

Research Article

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Acute Catarhal Appendicitis — Diagnosis and Treatment

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RELEVANCE At present, despite the dynamic progress in urgent abdominal surgery, based on the introduction of advances in medical technology and, as a consequence, the development of non-invasive and minimally invasive diagnostic and treatment technologies, the problem of diagnosis and treatment of the catarrhal form of acute appendicitis (acutis appendicitis forma catarrhalis) remains relevant.

THE AIM was to improve the outcomes of endovideolaparoscopic appendectomy by optimizing the differentiation of pathomorphological forms of acute appendicitis based on the results of non-invasive and minimally invasive diagnostic and treatment methods.

MATERIAL AND METHODS In the surgical department of the Al-Mozn Medical Complex (Arab Republic of Libya), 182 patients underwent appendectomy using endovideolaparoscopic technology from 2019 to 2024. This work is based on the analysis of 128 patients who underwent appendectomy using endovideolaparoscopic technology; in 54 (29.7%) patients out of 182, the surgical technique had distinctive features that were the subject of further research. 24 patients with different abdominal surgical pathology, surgical correction of which was possible using endovideolaparoscopic access, were examined to assess the non-inflamed appendix (according to ultrasound and endovideolaparoscopy) as a comparison group.

RESULTS 22 (17.2%) patients were diagnosed with the catarrhal form (acutis appendicitis forma catarrhalis), 89 (69.5%) with the phlegmonous form (acutis appendicitis forma phlegmonous), and 17 (13.3%) with the gangrenous form (acutis appendicitis forma gangreno). A total of 128 (100%) patients.

CONCLUSIONS Inconsistency of symptoms in the group of patients with acute catarrhal appendicitis complicates primary clinical diagnosis. The results of non-invasive diagnostic methods showed that the sensitivity of ultrasound was 87.6%; however, this method of research is ineffective in identifying the catarrhal form. The degree of effectiveness of ultrasound is directly proportional to the destructive changes in the appendix. The diagnostic accuracy of endovideolaparoscopy is 96%. This diagnostic method is effective and preferable in diagnosing the catarrhal form.

Keywords: acute appendicitis, diagnostic endovideolaparoscopy, endovideolaparoscopic appendectomy, acute “catarrhal” appendicitis

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RELEVANCE

Despite the positive changes in urgent abdominal surgery based on the introduction of non- and minimally invasive diagnostic and treatment technologies, the problem of the "catarrhal" form of acute appendicitis (acutis appendicitis forma catarrhalis) requires additional research. This situation is directly related to the incidence rate - 22.8 per 10,000 population [1], and of all those operated on, emergency appendectomy accounts for 40% [2]. According to E. Young et al., A.Sh. Revishvili et al., 50 to 70 thousand people die annually worldwide from this pathology and its complications [3,4].

A number of researchers in the diagnosis of acute appendicitis emphasize the effectiveness of ultrasound examination, and believe that the number of errors at the diagnostic stages without the use of modern non-invasive and minimally invasive diagnostic methods reaches 31%, the frequency of unjustified appendectomies is 35–40%, and the incidence of postoperative complications remains high (32.3–50%). At the early stages of inflammation of the appendix, low reliability of ultrasound is observed - up to 50–63%, while in destructive forms it reaches 92–96% [5].

As for computed tomography, the accuracy of this study in diagnosing acute appendicitis is 94–100% [6]. It is generally accepted that when differential diagnostic difficulties arise in acute appendicitis, diagnostic laparoscopy is performed. Endovideolaparoscopy has an accuracy of up to 92.0–95.8%, and this examination also reduces the number of diagnostic errors [7].

Since 1983, laparoscopic appendectomy has gained wide popularity, and as a result, up to 75% of operations in the world are performed laparoscopically. Moreover, some authors advocate granting laparoscopic appendectomy the status of a "gold standard" [8]. At the same time, in the Russian Federation, according to A.Sh. Revishvili (2019), the frequency of use of endovideolaparoscopic technologies in the surgical treatment of acute appendicitis is 27% [9]. It should be added that, according to I.I. Zatevakhin (2020), the introduction

and spread of laparoscopic appendectomy is hampered by low motivation [10].

The problems of acute appendicitis are considered in national and international recommendations of surgical societies [11]. The discussions touched upon issues related to determining tactics in complex clinical situations; however, there are no specific decisions regarding the catarrhal form of acute appendicitis (acutis appendicitis forma catarrhalis) [12, 13]. At the same time, we must remember that acute appendicitis is a clinical diagnosis, and the clinical picture of this pathology, combined with the results of diagnostic methods, determines the vector of tactical management and treatment.

The aim of the study was to improve the results of endovideolaparoscopic appendectomy by optimizing the differentiation of pathomorphological forms of acute appendicitis based on the outcomes of noninvasive and minimally invasive diagnostic and treatment methods.

Objective: Based on the obtained data from the analysis of clinical material, to specify indications for appendectomy in the catarrhal form of acute appendicitis using endovideolaparoscopic access.

MATERIAL AND METHODS

In the surgical department of the Al-Mozn Medical Complex (Arab Republic of Libya), 182 patients underwent appendectomy using endovideolaparoscopic technology from 2019 to 2024. The present work is based on the analysis of observations of 128 patients who underwent appendectomy using endovideolaparoscopic technique, while in 54 patients (29.7%) the technique of performing operations had distinctive features, and they are the object of our further research. Additionally, 24 patients with different abdominal surgical pathology, surgical correction of which was possible using endovideolaparoscopic access, were examined to assess the non-inflamed appendix (according to ultrasound and endovideo-laparoscopy data) as a comparison group with a group of patients diagnosed with acute catarrhal appendicitis.

The patient contingent underwent a comprehensive examination. The examination

spectrum included: the diagnostic period – clinical and laboratory examination and ultrasound (a Sonoscape P20 doppler ultrasound scanner, Germany); multispiral computed tomography (MSCT) (a General Electric CT scanner manufactured in the USA, 2022), and endovideodiagnostic laparoscopy, if indicated. Surgical interventions were performed using COMEG endoscopy devices (Japan), and Karl Storz endoscopic instruments (Germany). Histopathological examinations were carried out at a Attasami Diagnostic Services diagnostic center, Tripoli, Libya. Statistical processing included calculation of extensive indicators. The patient age range was from 16 to 64 years. The patient contingent by gender: men - 71 (55.5%), women - 57 (44.5%).

RESULTS AND DISCUSSION

Analyzing the clinical material, we identified the periods of the diagnostic and treatment process. The first period was a clinical examination to identify parallels between the clinical picture and surgical findings, which made it possible to generalize the clinical picture depending on the pathomorphological diagnosis.

According to the data presented in Fig. 1, 22 patients (17.2%) had the catarrhal form (acutus appendicitis forma catarrhalis), 89 (69.5%) had the phlegmonous form (acutus appendicitis phlegmonous), and 17 (13.3%) had the gangrenous form (acutus appendicitis forma gangreno) of appendicitis. The proportion of destructive forms (acutus exitiabilis appendicitis) was 82.8% – 106 out of 128 patients (100%).

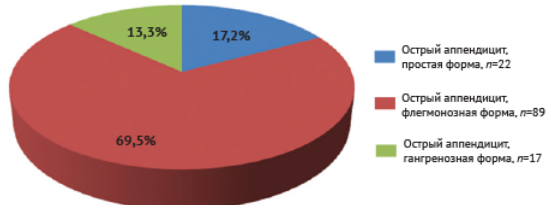


Fig. 1. Distribution of patients by pathomorphological diagnosis

The next stage of the examination was the use of ultrasound of the abdominal cavity. It should be noted that in the comparison group, consisting of 24

patients, the appendix was visualized in 19 (79.2%) (Fig. 2). The general characteristics were as follows: the cross-sectional diameter averaged 5.5 mm, the layering of the wall was visualized, mobility was preserved when pressing with the sensor, rigidity and pain were absent, the nature of the contents could not be determined; classic ultrasound signs of acute inflammation were absent. There were no changes in vascularization, according to color Doppler and energy blood flow mapping. The ultrasound picture of acute inflammation of the appendix is shown in Fig. 3. Classic ultrasound signs are well known and described in periodical literature. The sensitivity of ultrasound in our patients was 87.6%. The results of the studies allow us to conclude that the degree of effectiveness of ultrasound is directly proportional to the destructive changes in the appendix.

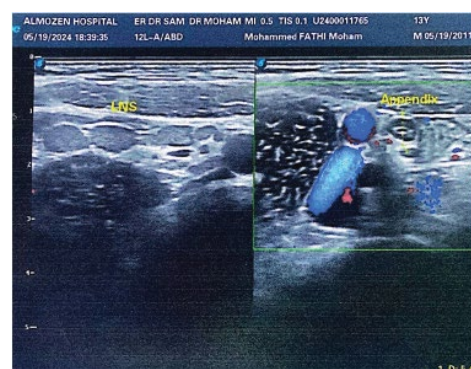


Fig. 2. Ultrasound image of the appendix without signs of inflammation

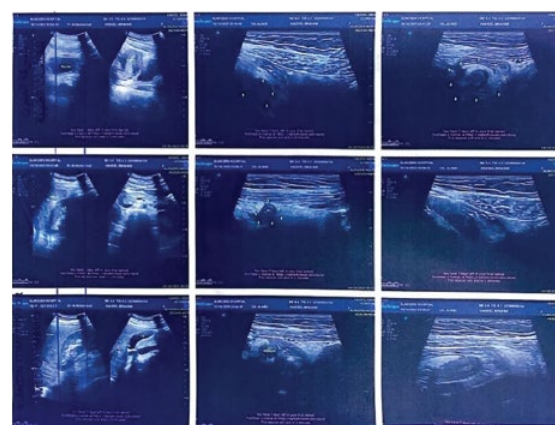


Fig. 3. Ultrasound image of the appendix with signs of inflammation

Multispiral computed tomography (MSCT) was used to examine 43 patients. In 28 of them (65.1%), signs of acute appendicitis were detected, while in 15 (34.9%) this diagnosis was excluded. The obtained digital data confirm the high diagnostic efficiency of the method. Indications for the use of MSCT are clinically complex and difficult to diagnose cases.

At the diagnostic stage of surgery, in difficult situations, a second 5-mm trocar was installed for the manipulator along the midline 3–4 cm below the navel, taking into account that in the presence of signs of appendicitis it was possible to perform an appendectomy..

In the Comparison group, the endovideolaparoscopy data at the stage of visual revision showed that the appendix was subject to examination in all cases, its mobility was preserved, it lay freely in the right iliac region, and its course was tortuous. There was no tension or rigidity, as well as ampulla-shaped thickenings along the entire length of the appendix, the serous membrane was not changed, without pathological visual signs of inflammation, its vessels were not injected, the mesentery along the vermiform appendix was not edematous, of normal thickness.

There was no adhesion process or pathological fluid in the visual inspection area (Fig. 4). This condition of the appendix subsequently served as a starting point for assessing its changes.

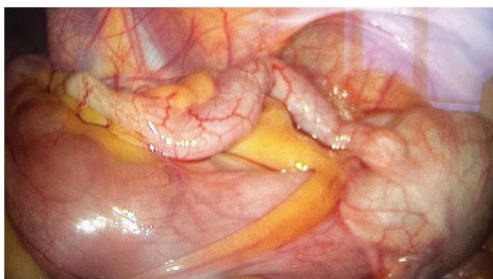


Fig. 4. Intact vermiform appendix

Endovideolaparoscopic signs of the catarrhal form of acute appendicitis (acutis appendicitis forma catarrhalis) were hyperemia, pinpoint hemorrhages on the serosa and swelling of the mesentery (Fig. 5).



Fig. 5. Catarrhal form of acute appendicitis

Indirect signs were the presence of effusion in the right iliac fossa and small pelvis, hyperemia of the parietal peritoneum (Fig. 6). Multiple optical magnification of the “zone of interest” obtained using endovideolaparoscopic technology increases the degree of effectiveness of differentiation of signs of inflammation.

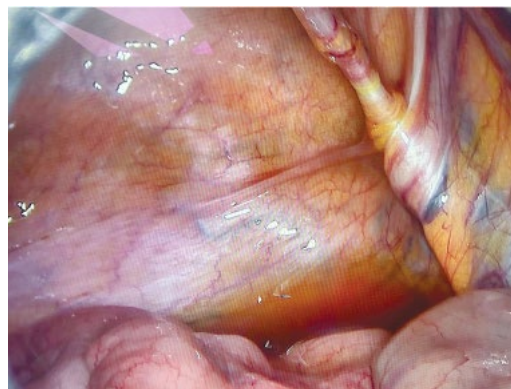


Fig. 6. Effusion in the abdominal cavity

In destructive forms of acute appendicitis, endovideolaparoscopic diagnosis in the absence of adhesive infiltrate does not present any particular difficulties. For example, Fig. 7 shows a picture of phlegmonous appendicitis, where in some cases there are ampulla-shaped expansions, more often in the apical part, of the empyema type. Fig. 8 shows a case of gangrenous appendicitis.



Fig. 7. Acute appendicitis, phlegmonous form. Empyema of the appendix

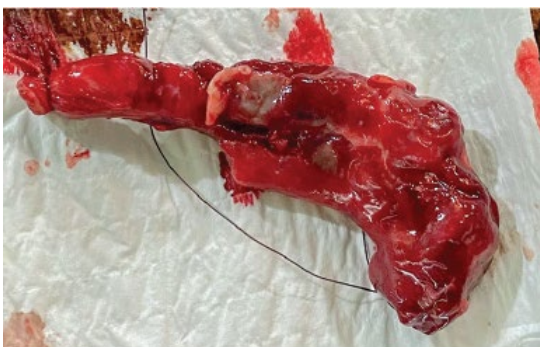


Fig. 8. Acute appendicitis, gangrenous form

After visual revision was completed, additional trocars were installed. Each port localization option was used depending on the intra-abdominal situation.

Appendectomy was performed using antegrade and retrograde methods or their combination. The mobilization of the appendix from adhesions was performed with an endo-hook under the cover of bi- and monopolar coagulation; clipping or the Roeder's knot were used when treating the mesentery of the

appendix. The stump was ligated twice. In destructive forms of the appendix with local or diffuse peritonitis, mandatory sanitation and drainage of the abdominal cavity were performed.

Patients were discharged on the 4th–6th day. In the postoperative period, suppuration at the trocar insertion point was noted in 6 patients (4.7%).

CONCLUSION

The inconsistency of symptoms in the group of patients with acute catarrhal appendicitis complicates the primary clinical diagnosis.

The results of non-invasive diagnostic methods showed that the sensitivity of ultrasound examination was 87.6%; however, this method of examination is ineffective in identifying the catarrhal form. The degree of effectiveness of ultrasound examination is directly proportional to the destructive changes in the appendix. The diagnostic accuracy of endovideolaparoscopy was 96%. This diagnostic method is effective and preferred in the diagnosis of the catarrhal form.

In our opinion, the use of endovideolaparoscopy will allow surgeons, upon confirmation of the diagnosis, to perform appendectomy by laparoscopic access, i.e. simultaneously solve the problem of surgical correction of acute appendicitis. This provision helps optimize diagnosis and reduce the diagnostic period.

Clinical manifestations of acute appendicitis, together with the results of diagnostic methods, determine the vector of the direction of the patient's management and treatment tactics.

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