



ACUTE APPENDICITIS-LAPAROSCOPIC AP- PENDECTOMY AND REASONS FOR CONVER- SION

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SUMMARY

Purpose: The purpose of this study is to analyze the efficacy of laparoscopic appendectomy, its advantages and disadvantages and the cause of conversion in patients with acute appendicitis.

Material and Methods: Data from 128 patients with acute appendicitis, operated laparoscopically, was processed by a retrospective clinical analysis for the period of 1.5. 2017 to 31.12. 2017 in the General, Visceral and Emergency Surgery Section of the UMHATEM "Pirogov". Of the hospitalized, women were 73 (57.03%), men 55 (42.97%). The age in this retrospective analysis varied from 18 to 74 years (average 35.2 years).

Results: The laparoscopy time interval was 27-119 minutes. The conversion included a total of 10 cases (7.81%). The hospital stays varied from 2 to 7 days. Morbidity rate was 4.69%. Mortality- 0%

Conclusions: Laparoscopic approach has been identified as a method of choice in patients with acute appendicitis because of advantages of low levels of morbidity, the diagnosis and treatment of accidentally discovered other pathological findings, the earlier return to normal activity, the excellent cosmetic results and the reduced post-operative therapy.

Keywords: acute appendicitis, laparoscopy, approach, conversion, adhesion,

INTRODUCTION

Laparoscopic appendectomy has evolved since the first performed by a German gynecologist Kurt Semm (1983). It has gained acceptance as a diagnostic and treatment method for acute appendicitis with the technological advances of the past two to three decades. Since then, this procedure has been widely used. In spite of its wide acceptance, there remains a continuing controversy in the literature regarding the most appropriate way of removing the inflamed appendix because of a set of new operative complications relating to laparoscopic surgery. Minimal access surgery has been proved to be a useful surgical technique. The application of recent technology and skills can now provide a better and cheaper choice of treatment.

The frequency of appendicitis in industrialized countries is around 7%. In the US, it is 300,000 cases per

year. Most commonly, it occurs in patients in the second and third decades of their life. Diagnosing acute appendicitis is difficult. During their reproductive years in women, it is estimated that about 40% are not diagnosed properly. Moreover, in 20 to 30% of cases, patients show clinical symptoms of acute appendicitis without any evidence of this [1].

Many advantages of the laparoscopic appendectomy have been proven over the classic approach - open surgery. These are small incisions, good visualization and better access to abdominal organs as well as rapid recovery in the postoperative period. However, some of the studies show a threefold greater incidence of intra-abdominal abscesses relative to open appendectomy [2]. This occurs more often in complicated acute appendicitis [3]. Still, the use of laparoscopy in complicated appendicitis remains debatable [4]. Considering the advantages and disadvantages, the laparoscopic appendectomy [5] is the preferred method of surgical treatment of acute appendicitis.

The **aim** of our study is to analyze the efficacy of laparoscopic appendectomy, its advantages and disadvantages and the cause of conversion in patients with acute appendicitis.

MATERIAL AND METHODS

Data from 128 patients with acute appendicitis, operated laparoscopically, was processed within a retrospective clinical analysis for the period of 1.5. 2017 to 31.12. 2017 in the General, Visceral and Emergency Surgery Section of the UMHATEM "Pirogov". The clinical diagnosis was based on history, physical examination, laboratory results, radiography, echography and CT. Pre-operative fever, leukocytes, right lower quadrant pain, right lower quadrant tenderness, nausea, vomiting and anorexia were recorded. Time until return to work or normal activities was determined by examination of the post-operative out-patient medical records and by a one month post-operative follow up interview.

The laparoscopic technique was performed after a Hasson trocar was placed through the umbilical scar with the open technique. The camera was introduced into the abdomen through this trocar, two more trocars were positioned. The first one (5-mm) was placed in the midline just

above the pubis and the second one (10 mm) in the left iliac fossa, in a point on the left-side perfectly symmetrical to the McBurney point. The appendicular artery was coagulated with bipolar electrocautery. The procedure was completed by using two endoloops (ready-made or hand-made) and the appendix extracted with an endobag. The patients were discharged after the passage of flatus.

Of the hospitalized women were 73 (57.03%), men 55 (42.97%). In this study, the parameters - age, gender distribution, clinical symptoms, mode of treatment, morbidity and mortality were analyzed. The age in this retrospective analysis varied from 18 to 74 years (average 35.2 years). The frequency of conversion and the reasons for this - the duration of operation, intraoperative pathology, anatomical variations of the appendix, blood loss and dense postoperative or embryonic peritoneal adhesions were analyzed.

Patients under 18 years of age, with more than one previous abdominal surgery and diffuse peritonitis, were excluded from the study.

The data from all patients admitted with acute appendicitis were carefully systematized, analyzed and summarized. The results are summarized by tracking the morbidity up to one month after discharge.

RESULTS

Surgically diagnosed - 82 of the patients had phlegmonous appendicitis (64.06%), 31 with gangrenous appendicitis (24.22%) and 15 cases with perforation (11.72%). The pathological examination in 11 of the cases found a normal appendix (7.91%). They were excluded from the study. (Table 1).

Table 1. Pathological examination of the appendix

Pathological examination of the appendix	(%)
phlegmonous appendicitis	82(64.06%)
gangrenous appendicitis	31(24.22%)
gangrenous appendicitis with perforation	15(11.72%)
normal appendix	11(7.91%)

The laparoscopy time interval was 27-119 minutes, and in case of prolonged operation, the conversion time was also included. The main reasons for this were haemorrhage of the mesoappendix, technical reasons, dense adhesions, typhlitis, anatomical variations, bowel lesion susceptibility - a total of 10 cases (7.81%). After analysis and assessment, the reasons for the conversion performed were as follows-haemorrhage of the mesoappendix one patient; in 5 cases due to phlegmonous typhlitis; in retro-caecal localization 3; and in 1 patient-due to a lesion of the bowel (Table 2).

Table 2. Reasons for conversion

Reasons for conversion	10 (7.81%)
haemorrhage of the mesoappendix	1 (0.78%)
phlegmonose typhlitis	5 (3.91%)
retro-caecal localization	3 (2.34%)
lesion of the bowel	1 (0.78%)

The hospital stays varied from 2 to 7 days.

Postoperative complications (Table 3) were recorded in 6 cases (4.69%) - wound infection in 4 (treated with VAC dressing), in 1 patient postoperative hernia in the umbilical port, and in another intra-abdominal abscess (PTC drained). Antibiotic therapy was given to 113 patients (88.28%) and in cases of perforation and intra-abdominal abscess antibiotic combination was optimized.

Table 3. Postoperative complications

Postoperative complications	6 (4.69%)
wound infection	4 (3.13%)
postoperative hernia in the umbilical port	1(0.78%)
intra-abdominal abscess	1(0.78%)

There were no deaths; therefore, mortality was 0%.

DISCUSSION

Due to the laparoscopic approach to acute appendicitis, there is evidence of a significant reduction in postoperative pain resulting in lower doses of analgesics; short hospital stay; fast recovery; reduction of the hospital and non-hospital expenses; low levels of complications and last but not least much better cosmetic results.

On the other hand, in cases that need conversion, it increases operative time and hence the cost of anaesthesia. Factors for conversion are dense embryonic or postoperative adhesions, complicated localization (anatomic variation), bleeding, a severe intraoperative finding of complicated forms of appendicitis [5], iatrogenic lesion of adjacent organ, technical reasons and lack of experience in laparoscopic surgery. For these reasons, it is necessary to optimize the choice of acute appendicitis approach individually for each patient.

Some of the studies highlight the fact that laparoscopic appendectomy has a significant increase in intra-abdominal abscesses [2, 3]. But the underlying causes are complicated forms of acute appendicitis and do not correlate with the choice of a laparoscopic approach. Another reason is the technical misconduct of surgery or the surgeon's little experience in laparoscopic surgery. Furthermore, the treatment of postoperative intra-abdominal abscesses is conservative with antibiotics, and PTC drainage

and no re-operative intervention is required in most cases.

An important advantage of laparoscopic surgery is the lack of postoperative adhesions in the intervention region. This does not create preconditions for post-operative ileus [6], readmission and possible reoperation. This approach also saves the potential hospital costs associated with this and, last but not least, gives better cosmetic results.

Laparoscopic appendectomy was found relatively safe and resilient procedure. We had an additional benefit of laparoscopic surgery. It revealed the diagnostic tool in patients misdiagnosed as having appendicitis. Though there was no comparative group, it was apparent that the laparoscopic approach was proved to have reduced pain, less complication and shorter hospital stay. [7, 8, 9, 10].

CONCLUSION

A number of advantages of the laparoscopic approach, proven by postoperative results, have identified it as a method of choice in patients with acute appendicitis. These are the low levels of morbidity, the diagnosis and treatment of accidentally discovered other pathological findings, the earlier return to normal activity, the excellent cosmetic results and the reduced postoperative therapy.

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REFERENCES:

1. Azaro EM, Amaral PC, Ettinger JE, Souza EL, Fortes MF, Alcantara RS, et al. Laparoscopic versus open appendectomy: a comparative study. *JSLS*. 1999 Oct-Dec;3(4):279-83. [PubMed]
2. Abe T, Nagaie T, Miyazaki M, Ochi M, Fukuya T, Kajiyama K. Risk factors of converting to laparotomy in laparoscopic appendectomy for acute appendicitis. *Clin Exp Gastroenterol*. 2013 Jul 4;6:109-14. [PubMed] [Crossref]
3. Pokala N, Sadhasivam S, Kiran RP, Parithivel V. Complicated appendicitis—is the laparoscopic approach appropriate? A comparative study with the open approach: outcome in a community hospital setting. *Am Surg*. 2007 Aug;73(8):737-41; discussion 741-2. [PubMed]
4. Garg CP, Vaidya BB, Chengalath MM. Efficacy of laparoscopy in complicated appendicitis. *Int J Surg*. 2009 Jun;7(3):250-2. [PubMed] [Crossref]
5. Andersson RE. Short-term complications and long-term morbidity of laparoscopic and open appendectomy in a national cohort. *Br J Surg*. 2014 Aug;101(9):1135-42. [PubMed] [Crossref]
6. Yau KK, Siu WT, Tang CN, Yang GP, Li MK. Laparoscopic versus open appendectomy for complicated appendicitis. *J Am Coll Surg*. 2007 Jul;205(1):60-5. [PubMed] [Crossref]
7. Augustin G, Cizmesija Z, Zedelj J, Petrović I, Ivković V, Antabak A, et al. Laparoscopic Appendectomy does not Increase the Rate of Negative Appendectomy along with a Lower Rate of Perforated Appendicitis – Results in 1899 Patients at Zagreb UHC. *Acta Clin Croat*. 2018 Sept;57(3):503-509. [PubMed] [Crossref]
8. Dowgiallo-Wnukiewicz N, Kozera P, Wójcik W, Lech P, Rymkiewicz P, Michalik M. Surgical treatment of acute appendicitis in older patients. *Pol Przegl Chir*. 2019 Feb;91(2):12-15. [PubMed] [Crossref]
9. Pedziwiatr M, Lasek A, Wysocki M, Mavrikis J, Mysliwiec P, Bobowicz M et al. Complicated appendicitis: Risk factors and outcomes of laparoscopic appendectomy - Polish laparoscopic appendectomy results from a multicenter, large-cohort study. *Ulus Travma Acil Cerrahi Derg*. 2019 Mar;25(2):129-136. [PubMed] [Crossref]
10. Reiter AJ, Schlottmann F, Kajombo C, Gallaher J, Charles AG. Surgical Outcomes of Acute Appendicitis in High- Middle- and Low-Income Countries. *Am Surg*. 2019 Feb;85(2):97-99. [PubMed]

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