

Laparoscopic cholecystectomy: summary of five years results

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³ GOB 8- September, Skopje, R. Macedonia

ABSTRACT

In the Republic of Macedonia, laparoscopic cholecystectomy has been introduced early. In GOB 8 September, laparoscopic cholecystectomy has been in 1993. During the last decade, from September 2009 to October 2014, 1352 operations were performed. In 49 cases (3,62 %) surgeons decided on conversion procedure. 40 (82 %) of these conversions were so called elective and on the other hand, 9 (18 %) of them were caused by complications. Complications were found in 75 (5,54 %) cases. They have been classified in four groups, and have been analyzed by the period in which they occurred: period A, 274 patients until 2010, period B, 551 patients until 2012, and period C, 527 patients until 2014. There was a significant decrease of complications rate ($p < 0,001$) in the period B, comparing to the period A. Period B and Period C did not differ statistically ($p > 0,05$) in all four groups (kinds) of complications. Laparoscopic cholecystectomy provides many advantages in comparison to other procedures treating cholecystolithiasis, however, it is characterized by some limited possibilities and complications, some of which closely related to the laparoscopic procedure.

Key words: laparoscopic cholecystectomy, complications

INTRODUCTION

Laparoscopic Cholecystectomy (LC) was established in the surgical practice in 1987. Numerous advantages contribute to the fact that this procedure is attractive for both, the surgeons and the patients. In the last fifteen years, in the advanced countries, the LC imposed itself as a method of choice for treatment of gallbladder lithiasis (1,2). LC has been implemented at our Clinic in 1998. In the initial period, a lot of time and were allotted effort to convince the sceptics (including the medical public) for the positive goals achieved with the minimum invasive approach performing this operation. Five years later, after more than one thousand operations (1352), we are competent to say we have a clean observation of all the aspects of the operation. Now we are in completely different situation, to explain (including medical public) that LC is not an easy and banal operation, which is to be performed in high-risk patients. LC has its own advantages, but also limits and complications, some of them particularly specific for the procedure. The aim of this paper is to present and analyze exactly these aspects of the operation.

MATERIAL AND METHOD

We analyzed 1352 nonrandomized patients who underwent elective LC, from September 2009 through October 2014. Indication for surgery was symptomatic cholecystolithiasis. The diagnosis was confirmed with clinical examination, ultrasound, and laboratory examination. Additional examinations were performed if necessary. Contraindications for LC were incapability of the patient to sustain general anesthesia, severe disturbances in the coagulation, previous abdominal operations with supraumbilical approach and pregnancy. Preoperatively, the patients visited anesthesia outpatient unit for evaluation of the operative risk. In addition to the routine laboratory analysis, lung x-ray examination and ECG were done. If necessary, aconiliar opinion and advice of an appropriate specialist (pulmologist, cardiologist, endocrinologist) were provided. Intravenous cholangiography (i.v.c.) was preoperatively performed in 894 (66 %) patients. The operation was performed in general anesthesia with a standard technique through four ports, with use of electrocoagulation, described in detail by the same authors in other publications (3). The so called elective conversions were not considered as complications of the LC. On the other hand, conversions performed and caused by the complications are considered as complications of the LC.

The complications are divided in four groups:

I group: mild systemic complications causing certain undesirable additional patient's discomfort that demanding appropriate alteration in the routine therapy, but usually do not delay the planned discharge of the patient from the hospital and do not threaten the life of the patient: vomiting, distension with delayed peristalsis for more than 48 hours, intolerance for peroral liquid intake for more than 48 hours, diuretic disturbances.

II group: severe systemic complications demanding significant therapy, that prolong the hospitalization period, severely threatening the health condition, sometimes even threatening life of the patient: cerebrovascular insults (thrombosis or hemorrhage), cardiac insults (infarcts, acute decompensated failures), pulmonaly insults (pneumonia, atelectasis, respiratory insufficiency requiring assisted or controlled respiration), renal failures (acute renal insufficiency leading to haemodialysis), thrombembolism.

III group: local complications related to the operative technique: lesion of the billiary ducts (ligation, transection, tangential lesion), billiary collection and/or leakage (detention-relaxation of the ligation, insufficiency of the suture or clips on the cystic duct, billiary secretion of the gallbladder bed in the liver, unspotted and transected aberrant billiary duct-Lushka, billiary evacuation through approximate drainage for more than 3 days), bleeding with an abundance requiring blood transfusion or re-operation, lesion of a cavity organ, residual calculosis in the billiary ducts.

IV group: complications related to the surgical wounds. For better observation of the evaluation of the operation, the patients were divided in three groups, that is periods: A, B, C.

Group-period A comprised 274 patients operated laparoscopically until 2011. This was the period when assessment of the basic values of the operation, and its learning curves of the operation, was done (4). In group-period B, 551 patients from 2012 until 2013 were analyzed (5). Group-period C included 527 patients operated from 2000 until October 2014.

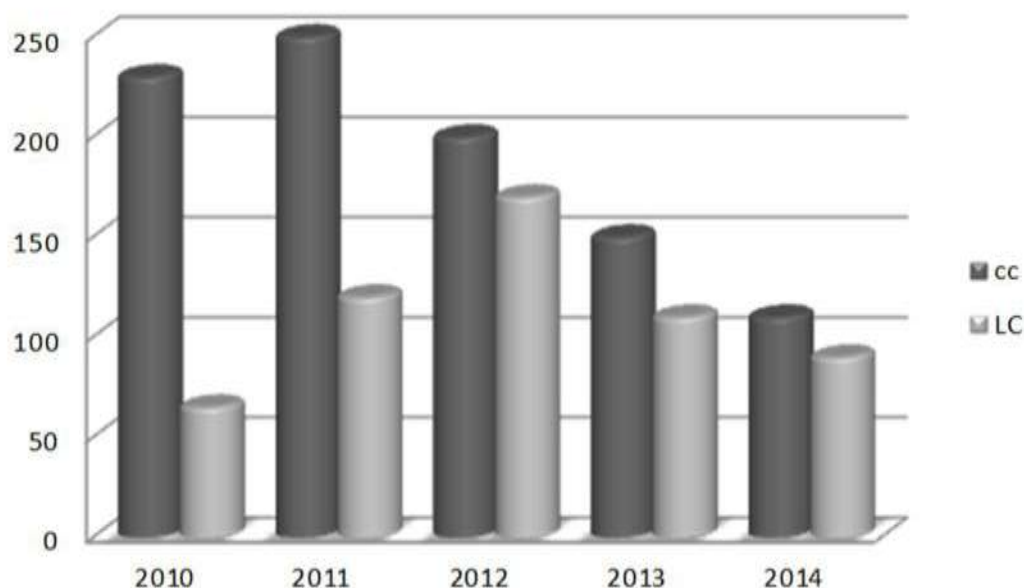
Statistical analysis was done by using standard statistical methods with a commercial computer program statistica-stat-soft. Values $p < 0,05$ were considered significant (S), $p < 0,001$ very significant (VS), and $p > 0,05$ insignificant.

RESULTS

From September 2009, through October 2014, LC was performed in 1352 patients, 1068 (79 %) female, and 284 (21 %) male. Frequency ratio of LC versus CC at our Clinic is presented in Table 1.

Average age of the patients was 44,76 (15-81) years.

TABLE 1 Classic versus laparoscopic cholecystectomy



Reasons for conversion are presented in Table 2.

TABLE 2 Reasons for conversion

	Elective 40 (82%)	Caused by complication 9 (18%)	
Adhesions	15	Lesion of the common bile duct	3
Unrecognized anatomy	11	Lesion of the stomach	1
Bilioenteric fistula	3	Lesion of the small bowel	1
Pericholecystic abscesses	5	Bleeding	2
Big ovarian cyst	1	Dropping of the gall stones	2
Carcinosis of the peritoneum	1		
Problems with the technique/devices	4		

Conversions were done in 49 (3,62 %) patients, out of which in 9 (18%) patients due to complications

In table 3 complications by groups and periods, are presented

TABLE 3 Complications by groups and periods

	Group	A	B	C	Total
I	n.(%)	24 (8.75) *	11(1.99)'	4 (0.75)	39 (2.88)
II	n.(%)	0(0)	0(0)	1 (0.19)	1 (0.07)
III	n.(%)	7 (2.55)	9 (1.63)	8 (1.52)	24 (1.78)
IV	n.(%)	4 (1.45)	2 (0.36)	5 (0.95)	11 (0.81)
V	Total	35 (12.77)'	22 (3.99) *	18 (3.41)	75 (5.54)

According to the definition, complications from the third group are correlated with the highest morbidity; therefore, the reasons for this kind of complications are separately presented in Table 4.

TABLE 4 Third group of complications - reasons for their onest

	Number	%
Lesion of a billiar duct	6	0.44
Billiar collection '	7	0.52
Lesion of a cavity organ	2	0.15
Bleeding "	4	0.30
Residual calculosis	5	0.37
Total	24	1.78

Three of six lesions of the hepatocholedochus were recognized intraoperatively and resolved after conversion. Two patients with a complete lesion of the hepatocholedochus (transsection) were

reoperated, the first one week after LC, and the second 2 weeks after LC. One patient with a tangential lesion of the hepatocholedochus was operated on two months later. Reoperation was necessary in one patient with a biliary collection (leakage), caused by low tension-relaxing of the clips placed on the cystic duct, due to bleeding. Bleeding itself was a common reason for conversion in two patients. Average postoperative hospitalization was 1,96 days. Operative mortality (up to 30 days from the operation) in patients with performed LC was 0.

DISCUSSION

Randomization of the patients for this study was impossible because the patients in our country pay defined participation fee, aimed at providing the indispensable instruments for single use, that allow continuity in the procedure. The idea to divide the patients into groups according to periods was a consequence conducted by the previous references, after defining the standards and the learning curves for LC in the first period. This was achieved by comparing the results of LC with those of the classic cholecystectomy (CC) (4). In the second period comprising the period until 2009, the frequent performing of the LC, resulted in cumulating of experience and, improvement was obvious. At the same time, the main weakness of LC was emphasized, presented in the operative lesions of the biliary ducts (5). The third period, until 2014, comprising approximately the same number of patients as the second period (527 v 551), and it revealed the developing evolution of the LC. In the beginning, as a relative contraindication for LC, we considered the extreme obesity. In the meantime, we were convinced in the advantages of the minimum invasive approach applied these patients, particularly their early postoperative mobilization. The experience of other authors coincides with our opinion (6). Many reports of successful LC in pregnancy have been published (7,8). On the other hand, there are conducted and well documented experiments on animals, undoubtedly pointing the presence of distress for the fetus during laparoscopy, with further unpredictable consequences (9). We have an attitude at our Clinic not to perform LC in pregnant women. The only pregnant patient that was operated on with LC, delivered a healthy child. Speaking about the cardiologic and pulmologic relative contraindications, until providing necessary instruments (lifters for the so called gasless technique for LC, which would enable us to avoid the use of pneumoperitoneum with CO₂ and/or technical devices for monitoring the haemodynamic disturbances, we are willing to conduct CC in the patients with high cardiologic and pulmologic risk. (10,11). There is smaller animosity concerning this issue, in a advanced

countries (12). There is a consensus of the authors that conversions are not complications of L.C. On the contrary, the surgeons have to maintain an appropriate attitude towards this problem, and they have not to be reserved for a moment during the procedure to proceed the operation with the classic method, if they estimate that it is of interest for the patient (13). The number of conversions in our material is close with the number published in the big multi centric surveys (2,15). Of course, it is better to divert to conversion than to cause a lesion of the biliary duct, or some other vital organ. This approach is accepted at our Clinic since introducing the procedure and thus we believe that high rate (82 %) of elective conversions has been reached. Consequently, only 18 % of the conversions were done after complications occurred. Actually, the injuries of the hepatocholedochus took place in ordinary cases with a routine performed procedure; the surgeons were experienced and skilled for LC, with more than a hundred performed LC. This facts advocate that LC demands great experience and training, but also maximum vigilance and concentration of the entire team during the entire procedure. Three of six lesions of hepatocholedochus were discovered intraoperatively, and after conversion were resolved in appropriate manners, with a primary suture over a T-drain. Injuries of the small bowel and the stomach did not occur as we would expect, while the initial puncture with the Veres needle was done, or during the instillation of the troakars, but lately when the operation was advancing. These lesions would have been reconstructed laparoscopically, if at the time the surgeons possessed adequate instruments, suture material and training for intracorporal suture technique. This is an argument that shows that LC requires complete team and consistent training (15). Bleeding was not an often cause leading to conversion. In one patient it was bleeding from a cavernoma of the hepatoduodenal ligament, in other patient, the bleeding occurred from the xifoid port, but it was observed that the gallbladder was scleroatrophic with massive adhesions. This was predominant factor for the decision for conversion, otherwise we would tried to accomplish laparoscopic haemostasis. In the literature there are many reports dealing complications as a result of spilled gallstones (16,17,18,19,). That is the reason why we firmly insist all spilled gallstones to be collected in Endo-Bag, as well as, the extraction of the gallbladder necessarily to be done also in Endo-Bag, while there is even a minor suspected possibility of tearing and dropping the gallstones. In two patients conversion was necessary, imposed by spilled gallstones. So far, specific complications determined by spilled gallstones have not been noticed in our material. The comparison of the number of complications in the first and second period (A versus B) confirmed statistically significant difference ($p < 0,001$). Thus, there was a remarkable decreased number of complications but only when small systemic

complications were concerned. Reduction of other complications did not show statistical significance ($p > 0,05$). In all four groups of complications, their number in the second B period, compared with their number in the third C period, did not reach statistical significance ($p > 0,05$). The real absence of big systemic complications (II group) is amazing. The only explanation can be minimum invasive approach and early postoperative mobilization of the patients. The results have revealed that thus method has reached its limit and no remarkable improvement are to be expected unless new technology in the operative technique is implemented. In 6 (0,44) patients lesion of a biliary duct was done.

CONCLUSION

The results obtained from the analysis of LC, in all parameters are comparable with the results published in the other countries. The question concerning the undesirable frequency of the of biliary ducts lesions, remains constant and open. Permanent advocating to this challenging danger, as well as solid attitude to the conversions, we present a potential to facilitate this problem. The obvious paradox of better achieved results, and not frequent application of the laparoscopic operation should be resolved by financial and management improvement.

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