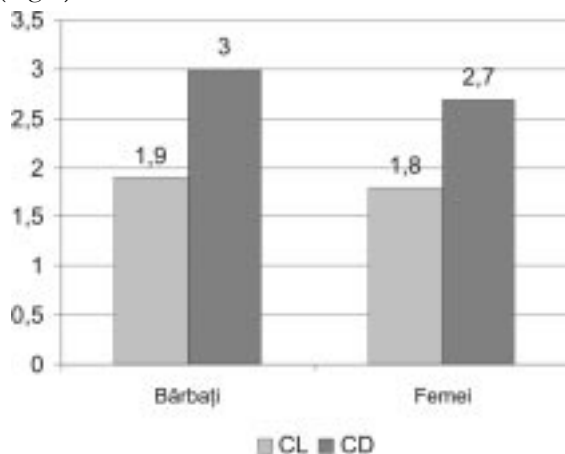


Figure 4. Duration of postoperative ileus

The duration of the hospitalization was longer for group A in only one case (13 days). In all other cases from group A, it was 2-7 days. The average postoperative hospitalization duration was significantly longer for the patients in group B compared to the others, with a value of 9.5 versus 4.5 days ($p < 0.05$, Student test). In group B, the

hospitalization period was longer than 20 days in 3 cases (Fig. 5).

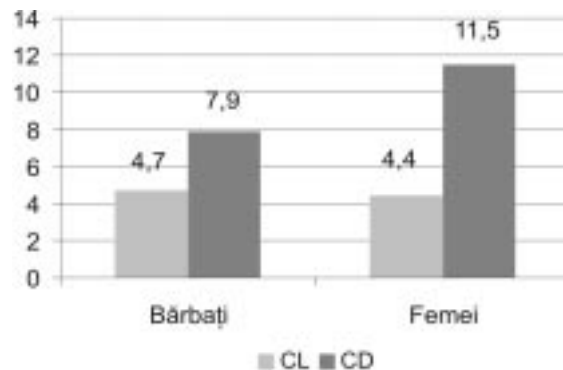


Figure 5. Duration of postoperative hospitalization

In group A were only two major incidents (5%): complete division and tangential injury of the cystic artery (CA). The CA was clipped in both cases and the haemostasis was completed by using Surgicele®. In other two cases (5%) the laparoscopic haemostasis with Surgicele® was also performed because of haemorrhage of the cystic bed. The perforation of the gall bladder during decollation and apprehension occurred in 11 cases (27.5%). There were 5 cases (12.2%) of haemorrhage of the cystic bed in group B, which were solved by Surgicele® haemostasis and one case (2.4%) with gall bladder perforation.

The postoperative complications, directly related to the surgical technique and difficulty degree, are presented according to the *Clavien* classification. The grade I complications (wound suppuration of the umbilical trocar point) was recorded in only one case (2.5%) in group A, which was solved by local treatment for a few days.

One case from group B (2.4%) required surgical reintervention in the 14th postoperative day for localized choleperitoneum, residual lithiasis of the common bile duct (CBD) and obstruction of the *Kebr* tube. This complication prolonged the hospitalization period and the duration of antalgic and antibiotic therapy.

The exploration of the CBD for the open procedures was necessary in 3 cases (7.31%) with lithiasis of the gall bladder and CBD. In one case, after the exploration of the CBD and extraction of the calculi, a choledochoraphy was performed on the *Kebr* tube. In two cases, additional to conventional cholecystectomy, a latero-lateral choledoco-duodenoanastomosis in *Stuart-Hoerr's* manner was performed. There were no severe or mortal complications recorded in either group.

The financial evaluation of the open and laparoscopic procedures included the cost of the postoperative medical treatment and the cost of the postoperative hospitalization. The average cost for the

medical treatment in the patients with laparoscopic cholecystectomy was 426,000 Lei (230,000-836,000 Lei).

The average cost of the medical therapy in group B was 966,400 Lei (310,000 -1,873,000 Lei).

The hospital fees (1,032,000 Lei/day) and the cost of medical treatment in the postoperative period were included in the postoperative hospitalization cost. For group A, it was 6,578,840 Lei (190.1\$; 1\$=34,600 Lei) vs. B group – 9,983,280 Lei (288.5\$) ($p < 0.001$, Student test).

The costs of the anaesthesia, surgical procedure and postoperative manoeuvres were not included.

DISCUSSIONS

The risks and complications of LC must not be over- or underestimated. Laparoscopy is not easy for the surgeon; his/her knowledge and experience are fundamental for the improvement of the results. Contrary to the initial reports, which stated the increase of the incidence of the complications, recent data prove a decrease of the morbidity and mortality for LC vs. OC.³⁻⁷

The success condition of LC in AC is the correct choice of the operative moment; it should not be delayed more than 4-5 days, otherwise perivesicular adhesions may develop, making the intraoperative lysis much more difficult.⁸⁻¹⁰ Over this limit, the perivisceritis consolidates, confusing the anatomy and increasing the conversion rate.^{8,11} From this point of view, the postponed emergency strategy must be abandoned.

The conversion must not be considered a failure, but a reasonable decision for the prevention of complications and injury of the CBD.^{12,13}

Many necroptic studies showed the direct increase of the incidence of AC with age; the incidence is maximal for the 7th and 8th decades.¹⁴ The age itself did not represent a contra-indication for the surgical procedure, but its association with a higher morbidity and mortality in younger patients^{15,16} makes the non-surgical treatment to be chosen prior to surgery. Furthermore, cardiac, pulmonary and metabolic conditions, as well as the slow evolution of lithiasis make the surgical intervention more difficult.

Regarding the postoperative pain, there are statistically significant differences for the maximal intensity pain, as well as for the pain in general (1.7-5.4 days average for LC and 7-12.2 days for OC).¹⁷ In laparoscopic cholecystectomy, the algic symptoms are usually minor and localized at the trocar points and in the shoulder; they are explained by the irritating action of the carbon dioxide on the diaphragm. The administration of common antalgics proves to be

insufficient for the relatively short duration of the pain. For OC, the prolonged algic syndrome is determined by surgery itself, which is more traumatizing for the patient; this is the reason for the longer antalgic drug administration. The results of the study correlate with the data from the literature, although for the OC patients the average antalgic therapy duration was 5.6 days, shorter than in other studies.

The postoperative therapy in the patients of the LC group was indicated in only 90%. All OC patients required postoperative antibiotherapy. The duration of antibiotherapy for group B was longer than for group A. We can explain the long duration of antibiotherapy in group B by the fact that with this approach were treated the cases with infectious complications and lithiasis of the CBD.

The intestinal transit usually reappeared in 12-24 hours after surgery in patients of group A. The liquid intake was allowed 6 hours after awakening.¹⁸ For OC, a more intense sympathetic reaction occurs compared to the laparoscopic approach, because of the stimulation of a larger number of algic receptors of the parietal peritoneum; the induction of a longer dynamic ileus occurs.

There are no significant differences between the postoperative complications of LC or OC. It is important to notice that there is a clear decreasing trend of the complications of LC, especially minor biliar problems, together with the increase of the learning curve of the technique and the accumulation of surgical experience.

A major advantage of the laparoscopic technique is represented by the significant reduction of the postoperative hospitalization and treatment cost compared to OC. The economical aspect promoted the LC in all countries,¹⁹⁻²⁷ because of the reduction of hospitalization costs and a shorter convalescence than after OC.

CONCLUSIONS

1. The duration of the postoperative algic syndrome and antalgic therapy is shortened in the patients who underwent LC than OC.
2. The postoperative ileus in the LC patients is shorter because of the minimal invasive character of the intervention.
3. There are no significant differences regarding the postoperative complications of LC and OC.
4. The reduction of the conversion risk requires the performance of LC in the first 96 hours because the local morphologic modifications have no time to develop.
5. Other advantages of LC are the shortened

postoperative hospitalization, the lower costs of medication and the quicker social and professional reintegration.

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