

## Revista e Shkencave Mjekësore e Kosovës Journal of Medical Sciences of Kosova



### Priorities of laparoscopic cholecystectomy versus open Cholecystectomy : experience from two Centre's

Afrim Q. Avdaj<sup>1</sup>, Mehmet Maxhuni<sup>2</sup>, Nikollaq Kacani<sup>3</sup>, Agron Bytyqi<sup>1</sup>, Fjolla Hyseni<sup>2</sup>  
\*Nexhmi Hysen<sup>2</sup>

<sup>1</sup>, Surgery Department, Regional Hospital of Prizren, Republic of Kosovo

<sup>2</sup> University Clinical Centre in Pristina, Republic of Kosovo

<sup>3</sup> University Hospital Centre in Tirana, Republic of Albania

#### ARTICLE INFO

##### Article history:

Received 10 December 2013

Accepted 03 February 2014

##### Keywords:

Laparoscopic  
cholecystectomy  
priority and  
complication

##### 1 Corresponding author at:

Afrim Q. Avdaj,  
Surgery Department,  
Regional Hospital of  
Prizren, Republic of  
Kosovo

#### ABSTRACT

Disease of the gallbladder and bile duct are common in adult population. Accurate clinical assessment, including pertinent history and accurate physical examination, yields valuable information about the diagnosis of common diseases of the biliary tract.

Laparoscopic cholecystectomy (LC) has been instrumental in ushering in the laparoscopic era. Laparoscopic cholecystectomy has rapidly become the procedure of choice for routine gallbladder removal and has become the most common major abdominal procedure performed in Western countries. Upon entry in using of laparoscopic cholecystectomy in surgery as minimal invasive method lay the basis of the most important innovation in history of surgery. LC decreases postoperative pain, decreases need for postoperative analgesia, shortens hospital stay from 1 week to less than 24 hours, and returns the patient to full activity within 1 week compared to 1 month after open cholecystectomy (OC). LC also provides improved cosmesis and improved patient satisfaction as compared to OC.

Laparoscopic cholecystectomy has a complication rate of under two percent. It is a well-documented and frequently-performed procedure. With this problem and based in results of intra-operative complications and early also lately post-operative complications, have proven that laparoscopic cholecystectomy has advantage over the conventional method of gallstones treatment.



## INTRODUCTION

Disease of the gallbladder and bile duct are common in adult population. Accurate clinical assessment, including pertinent history and accurate physical examination, yields valuable information about the diagnosis of common diseases of the biliary tract [1].

Laparoscopic cholecystectomy (LC) has been instrumental in ushering in the laparoscopic era. Laparoscopic cholecystectomy has rapidly become the procedure of choice for routine gallbladder removal and has become the most common major abdominal procedure performed in Western countries.[2]. Upon entry in using of laparoscopic cholecystectomy in surgery as minimal invasive method lay the basis of the most important innovation in history of surgery. LC decreases postoperative pain, decreases need for postoperative analgesia, shortens hospital stay from 1 week to less than 24 hours, and returns the patient to full activity within 1 week compared to 1 month after open cholecystectomy (OC). LC also provides improved cosmesis and improved patient satisfaction as compared to OC.[3, 4]

Laparoscopic cholecystectomy has a complication rate of under two percent. It is a well-documented and frequently-performed procedure. With this problem and based in results of intra-operative complications and early also lately post-operative complications, have proven that laparoscopic cholecystectomy has advantage over the conventional method of gallstones treatment [5, 6, 7, 8]

## OBJECTIVE

Analyzing of the cases with cholelithiasis at which has become cholecystectomy with laparoscopy and classical method regarding to sex and age and residence, to analyze the report between complications intra and post operation precocity to two methods, to be analyze the advantages and disadvantages of both operative procedures for management and treatment of cholelithiasis.

## MATERIAL AND METHODS

There were analyzed 200 patients which were examined, diagnosed, operated and followed after the operation one year. The method of research was prospective – retrospective.

The patients were divided into two groups: The first group consists of 100 patients operated with laparoscopy in Centre of laparoscopies "Prince Sultan" Clinic of Surgery in University Centre of Kosovo in Pristina,. Second group consist of 100 patients operated with the classical method in the Department of Surgery at the Hospital "Prim. Dr. Daut Mustafa" in Prizren in the last two years period. Diagnosis of all patients was confirmed before surgical intervention with ultrasound, than at all patients was done the preoperative preparation, was taken the anamnesis, and also was done the hematology

and biochemistry examination. At some suspected cases was done also cholangiography and abdominal CT. A retrospective study was performed of all patients who underwent an elective cholecystectomy by three consultants in a district general hospital between January 1999 and January 2000. The demographic details, indications for surgery, details of the emergency admissions while on the waiting list, and the treatment given during these episodes were recorded. One hundred and fifty six patients were included in the study, of which 122 (78%) were females. The mean (SD) age of the patients was 54 (5) years. The mean waiting time for surgery in these patients was 12 (3) months. Thirty seven patients (23.7%) were admitted as an emergency due to gallstone related symptoms and complications while awaiting surgery. There were 47 episodes of admissions in total, of which 32 were for biliary colic, 13 were for acute cholecystitis, and two were for acute pancreatitis. In addition to routine blood tests, 20 abdominal radiographs, 10 chest radiographs, three endoscopic retrograde cholangiopancreatography tests, five ultrasonograms, and one computed tomogram were carried out in these patients. The mean duration of each episode of admission was three days.

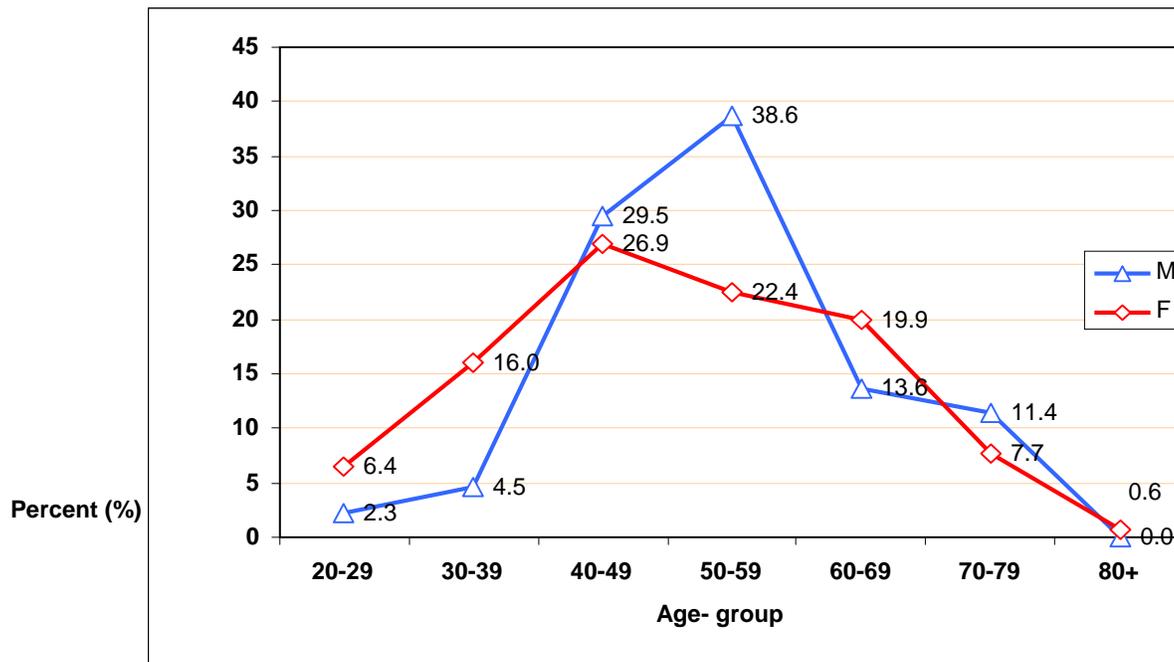
## RESULTS

With the distribution of cases by age-groups we have gained greater structure of presentation at the age-group 40 - 49 yrs., 27.5 %, then the age-group 50-59 yrs., 26.0%. After age 70 years number of cholecystectomy decreases from 8.5 % at age 70-79 years to 0.5 % over the age of 80 years. With the distribution of patients by age and gender we have won differences in structure according to gender. Significant differences in the structure we have gained in the age group 30-39 years, cholecystectomy were more frequent in females compared with males (16.0 % vs. 4.5 %) and 50-59 year age-group with frequent in males than in females (38.6 % vs. 22.4 %). Gender poses significant factor in many diseases. In our material we have gained significant difference in the number of patients to whom it is made cholecystectomy by gender (X<sup>2</sup>-test = 62.72, p <0.0001). So the 200 patients involved in research 156 or 78.0% were female and 44 or 22.0% were male (Tab 1/Figure 1).

### 1 Patients researched by age-group and gender

Age-group	Gender				Total	
	M		F			
	N	%	N	%	N	%
20-29	1	2.3	10	6.4	11	5.5
30-39	2	4.5	25	16.0	27	13.5
40-49	13	29.5	42	26.9	55	27.5
50-59	17	38.6	35	22.4	52	26.0
60-69	6	13.6	31	19.9	37	18.5
70-79	5	11.4	12	7.7	17	8.5
80+	-	-	1	0.6	1	0.5
<b>Total</b>	<b>44</b>	<b>100.0</b>	<b>156</b>	<b>100.0</b>	<b>200</b>	<b>100.0</b>
Mean	54.1 y.		51.2 y.		51.9 y.	
SD	11.2 y.		13.1 y.		12.8 y.	

Figure 1. Structure of participants by age-group and gender

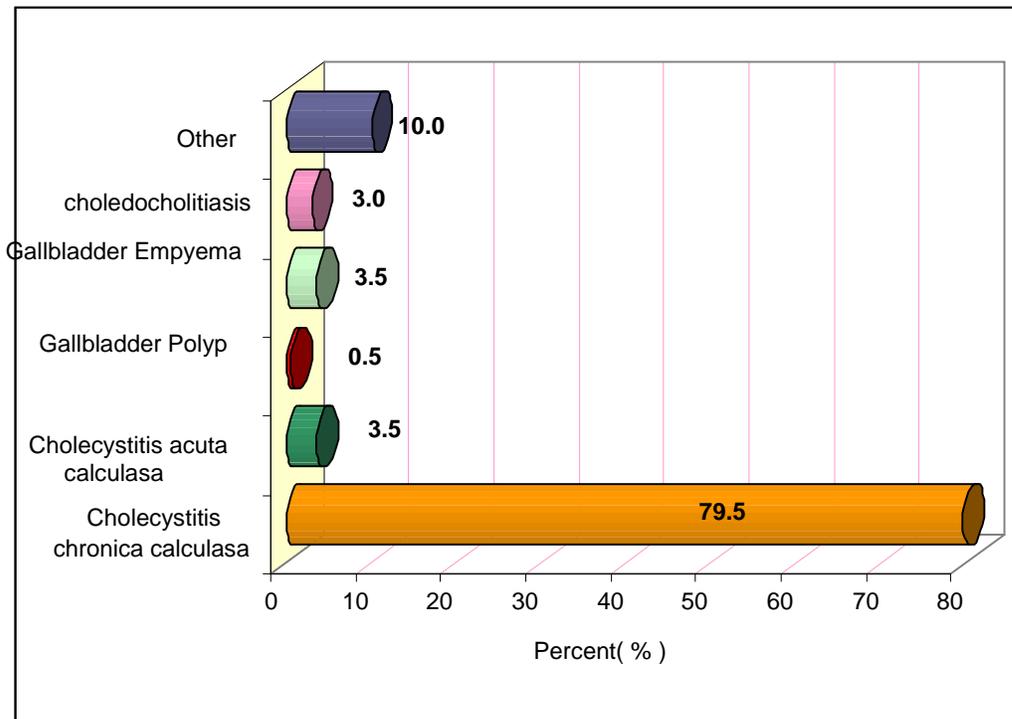


**Figure 1.** The average age of patients at which was made cholecystectomy was 51.9 years (standard deviation  $\pm$  12.8 years). The average age of male patients was 54.1 years (SD  $\pm$  11.2 years), while the average age of female patients was 51.2 years (SD  $\pm$  13.1 years). With T-test we have not earned the distinction with important statistical significance average age by gender (t-test = 1.33,  $p > 0.05$ ),

In our clinical material, the most common diagnoses for which is due to become cholecystectomy with laparoscopic method or classic laparotomy were chronic gallstone cholecystitis in 79.5% of cases, gallbladder empyema in 3.5% and chronic cholecystitis with choledocholithiasis in 3% of cases (Table 2 and **Figure 2**).

**Tab. 2 patients investigated by clinical diagnoses**

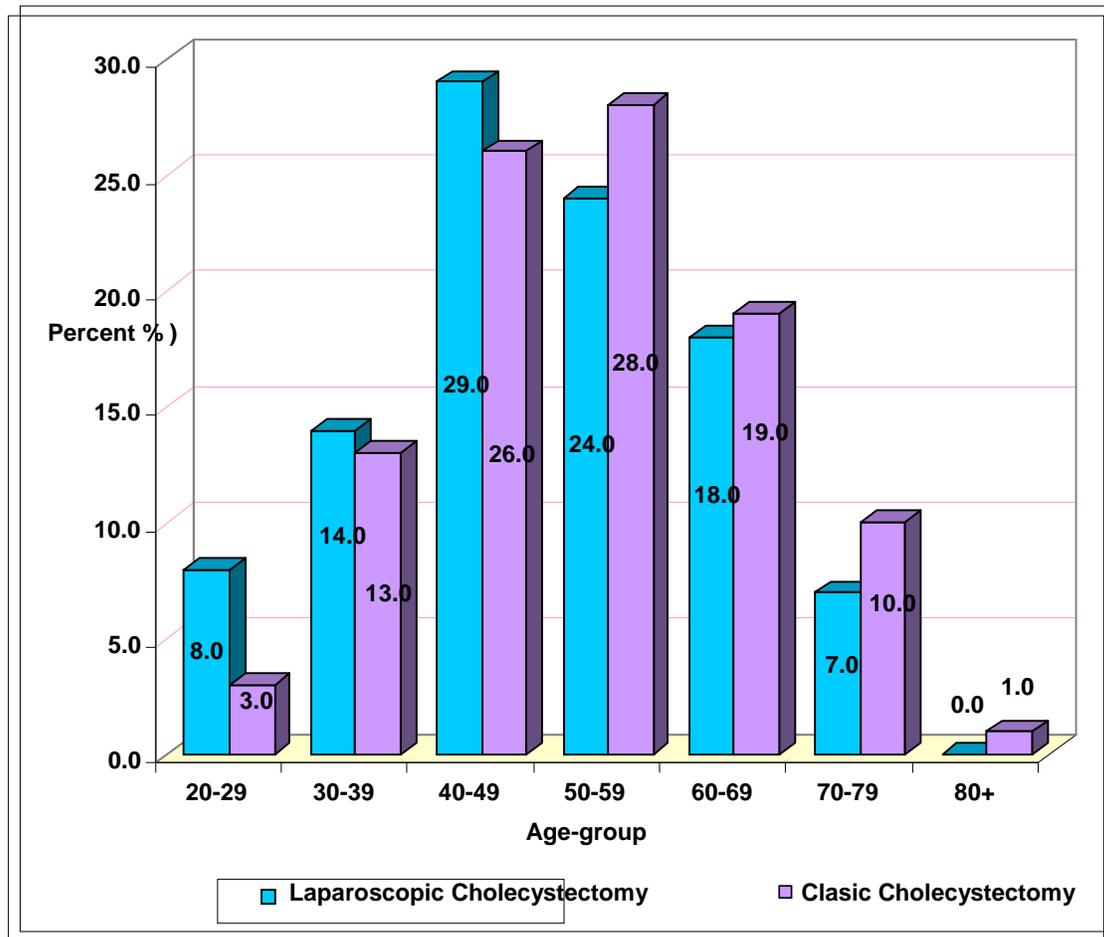
Clinical dg.	N	%
Cholecystitis chronica calculasa	159	79.5
Cholecystitis acuta calculasa	7	3.5
Gallbladder Polyp	1	0.5
Gallbladder empyema	7	3.5
Choledocholithiasis	6	3.0
Other	20	10.0
<b>Total</b>	<b>200</b>	<b>100.0</b>



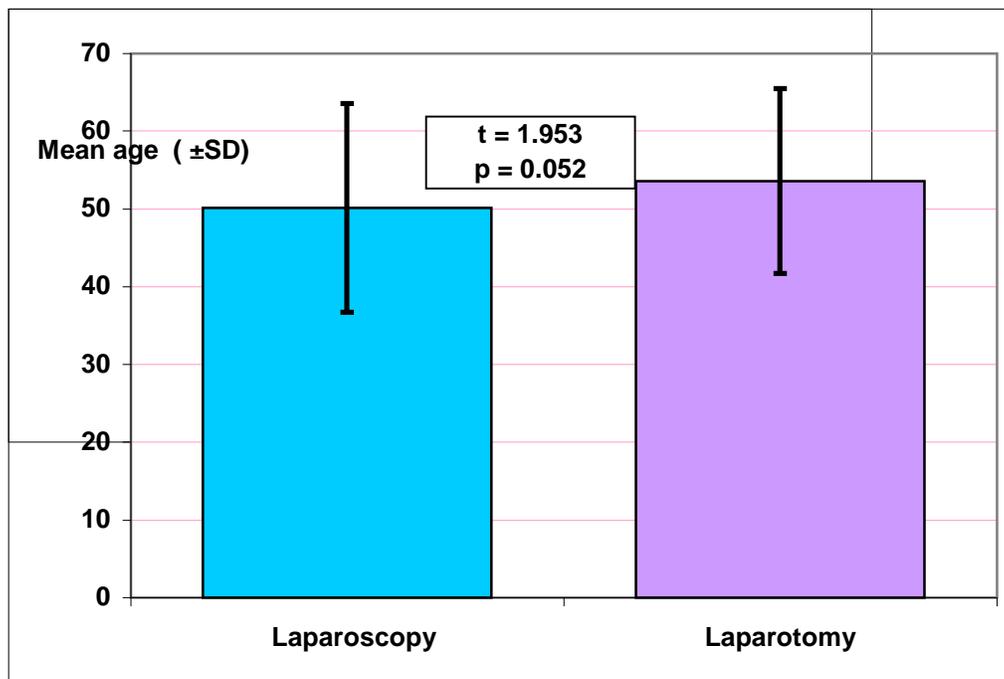
**Figure 2. Structure of clinical diagnoses**

The age group most commonly operated with this method was 50-59 years with 28.0%, then 40-49 yrs. 26.0% and 60-69 yr. 19.0%. We had only one patient with 80 or more years. The average age of patients in whom surgery was done with classical laparotomy was 53.6 years (SD  $\pm$  11.9 years).

Significant differences in the structure have gained in age groups 20-29 years and 40-49 years where many was operated with laparoscopy than with classical Cholecystectomy (8.0% vs. 3.0% and 29.0% vs. 26.0%) and the opposite many with classical Cholecystectomy than laparoscopic Cholecystectomy in 50 patients-59 year age group (28.0% vs. 24.0%). In the middle-aged to be researched by groups opposed to not have gained significant statistics (t-test=1,953, p=0.052) **Figure 3** and **Figure 4**.



**Figure 3** The distribution of patients in whom surgical intervention (cholecystectomy) was made with classical Cholecystectomy and Laparoscopic Cholecystectomy by age group.

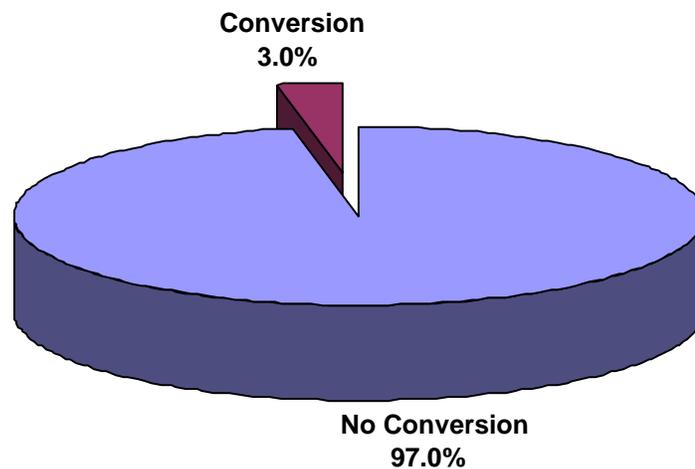


**Figure 4. The average age of the researched by groups**

From 100 patients in whom was done laparoscopic cholecystectomy at 3 or 3.0% patient had become to conversion in laparotomy due to Mirizzi syndrome (one patient), fistula between gallbladder and stomach (one patient) and choledocholithiasis (1 patient) (Table 3, figure 6).

**Tab. 3/ Figure 5. The number and causes of conversions in the group of patients operated with laparoscope**

Completion of laparoscopic cholecystoectomy		N	%
Laparoscopic cholecystectomy		97	97.0
Laparotomy		3	3.0
<b>Total</b>		<b>100</b>	<b>100.0</b>
<b>Causes of conversions</b>	Sy Mirizzi	1	
	cholecysto-gastric Fistula	1	
	Choledocholithiasis	1	

**Figure 5.**

In our clinical material at laparoscopic cholecystectomy we have not had any intra-operative complications or early post-operative. The group of patients with classical cholecystectomy we have had bleeding during surgery to 4.0 % of cases, reoperation 2.0 %, 5.0 % wound infection, incisional hernia 4.0 %, anomalies of cystic arteries. 2.0 % and 1.0 % dehiscence of operative wound. At two groups we have not any case of death and anomalies of d. cystic (Table 4).

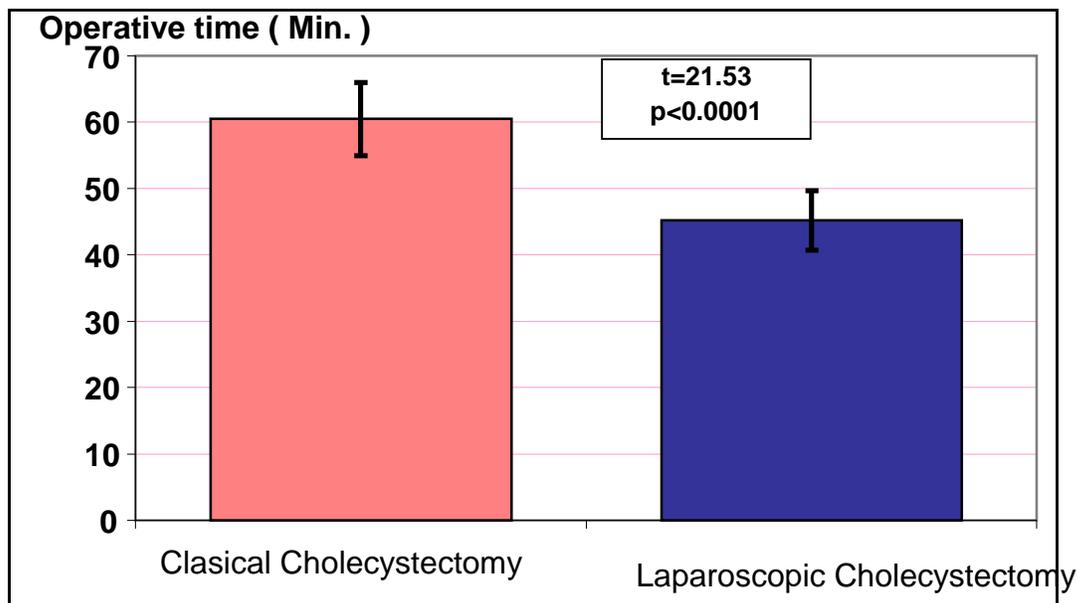
**Tab. 4. The number and structure of the complications of cholecystectomy by groups**

<b>Complications</b>	<b>Gr. with classic cholecystec. n = 100</b>	<b>Gr. with laparoscopic cholecystec. n = 100</b>
Hemorrhage during surgery	4 ( 4.0 %)	-
Re-operation	2 (2.0 %)	-
Wound infection	5 ( 5.0%)	-
incisional Hernia (laparocoela)	4 (4.0%)	-
Anomaly of cystic arteries.	2 (2.0%)	-
Wound Dehiscence	1 (1.0%)	-
Exitus letalis	-	-

That laparoscopic cholecystectomy is more appropriate than classical methods show the data. The average duration of surgery at classical cholecystectomy was 60.5 minutes (SD  $\pm$  5.5 min), whereas at laparoscope 45.2 minutes (SD  $\pm$  4.5min). T-test averages (student test) we have gained significant difference statistics according duration of the operation by groups (t-test = 21:53,  $p < 0.0001$ ) Figure 6. Difference with statistical significant we have also gained in average hospital stay by groups (t-test = 35.65,  $p < 0.0001$ ). Median duration of hospitalization was 6.8 days to classical cholecystectomy (SD $\pm$ 1.4 days), whereas at laparoscope 1.5 days (SD $\pm$ 0.5 days). The average time to return to life and work after classical cholecystectomy was 60 days (SD $\pm$ 5 days), whereas after laparoscope 30 days (SD $\pm$ 5 days). With t-test of averages (student test) we have gained significant statistics difference at the time of return to work and life according on groups (t-test=42.42,  $p < 0.0001$ ). Also, the total cost for the operation of classical cholecystectomy is greater than the laparoscope (€ 800 vs. € 600) (Tab.5).

**Table 5. The distinguishing characteristics of the two operative techniques**

Characteristics	Group. with classical cholecystectomy. n=100 ( Mean $\pm$ SD )	Group. with laparoscopic cholecystectomy. n=100 ( Mean $\pm$ SD )	t-test p-value
Duration of surgery	60.5 $\pm$ 5.5 min	45.2 $\pm$ 4.5 min	t=21.53 p<0.0001
Average hospital stay	6.8 $\pm$ 1.4 days	1.5 $\pm$ 0.5 days	t=35.65 p<0.0001
Time to return to work and normal life	60 $\pm$ 5 days	30 $\pm$ 5 days	t=42.42 p<0.0001
The total cost for operation	800 €	600 €	

**Figure 6. Structure of patients according to the average duration of surgery and groups**

The ability of the peritoneal cavity exploration and identification of elements is major at laparoscopy and middle at classical laparotomy (vs. 5.3). The damage possibility of the skin, muscles, arteries and surface nerves is great to classical laparotomy and there doesn't exist to laparoscopy (5 vs. 0). The possibility of iatrogenic injury is great at classic laparotomy and little while to laparoscopy (5 vs. 1), (Table 6).

**Tab. 6. The distinguishing characteristics expressed in the range of two operative techniques**

	Laparotomy cholecystectomy	Laparoscopic cholecystectomy
	Rate	Rate
Damage to the skin, muscles, arteries, surface n.	5	0
Exploring the peritoneal cavity	3	5
Identifying the elements	3	5
The possibility of iatrogenic injury	5	1

**Rate**

0 - nothing

1 - small

3 - middle

5 - large

**Discussion**

Laparoscopic cholecystectomy is one of the most commonly awaited general surgical procedures in the world [1,2,3,4]. The optimum approach to treatment includes early cholecystectomy within 3 days of the onset symptoms [5]. This approach prevents the complications such as perforation or gangrene of gallbladder and makes the surgical procedure easier than if it were performed later in the course of disease, when the inflammatory reaction and edema are more severe [national institute 6] In our clinical material significant differences in the structure have gained where many was operated with laparoscopy than with classical Cholecystectomy. However, many patients awaiting a cholecystectomy are admitted with recurrent gallstone related symptoms while on the waiting list, resulting in significant morbidity 7,8, 9,. Ozkardeş et al. noticed that despite intraoperative and postoperative complications being associated more with early laparoscopic cholecystectomy compared with delayed intervention, early laparoscopic cholecystectomy should be preferred for treatment of acute cholecystitis because of its advantages of shorter hospital stay and lower cost [10]. Performing early laparoscopic cholecystectomy for acute cholecystitis may help to reduce costs by preventing recurrent emergency admissions in these patients. Further studies to identify risk factors associated with recurrent symptoms and complications in patients with gallstone disease may help to priorities them for early surgery [11] . Laparoscopic procedure is not easy for the surgeon, in-depth instruction as well as

experience being fundamental for upgrading of results. S Duca Et al. Reveald that one of the most frequent situations carrying an increased operative risk is acute cholecystitis and pericholecystitis that changes the local anatomy and increases the difficulty of identifying the cystic pedicle and common bile duct (CBD), and because it is impossible to perform antegrade cholecystectomy in most such cases, there is a high risk of CBD injury. Also the cleavage plane in the gallbladder bed is lost, and that makes it easy to penetrate the liver parenchyma during dissection of the gallbladder, thus creating the possibility of postoperative bile leak, haemorrhage and subhepatic abscess [7]. To minimize the risk of iatrogenic injuries, the surgeon must possess the skills to recognize common variations in the anatomy of the biliary tract and to perform careful dissection of the vital structures during surgery [1, 8, 9]. In a small number of patients if excessive scarring is present or the anatomy of the structures is not clear then for safety reasons the surgeon may decide to convert the operation to an open surgical operation through a traditional large surgical incision. Conversion rates (CR) to open cholecystectomy (OC) have been reported previously as 5-15% in elective cases, and up to 25% in patients with acute cholecystitis [10]. The decision to convert to an open operation is strictly based on patient safety. Factors that may increase the risk of converting to the "open" procedure include obesity, a history of prior abdominal surgery causing dense scar tissue, acute cholecystitis or bleeding problems during the operation [7]. Complications of a laparoscopic cholecystectomy are infrequent and the vast majority of laparoscopic gallbladder patients recover and quickly return to normal activities. Some of the complications that can occur include bleeding, infection, and leakage of bile in the abdomen, pneumonia, blood clots, or heart problems. Surgical injury to adjacent structures such as the common bile duct, duodenum or the small intestine may occur rarely and may require another surgical procedure to repair it. If the gallbladder is accidentally or deliberately opened during the procedure stones may fall out of the gallbladder and in to the abdomen that may give rise to later scarring [,11,12,13,14,15]. In our study From 100 patients in whom was done laparoscopic cholecystectomy at 3 or 3.0% patient had become to conversion in laparotomy due to Mirizzi syndrome (one patient), fistula between gallbladder and stomach (one patient) and choledocholithiasis (1 patient) . The cholecystectomy may be performed laparoscopically is best options except complicated and delayed cases that increase risk to convert to the open surgery. Surgeons are still following the old habit of routine subhepatic drainage following laparoscopic cholecystectomy (LC) [13]. Routine subhepatic drainage after LC In our experience is not necessary in uncomplicated cases. . In our study, Intervention with laparoscopic method is minimal invasive, with shorter hospitalization 1, 5 days despite 6.8 day with classical method. Time duration of the operation is shorter with laparoscopic method 45.2 minutes, while the classical method 60.5 minutes. Time to return to work for patients treated with laparoscopic method is 30 days, while the classical method is 60 days. Total costs for the treatment of a patient with a new technique are lower than with the older techniques. Overall operations for acute cholecystitis are associated with slightly higher mortality and morbidity rates

compared with those with chronic cholecystitis, often as a result of underlying cardiovascular, pulmonary, or metabolic disease [1].

## Conclusions

Incisions for introducing gates are tiny at laparoscopic methods and damage to the skin, muscles, subcutaneous elements are minimal, whereas at classical methods these injuries are evident. The possibility of exploration of the abdominal organs and identification of callus triangle elements is greater at laparoscopic method than classical method. The good results with minor complication and rare decision to convert to an open operation, come to be allowing us to recommend these minimally invasive procedures in suitable patients.

## References:

1. Rudy G. Danzinger et al. Gallstone disease In: Peter F. Lawrence et al ( Fourth edition): Essentials of General Surgery Lippincott Williams&Willkins 2006.pp. 335-351.
2. Litwin DE, Cahan MA. Laparoscopic cholecystectomy. *Surg Clin North Am.* Dec 2008;88(6):1295-313
3. Calland JF, Tanaka K, Foley E, Bovbjerg VE, Markey DW, Blome S, et al. Outpatient laparoscopic cholecystectomy: patient outcomes after implementation of a clinical pathway. *Ann Surg.* May 2001; 233(5):704-15.
4. Shea JA, Berlin JA, Bachwich DR, Staroscik RN, Malet PF, McGuckin M. Indications for and outcomes of cholecystectomy: a comparison of the pre and postlaparoscopic eras. *Ann Surg.* Mar 1998; 227(3):343-50.
5. Adams DB. The importance of extrahepatic biliary anatomy in preventing complications at laparoscopic cholecystectomy. *Surg Clin North Am.* Aug 1993;73(4):861-71.
6. National Institutes of Health (NIH). Gallstones and Laparoscopic Cholecystectomy. NIH Consensus Statement. NIH; September 14-16, 1992. 10(3):1-28
7. S Duca, O Bălă, F Graur. Laparoscopic cholecystectomy: incidents and complications. A retrospective analysis of 9542 consecutive laparoscopic operations HPB(Oxford).2003;5(3):152-158
8. Lillemoe KD, Lin JW, Talamini MA, Yeo CJ, Snyder DS, Parker SD. Laparoscopic cholecystectomy as a "true" outpatient procedure: initial experience in 130 consecutive patients. *J Gastrointest Surg.* Jan-Feb 1999;3(1):44-9.

9. Cook J, Richardson J, Street A. A cost utility analysis of treatment options for gallstone disease: methodological issues and results. *Health Econ* 1994; 3:157–168.
10. To KB, Cherry-Bukowiec JR, Englesbe MJ, Terjimanian MN, Shijie C, Campbell DA Jr, Napolitano LM. Emergent versus Elective Cholecystectomy: Conversion Rates and Outcomes. Outcomes of cholecystectomy for treatment of acute cholecystitis in octogenarians. *Surg Infect (Larchmt)*. 2013 Dec; 14(6):512-9. doi: 10.1089/sur.2012.
11. Ozkardeş AB, Tokaç M, Dumlu EG, Bozkurt B, Ciftçi AB, Yetişir F, Kılıç M. arly versus delayed laparoscopic cholecystectomy for acute cholecystitis: a prospective, randomized study. *Int Surg*. 2014 Jan-Feb;99(1):56-61. doi: 10.9738/INTSURG-D-13-00068.1. 160
12. Naraynsingh V, Singh Y, Dan D, Maharaj R. Expertise-based randomized clinical trial of laparoscopic versus small-incision open cholecystectomy (Br J Surg 2013; 100: 886-894).
13. Shamim M. Routine Sub-hepatic Drainage versus No Drainage after Laparoscopic Cholecystectomy: Open, Randomized, Clinical Trial. *Indian J Surg*. 2013 Feb; 75(1):22-7. doi: 10.1007/s12262-012-0452-5
14. Deziel DJ, et al. Complications of laparoscopic cholecystectomy: A national survey of 16,292 hospitals and an analysis of 77,604 cases. *Am J Surg*. 1993;165:9-13.

### **Authors' Contribution**

Afrim Avdaj did surgery of patients and helped in writing the paper. Nexhmi Hyseni was responsible for conception and editing of paper. Mehmet Maxhuni, Nikollaq Kacani, Agron Bytyqi, and Fjolla Hyseni were responsible for literature search and preparation of paper.

All authors read and approved the final paper.