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Appendectomy and Resection of the Terminal Ileum with Secondary Severe Necrotic Changes in Acute Perforated Appendicitis

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
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Patient: Female, 19
Final Diagnosis: Acute perforated appendicitis • appendiceal abscess • secondary necrosis of the ileal wall
Symptoms: Right lower quadrant abdominal pain • fever
Medication: —
Clinical Procedure: Diagnostic laparoscopy • open drainage of an appendiceal abscess • appendectomy • ileal resection
Specialty: Surgery

Objective: Management of emergency care

Background: Resectional procedures for advanced and complicated appendicitis are performed infrequently. Their extent can vary: cecal resection, ileocecectomy, and even right hemicolectomy. We present a very rare case of appendectomy that was combined with partial ileal resection for severe necrotic changes and small perforation of the ileum.





Case Report: A 19-year-old female patient was hospitalized with right iliac fossa pain and fever 10 days after the onset of symptoms. On laparoscopy, a large mass in a right iliac fossa was found. The ultrasound-guided drainage of the suspected appendiceal abscess was unavailable. After conversion using McBurney's incision, acute perforated appendicitis was diagnosed. It was characterized by extension of severe necrotic changes onto the ileal wall and complicated by right iliac fossa abscess. A mass was bluntly divided, and a large amount of pus with fecaliths was discharged and evacuated. Removal of necrotic tissues from the ileal wall led to the appearance of a small defect in the bowel. A standard closure of this defect was considered as very unsafe due to a high risk of suture leakage or bowel stenosis. We perform a resection of the involved ileum combined with appendectomy and drainage/tamponade of an abscess cavity. Postoperative recovery was uneventful. The patient was discharged on the 15th day.

Conclusions: In advanced appendicitis, the involved bowel resection can prevent possible complications (e.g., ileus, intestinal fistula, peritonitis, and intra-abdominal abscess). Our case may be the first report of an appendectomy combined with an ileal resection for advanced and complicated appendicitis.

MeSH Keywords: Abdominal Abscess • Appendicitis • Intestine, Small

Abbreviations: RPs – resectional procedures

Full-text PDF: <http://www.amjcaserep.com/abstract/index/idArt/892471>

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Background

For advanced perforated appendicitis, especially in long duration of the disease, the standard technique of the appendectomy may not be sufficiently effective for prevention of subsequent complications (e.g., intestinal fistula, peritonitis, intra-abdominal abscess, and acute intestinal obstruction). For such cases, certain authors noted a high efficacy of various resectional procedures (RPs): cecal resection, ileocectomy, and even right hemicolectomy [1–6]. These operations are characterized by removal of not only the vermiform appendix, but of neighboring organs secondarily involved in the pyonecrotic process, which can sometimes be very advanced and severe. This approach, related to radical removal of the inflammatory focus, can reliably prevent septic complications caused by progression of the inflammation in the right lower quadrant of the abdomen.

In certain institutions, experience with the RPs for destructive appendicitis is substantial, and their results are characterized as positive [2,3,5,6]. However, in most clinics RPs are used rarely – only in those cases when it is impossible to intraoperatively distinguish destructive appendicitis and colon-ic or appendiceal neoplasm [1,4,7,8].

Recently, we encountered a very rare clinical case: the secondary destructive and inflammatory changes of the terminal ileum that developed in 10-day acute appendicitis were so severe that resection of the involved bowel was necessary. The case is presented below.

Case Report

A previously healthy 19-year-old Russian female patient was urgently admitted to the hospital 29.04.2011 with severe pain in the right lower quadrant of the abdomen and fever. Onset of the symptoms was 10 days before hospitalization. On the day of admission, the pain increased and temperature reached 39°C. Initially, the patient was admitted to the infectious disease hospital, and after exclusion of the infectious disease she was transferred to multidisciplinary hospital, with a preliminary diagnosis of “torsion of the right ovarian cyst”. She was examined by a gynecologist, and the above diagnosis was confirmed. Ultrasound examination revealed an ovoid mass 7×5 cm with a thin wall and non-homogenous liquid contents, described as “very suspicious for ovarian cyst torsion”. A transvaginal ultrasound was desirable but was unable to be performed due to the patient’s virginity. The patient was hospitalized in the gynecological department without a surgical consultation. An urgent surgical intervention was scheduled.

At the laparoscopic revision, pathologic changes of the genitalia were not found. A large mass in the right iliac fossa was

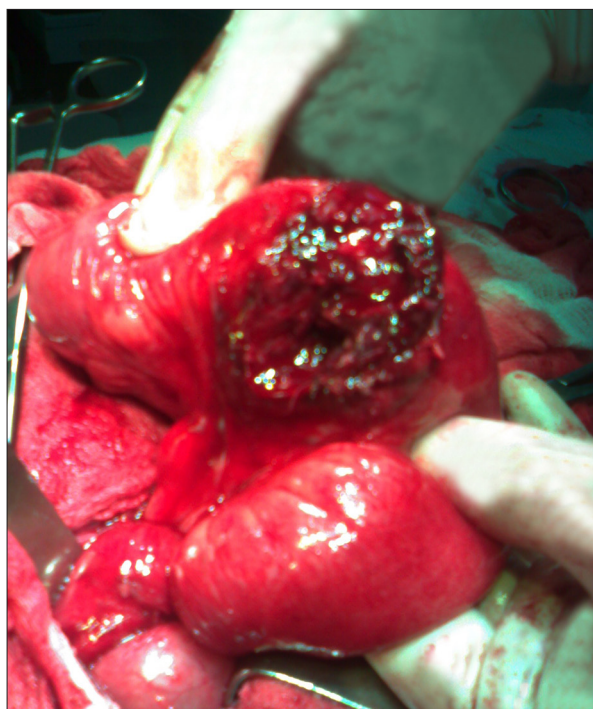


Figure 1. A terminal ileum with severe inflammatory and necrotic changes secondarily to 10-day perforated appendicitis complicated by a large periappendiceal abscess.

diagnosed. Consultation with a surgeon was requested, and indications for laparotomy were established. At that time, the ultrasound-guided drainage of the suspected appendiceal abscess was unavailable. It had been taken into account that the patient was admitted to the hospital complaining on increasing pain and fever. These symptoms were regarded as very dangerous for a potential abscess rupture into a free abdominal cavity. All these circumstances have led us to the decision to choose an open surgery. The abdomen was opened by a McBurney’s incision. A large mass in the right iliac fossa and in the pelvis, including cecum, terminal ileum, and major omentum, was detected. This mass was divided bluntly, and a large amount of pus with fecaliths and tissue debris was discharged and evacuated. Due to large size of fecaliths, we avoided the simple abscess drainage in favor of appendectomy, considering a high risk of the fecal fistula (considering the wide lumen of the appendix). Only a small part of the vermiform appendix was present (about 3.5 cm from its base) and the remainder was completely necrotized. The existing part of the appendix was mobilized and removed. Its stump was peritonized by a fold of the lateral cecal wall because the bowel wall around the appendiceal stump was very hard and rigid and was not suitable for a stump closure. The wall of the ileum and its mesentery about 15 cm from the ileocecal junction was severely inflamed as a result of tight contact with the necrotized appendix, with formation of 5×2 cm necrotic area (Figure 1). On

the surface of this area, non-viable tissues were clearly seen. In the process of their separation from the bowel wall, a small all-layer defect of the ileum was formed, despite very careful handling. It was detected by leakage of small air bubbles. Due to severe inflammation of the bowel wall, closure of this defect by single or single-row suture was unreliable and 2-row suture leads to substantial narrowing and obstruction of the intestine. In this situation, we prefer to perform a resection of the part of the ileum with necrotic tissues and perforation. The length of the resected bowel was 7–8 cm. An end-to-end anastomosis was created using 2 rows of 4/0 Vicryl sutures. The right iliac fossa and pelvis were irrigated with antiseptic solution (nitrofurantoin 1:5000). The abscess cavity was drained by 1 tampon and 1 rubber tube, and the pelvis was drained by an additional tube. The wound was closed layer-by-layer, except for the tamponade area.

The postoperative period was uneventful. On the 7th day, the tampon in the periappendiceal abscess cavity was replaced by a new one, under general anesthesia. The wound healed primarily. Digestive function recovery was timely and satisfactory. The patient was discharged on the 15th day. Histological examination showed phlegmonous-necrotic changes in both the appendix and resected bowel. Three years after surgery, the patient is well, without complaints. Her general health is good.

Discussion

The weakest point of surgery for advanced destructive appendicitis, usually complicated by periappendiceal/pericecal abscess, is the peritonization of the appendiceal stump. The very rigid, inflamed cecal wall around the appendiceal stump cannot be used for a reliable stump inversion. In those cases, the risk of development of suture leakage and, consequently, intra-abdominal abscess or peritonitis, is substantial. Extension of gross inflammation and necrosis outside the area of the appendix can lead to delayed abscess or fistula formation even in consistent stump sutures. Another serious complication of appendectomy for advanced appendicitis is early postoperative ileus.

These complications can be prevented by the RP with removal of the organs secondarily involved in severe inflammatory/necrotic processes. The extent of the RP can vary from a limited cecal resection to a right hemicolectomy. The most important condition for success of such a surgery is the creation of a resection line within the healthy tissues. Results of the RPs, from the earlier literature, can be considered as very good [2–6]. In a series of 17 cases operated on by California surgeons, there were only 2 complications (pulmonary embolism and wound infection), without suture leak, intra-abdominal abscess, or postoperative intestinal obstruction [3]. In a recent Turkish series of 48 resected inflammatory cecal masses, 18 of whom were

due to appendiceal phlegmon, no fatal outcomes were registered and only 1 case was complicated by wound infection [6]. The second variant of a surgical situation that requires extended surgery is a suspected cecal or appendiceal malignancy. In some such cases of supposed destructive appendicitis, the vermiform appendix is normal, and paracolic mass and/or abscess is present. In other cases, a destructive appendicitis is combined with cecal or appendiceal cancer. Not infrequently, these diseases are pathogenetically correlated: a neoplastic obstruction of the appendiceocecal junction leads to development of acute obstructive appendicitis [9]. However, a right iliac fossa mass can complicate not only cecal cancer, but many other conditions as well (ileal or cecal diverticulitis, Crohn's disease, non-specific typhlitis, intestinal tuberculosis, sarcoidosis, endometriosis, and some fungal and parasitic diseases) [1,6,7].

We believe that the treatment approaches in these 2 subgroups are usually different. If it is impossible to exclude a tumor with perifocal inflammation or even abscess, it is much easier for a surgeon, both psychologically and legally, to make a decision on RP. When diagnosis of severe appendicitis is obvious, it is much more difficult to choose an RP, even in severe inflammatory/necrotic changes. How to explain a resection in this situation? A surgeon reduces the risk of **potential** complications (e.g., bowel fistula, peritonitis, and ileus) by increasing the extent of surgery. Moreover, in these circumstances the above complications do not always occur. We suspect that the surgical community is not ready to perceive the appropriateness, both medical and economic, of RPs for advanced appendicitis, but we hope that these procedures will be used in rare situations where, on the one hand, percutaneous abscess drainage is impossible and, on the other hand, simple appendectomy is not safe enough due to wide extension of the necrotic process.

Among the cases published, our case can be considered as unique because isolated ileal resection combined with appendectomy for destructive appendicitis has not been presented previously. However, our tactical decision was logical. Although a decision on resection of the involved ileum was psychologically difficult, it was corresponded to the surgical situation. Anastomosis was done in a wide-lumen area with suturing of a healthy bowel by a high-quality atraumatic material. We believe that an ileal resection in this case was much safer than a non-resectional procedure. The good short- and mid-term results confirm the advantages of our surgical tactics.

Despite the fact that the percutaneous catheter drainage under ultrasound or computed tomography guidance has recently become the preferred initial treatment of the appendiceal abscess [10,11], open surgery is justified in some individual cases [11,12]. In our case, the unavailability of percutaneous procedure was the main indication for open surgery. In

addition, the percutaneous abscess drainage may not be completely successful due to presence of large fecaliths, which is a risk factor for abscess recurrence [13].

Conclusions

Finally, during the procedure, we were not limited to a simple drainage of the abscess in favor of the appendectomy

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plus bowel resection due to a high risk of the fecal fistula explained by the large size of the fecaliths and, therefore, the wide lumen of the remaining (non-necrotized) part of the vermiform appendix.

Conflict of interest

None.