

Flank Abscess After Perforated Acute Appendicitis

Perfore Akut Apendisit Sonrası Gelişen Flank Absesi

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ABSTRACT

Aim: Abscess after appendectomy is an important problem. However, there was no case of flank abscess after appendectomy in literature. In this case report, we wanted to present a case of flank abscess due to perforated appendicitis.

Case: A 65-year-old male patient presented to the emergency department with complaints of abdominal pain and fever. The patient was diagnosed with acute appendicitis during the evaluation in the emergency department, and emergency surgery was planned for the patient. During laparoscopic exploration, perforation was observed in the middle part of the appendix. The patient underwent laparoscopic appendectomy. Abdominal ultrasonography (USG) was performed on the patient since there was no regression in the patient's infective parameter values in the postoperative service follow-up. No pathology (abscess or fluid collection) was observed in the USG evaluation. Computed tomography (CT) was performed as the patient's infective blood parameters continued to increase. CT scan showed a 70*50 mm abscess in the right flank without intra-abdominal abscess. Abscess drainage was performed with a right flank incision under sedation. All laboratory parameters returned to normal on the 14th postoperative day, and the patient was discharged without complications.

Conclusion: Flank abscess after appendectomy is a very rare condition. The diagnosis of flank abscess should be kept in mind in patients who underwent appendectomy due to perforated appendicitis and whose infective blood parameters continue to be elevated in the follow-up.

Keywords: Abscess, appendectomy, drainage, laparoscopy

ÖZ

Amaç: Apendektomi sonrası apse önemli bir problemdir. Ancak literatürde apendektomi sonrası flank apse vakasına rastlanılmamıştır. Bu olgu sunumunda perfore apandisit nedeniyle gelişen bir flank apse olgusunu sunmak istedik.

Olgu: 65 yaşında erkek hasta karın ağrısı ve ateş şikâyeti ile acil servise başvurdu. Acil serviste yapılan değerlendirmede hastaya akut apandisit tanısı konuldu ve acil cerrahi planlandı. Laparoskopik eksplorasyon sırasında apendeksin orta kısmında perforasyon izlendi. Hastaya laparoskopik apendektomi uygulandı. Postoperatif servis takibinde hastanın enfektif parametre değerlerinde gerileme olmadığı için hastaya karın ultrasonografisi (USG) yapıldı. USG değerlendirmesinde herhangi bir patoloji (apse veya sıvı toplanması) gözlenmedi. Hastanın enfektif kan parametrelerinin artmaya devam etmesi üzerine, bilgisayarlı tomografi (BT) çekildi. BT'de karın içi apsesi olmaksızın sağ flankta 70*50 mm apse görüldü. Sedasyon altında sağ flank insizyonu ile apse drenajı yapıldı. Ameliyat sonrası 14. günde tüm laboratuvar parametreleri normale dönen hasta komplikasyonsuz taburcu edildi.

Sonuç: Apendektomi sonrası flank apsisi çok nadir görülen bir durumdur. Perfore apandisit nedeniyle apendektomi yapılan ve takipte enfektif kan parametreleri yükselmeye devam eden hastalarda flank apse tanısı akılda tutulmalıdır.

Anahtar Kelimeler: Abse, apendektomi, drenaj, laparoskop

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Introduction

Acute appendicitis (AA) is the most common cause of acute abdomen in patients of all age groups presenting to the emergency department (1). The symptoms and physical findings of the patients are mostly diagnostic. Laboratory findings such as white blood cell (WBC) count, leukocyte count, C-reactive protein (CRP) level and imaging tools such as ultrasonography (USG), computed tomography (CT) and magnetic resonance imaging (MRI) are helpful in confirming the diagnosis of AA. If the diagnosis cannot be made despite these additional examinations and the diagnosis of AA is still suspected, diagnostic operations can be applied as last remedy (2).

As with any disease, early diagnosis of AA is important. Because, depending on the delay in diagnosis, the probability of appendiceal perforation increases. In the literature, there is a morbidity rate of up to 10% and a mortality rate of up to 5% for AA. Studies have shown that early appendectomy reduces the risk of perforation and surgical site infections (3, 4). In addition, the delay in the application of appendectomy affects both the possibility of intra-abdominal abscess and postoperative complications (5). However, there are studies in the literature showing that delayed appendectomy does not affect morbidity (6, 7).

Complicated appendicitis is defined as perforated appendicitis, peri appendicular abscess, or peritonitis. These diagnoses are tried to be determined with imaging tools such as USG and CT (8). In some cases, the diagnosis cannot be made immediately, and repeated examinations and tests are required.

In this case report, we wanted to present a case of flank abscess that developed after perforated appendectomy and its treatment.

Case Report

A 65-year-old male patient presented to the emergency department of Erzurum Regional Education and Research Hospital in October 2019 with complaints of abdominal pain, nausea and vomiting for two days. The patient had no history of surgery and only had hypertension. On evaluation, vital findings of the patient were as follows: blood pressure: 124/75 mm Hg, pulse rate: 118 beats per minute, oxygen saturation on room air: 95% and body temperature: 38.3° Celsius. On physical examination of the abdomen, there was tenderness and rebound in the right upper and lower quadrants.

There was no laboratory pathology except for C-reactive protein (CRP) elevation (31 mg/L) and leukocyte count elevation ($25.1 \times 10^3/\text{mm}^3$). Computed tomography showed an appendix with a diameter of 12 mm (Figure 1) and paracolic inflammation with suspicious abscess (Figure 2 and 3). Laparoscopic surgery was planned for the patient. Purulent fluid was present in both the Douglas's pouch and



Figure 1: CT scan showed enlarged 12mm diameter appendix tissue with an intact radix.



Figure 2. On CT scan, there was enlarged appendix tissue with peri-appendicular inflammation.

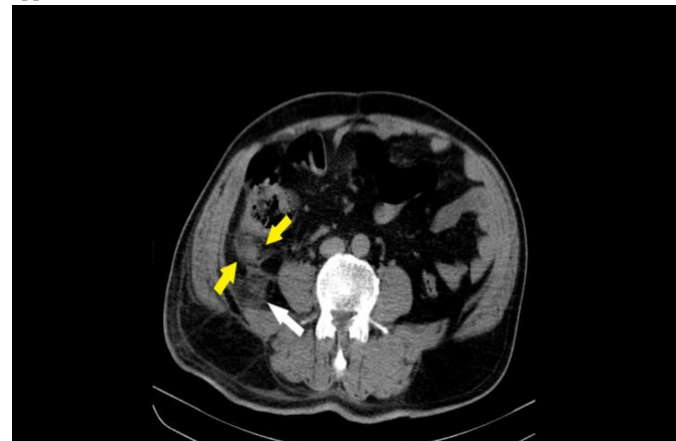


Figure 3. Two yellow arrows show distal part of the appendix, while white arrow shows inflamed retro-Toldt's fascia.

the right lower abdomen during exploration. In addition, perforation was observed in the middle part of the appendix. The appendix and all necrotic tissues surrounding the appendix were removed from the abdomen with a glove bag. One drain was placed in the paracolic region and the other in the pelvic cavity.

The patient was followed up in the service in the postoperative period. Intravenous ertapenem 1 gram (one vial per day) started. Oral intake was started at the postoperative 6th hour. On the fifth postoperative day, CRP value (25 mg/L) and leukocyte count ($19.1 \times 10^3/\text{mm}^3$) were

still high, but there was no fluid coming from the drains. Therefore, abdominal USG was performed on the patient and no pathology (abscess or fluid collection) was observed. All drains were removed on the sixth postoperative day. CRP level (27.2 mg/L) and leukocyte count ($18 \times 10^3/\text{mm}^3$) were still high on the seventh postoperative day. Therefore, contrast-enhanced abdominal CT was planned for the patient. CT scan revealed a 70*50 mm abscess on the right flank without intra-abdominal abscess (Figure 4 and 5). The flank abscess drainage was performed under sedation. Abscess material was studied for culture and antibiogram. Since *Enterococcus faecalis* grew in the antibiogram and was sensitive to ertapenem, the current antibiotherapy was continued. Daily wound cleaning was performed with rifamycin 125 milligram/1.5 millimeter vial (every 12 hours) and 3% hydrogen peroxide. Intravenous ertapenem treatment was completed to 14 days. The patient was discharged when all laboratory parameters were normal [CRP level (1.2 mg/L) and leukocyte count ($7.6 \times 10^3 / \text{mm}^3$)] on the postoperative day 14. The flank incision left to secondary healing. The wound was closed on the 15th day after discharge. No pathology was detected in the control of the patient in the first month after discharge. Written informed consent was obtained from the patient for publication of this case.



Figure 4. There was no inflammatory area in the abdominal cavity postoperatively.

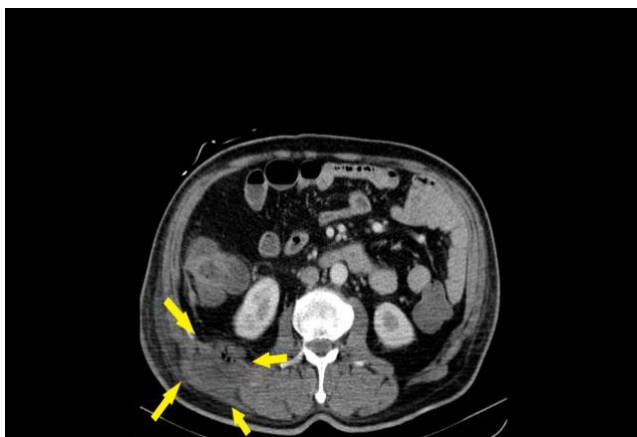


Figure 5. CT scan shows a right flank abscess of 70 * 50 mm in size.

Discussion

Acute appendicitis (AA) is the most common cause of acute abdomen (9). The clinical picture of AA starts with visceral peritoneal sensitivity and with increasing inflammation, parietal peritoneal sensitivity is added to the clinical picture. Although there is no definite localization of the pain at the beginning, the pain usually progresses to the right lower quadrant with increasing parietal peritoneal inflammation. Most patients present to emergency services with a typical history and physical examination. While laboratory tests and imaging tools help to diagnose in most patients, acute appendicitis cannot be diagnosed in a small number of patients despite all the tests. If the diagnosis cannot be made despite these additional tests and the diagnosis of AA is still suspected, diagnostic procedures should be performed as last remedy (2).

In case of delay in the diagnosis of AA or in the operation to be performed, both morbidity and mortality increase. Abdominal abscess rate increases in delayed cases. Abscess formations can be seen in the retroperitoneal region and between muscle fibers outside the abdomen (10). Retroperitoneal abscess formation can be a serious complication of AA, which confronts physicians with difficult diagnosis and early treatment due to its insidious onset and various problems. Retroperitoneal abscess formation can occur anywhere in the retroperitoneum, including the psoas muscle with possible extension to the thigh (11). Infection can pass through Toldt's fascia and abscess can be seen between the abdominal lateral muscles, as in our study. In this case report, a rare case of abscess developing after appendectomy is presented.

Post-appendectomy intra-abdominal abscesses are estimated to complicate up to 4.2% of acute non-perforated appendicitis cases and 6.7% to 28% of acute perforated appendicitis cases (12). Laparoscopic appendectomy has been shown to be safe and effective for acute appendicitis, but a higher rate of intra-abdominal abscess has been reported in laparoscopic appendectomy compared to open appendectomy (13). In studies, predisposing factors in adults for post-appendectomy intra-abdominal abscess were as follows: perforated appendicitis, CRP greater than 200 mg/L, leukocyte greater than $17 \times 10^3/\text{mm}^3$ (14). In the presence of intra-abdominal abscess, length of hospital stay, rate of readmission and re-intervention increase. Most cases of abdominal abscess are treated medically with antibiotics. However, in some cases, an abdominal abscess needs to be drained with a catheter or re-operated. Our patient had leukocytosis (over $17 \times 10^3/\text{mm}^3$) and perforated appendicitis, which are high risk factors. However, intra-abdominal abscess did not develop in the patient during the follow-up.

Percutaneous drainage catheter is also an option in the treatment of patients who develop flank abscess after

appendectomy. However, due to the lack of technical facilities of the hospital, abscess drainage was applied to the patient.

Conclusion

In conclusion, flank abscess after appendectomy is a very rare condition. The diagnosis of flank abscess should be kept in mind in patients who underwent appendectomy due to perforated appendicitis and whose infective blood parameters continue to be elevated in the follow-up. In appropriate cases, interventional drainage should be tried as first-line treatment. However, as in our case, re-surgery has a place in the treatment of flank abscess due to technical impossibilities. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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Authors Contribution: TK contributed to designing the study and preparation of the manuscript.

Informed Consent Statement: Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review in this journal.

References

1. Yeni M, Peksöz R, Dablan A, et al. A rare acute abdomen case: Acute appendicitis in the patient with situs inversus totalis. *J Surg Med.* 2019;3(10):766-8.
2. Ahmed HO, Muhedin R, Boujan A, et al. A five-year longitudinal observational study in morbidity and mortality of negative appendectomy in Sulaimani teaching Hospital/Kurdistan Region/Iraq. *Scientific reports.* 2020;10(1):1-7.
3. Ditillo MF, Dziura JD, Rabinovici R. Is it safe to delay appendectomy in adults with acute appendicitis? *Annals of surgery.* 2006;244(5):656.
4. Busch M, Gutzwiller FS, Aellig S, et al. In-hospital delay increases the risk of perforation in adults with appendicitis. *World journal of surgery.* 2011;35(7):1626-33.
5. Papandria D, Goldstein SD, Rhee D, et al. Risk of perforation increases with delay in recognition and surgery for acute appendicitis. *Journal of Surgical research.* 2013;184(2):723-9.
6. Almström M, Svensson JF, Patkova B, et al. In-hospital surgical delay does not increase the risk for perforated appendicitis in children. *Annals of surgery.* 2017;265(3):616-21.
7. Yardeni D, Hirschl RB, Drongowski RA, et al. Delayed versus immediate surgery in acute appendicitis: do we need to operate during the night? *Journal of pediatric surgery.* 2004;39(3):464-9.
8. Mariage M, Sabbagh C, Grelpois G, et al. Surgeon's Definition of Complicated Appendicitis: A Prospective Video Survey Study. *Euroasian journal of hepato-gastroenterology.* 2019;9(1):1.
9. Kotan Ç, Köseoğlu B, Barut İ, et al. The Comparison of Clinical Features of Acute Appendicitis in Childs, Adults and Elderly Population. *Van Medical Journal.* 7(4):133-7.

10. Moslemi S, Tahamtan M, Hosseini SV. A late-onset psoas abscess formation associated with previous appendectomy: a case report. *Bulletin of Emergency & Trauma.* 2014;2(1):55.

11. Hsieh C-H, Wang Y-C, Yang H-R, et al. Retroperitoneal abscess resulting from perforated acute appendicitis: analysis of its management and outcome. *Surgery today.* 2007;37(9):762-7.

12. Coelho A, Sousa C, Marinho A, et al. Post-appendectomy intra-abdominal abscesses: six years' experience in a Pediatric Surgery Department. *Cirurgia pediátrica: organo oficial de la Sociedad Espanola de Cirugia Pediatrica.* 2017;30(3):152-5.

13. Sauerland S, Jaschinski T, Neugebauer EA. Laparoscopic versus open surgery for suspected appendicitis. *Cochrane Database of Systematic Reviews.* 2010(10).

14. Levin DE, Pegoli W. Abscess after appendectomy: Predisposing factors. *Advances in surgery.* 2015;49(1):263-80.