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Case Series

Unusual complications of a common disease in COVID times: a case series

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ABSTRACT

Acute appendicitis is the most common abdominal surgical emergency worldwide. 20-30% of cases of appendicitis can complicate which is defined as perforation, purulent peritoneal collection, abscess formation and generalized peritonitis. The risk of perforated appendicitis increases when appropriate treatment for acute appendicitis is delayed. There has been an avoidance of both urgent or emergency and routine medical care because of Coronavirus disease 2019 (COVID-19) concerns all over the world. In our study, the delayed presentation of the patients with acute appendicitis to the hospital prevented appropriate management leading to a much more morbid disease course. Increasing accessibility of medical and telehealth services might help prevent delay of needed care. Even during the COVID-19 pandemic, persons experiencing a medical emergency should seek and be provided care without delay.

Keywords: Appendicitis, COVID, Perforation, Complicated appendicitis, Obstruction, Abscess

INTRODUCTION

Acute appendicitis is the most common abdominal surgical emergency worldwide.[1] Appendicitis has a spectrum of clinical presentation. The most common being uncomplicated appendicitis. The disease can become complicated if there is perforation appendicitis, periappendicular abscess or peritonitis.[2] These complications can be attributed to delay of presentation, female gender, immunosuppression, diabetic status, delay in the diagnosis, delay in the decision for surgery, and to the age acquired physiological changes in extremes of age.[3] The time factor is the most recogonised factor of causing perforation in appendicitis. Late presentation of the patients is major cause of perforation because the probability of complications increases with the increase in duration between symptom onset and treatment.[4] The timeline of symptoms is variable but the disease usually progresses from early appendicitis at 12-24 hours to perforation at greater than 2 days. 75% of patients present within 24 hours of the onset of symptoms. The perforation risk is variable but in a study it has been reported to be of 2% at 36 hours and around 5% every 12 hours after that. If the abscess following the perforation has been contained, then the presentation can be more indolent.[5] Ishiyama et al reported an association between large appendicoliths at the base of the appendix with appendiceal perforation and gangrene.[6] Imran et al. described increased rates of perforated appendicitis in patients with appendicoliths and longer symptom duration.[7]

The signs and symptoms in appendicitis can be variable – around 20-30% patients present with atypical symptoms, signs, or laboratory findings.[8] The rate of perforation varies from 16% to 40%, with a higher frequency in younger age groups (40–57%) and in patients older than 50 years (55–70%).[9]

The death rate from uncomplicated appendicitis is almost negligible, while the death rate for perforated appendicitis may range from 5% to as high as 50% in some studies.[10] Despite this high mortality rate, few patients can still survive and often land up with rare life threatening complications which are only seen in extremely late presentations of the disease. These might be patients with no other risk factors, good functional and immune status with failed conservative management. We were able to witness such extremely late and rare presentations of complicated appendicitis in COVID 19 times.

Incidentally, we came across some unusual complications in three patients with acute appendicitis in the COVID 19 times.

CASE SERIES

Case 1

A 26 years old male with no known comorbidities presented to ER with history suggestive of episode of acute appendicitis 8 days back managed with over the counter medications. He now complained of pain in the right lower abdomen and high grade fever for 3 days and patches of skin discoloration on the right lower abdomen for 2 days. On examination his heart rate was 108 bpm BP was 90/ 60 mm Hg. Two brown colored patches were seen: a 5×3 cm patch- 4 cm. above and medial to ASIS and a 6×5 cm patch- 3 cm. below ASIS. The patches were surrounded by erythrema, there was fullness over right lower abdomen with edema over right lumbar, iliac, perineal extending to right perianal region. The overlying skin of patches was cold compared to rest of the abdomen. A provisional diagonosis of appendicular abscess with necrotizing soft tissue infection was made. His leucocyte counts were 19,000/mm3. Abdominal X Ray showed dilated ascending and transverse colon. USG abdomen was suggestive of subcutaneous edema over right iliac fossa with mild free fluid with echoes in the right iliac fossa and paracolic gutter with surrounding echogenic mesentery. Appendix not visualised. The features were suggestive of appendicular perforation. The patient was managed by extensive debridement of necrosed subcutaneous tissue over right iliac, umblical, hypogastrium, right gluteal region and underlying gangrenous muscles extending upto rectus abdominis of left side. Toxic fluid and pus were drained from the peritoneal cavity and lavage was given. 1×1 cm. perforation was observed over appendicular tip- for which appendectomy was done. The wound was managed with wet and dry dressings and was the wound coverage was done with tensor facia lata flap on post operative day 55. The patient was discharged on POD 62 and is being followed up in the OPD.

Type 1 Necrotising fascitis due to appendicular perforation is a rare scenario. Only 18 cases have been reported in the English literature with 7 cases affecting abdominal wall, 5 cases affecting abdominal wall and flank, 3 cases involving thigh and 3 cases involving the scrotum.[11]

The proposed mechanism for these scenarios is that the Inferior lumbar triangle and the superior lumbar triangle are void of muscular layers and are areas of relative weakness in the abdominal wall. They have potential of propagation of infection. Therefore, perforated reterocaecal acute appendicitis can cause reteroperitoneal abscess/infection which can pass through these two triangles to the flank and lumbar area.[12]

Figure 1: Brown colored patches over right lower abdomen.

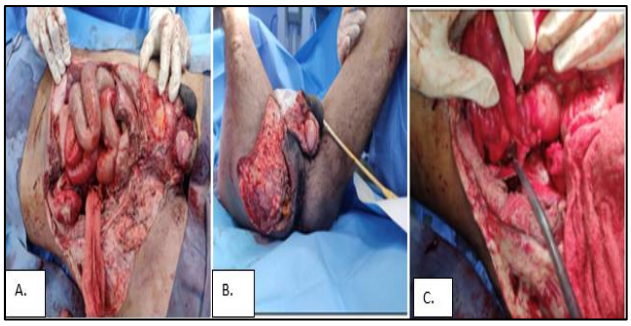

Figure 2: (A) Debrided abdominal wall wound. (B) Debrided perineal wound. (C) 1×1 cm appendicular tip perforation.

Another proposed mechanism is that the ruptured appendix can be complicated by localized peritonitis and the formed abscess can disseminate through the rectus abdominis muscle. The anatomy of the inferior epigastric vessels is identified as a weak point between the intra-abdominal space and the abdominal wall. Thus, influencing the inferior epigastric vessels can cause extravasation of pus. For the cases involving the right thigh, they are likely from more direct infective spread along right femoral neurovascular bundles.[13]

Case 2

A 22 years old male with no known comorbidities with history suggestive of episode of acute appendicitis 9 days back which was managed by a local practitioner, he now presented with complaints of right sided abdominal pain and shortness of breath for 4 days. On examination, pulse

rate was 104 bpm, BP was 108/ 82 mm Hg, respiratory rate was 28 bpm with abdomino-thoracic respiration and SpO2 was 96% on room air. On per abdomen examination fullness was noted over right hypochondrium, tenderness and guarding were seen over right hypochondrium and right iliac regions. On examination of the chest, decreased breath sounds were heard over base of right side. His total leucocyte count was 24,000/mm3, chest radiograph showed CP angle blunting on right side and raised right hemidiaphragm. USG abdomen was suggestive of heteroechoic collections in right subdiaphragmatic region and right iliac fossa, with echogenic mesentery. Appendix not visualised separately and pleural effusion on right side with separation of 3 cm was noted.

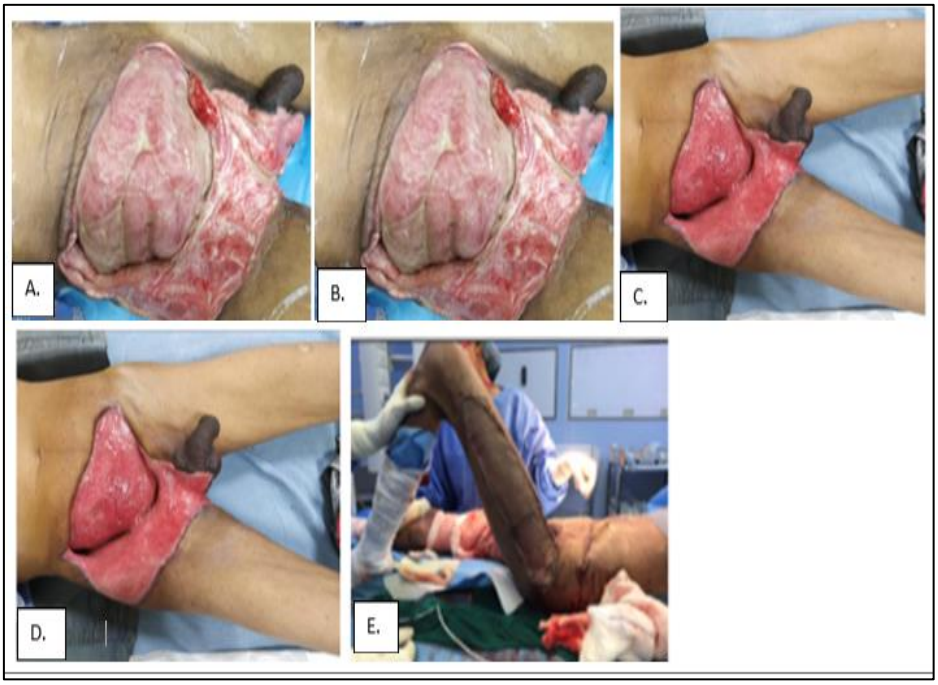

Figure 3: (A) Wound on post operative day 30. (B) Wound on post operative day 40. (C) Wound on post operative day 45. (D) Tensor fascia lata flap to cover the wound. (E) Split skin graft to cover the thigh donor site.

On performing CECT Abdomen- pericolic fat stranding involving caecum, ascending and transverse colon and ill-defined collection with air foci surrounding base of the appendix (5.2×2.3×13.8) were seen, with another large collection (11.5×8.2×8.2 cm) in right hypochondrium in subdiaphragmatic space. The features were suggestive of appendicular perforation with large intraperitoneal collections. The patient was managed by Pigtail catheterisation of right iliac fossa and subdiaphragmatic collection. The catheters drained purulent output of approximately 250 and 800 ml respectively. ICD was placed in the right pleural cavity which drained 400 ml of serous fluid. Antibiotics were started according to pus culture. Patient was advised Chest physiotherapy and spirometry. He was discharged on postadmission day 10, is being followed in OPD and doing well.

Subphrenic abscesses are usually associated with perforated gastric or duodenal ulcers and surgery. Subphrenic abscess secondary to appendicular perforation are unusual. Most of the reported cases are due to appendicitis associated with intestinal malrotation. Other causes are ectopic appendix (subhepatic retrocecal appendicitis), dropped appendicoliths during laparoscopic appendectomies.[14]

Barnard in 1908 gave theories on mechanisms of spread of infection to subphrenic spaces. These were: as part of a diffuse peritonitis, slow and direct extension up the peritoneal fossae from the pelvis, through the medium of the portal vein causing pyelophlebitis, by lymphatic extension, either up the right retroperitoneal cellular tissues, or up the lymphatics accompanying the deep epigastric artery to the falciform ligament. Out of these the second method is the most common.[15]

Case 3

A 30 years old male presented with pain right lower abdomen for 10 days which progressed to generalised pain abdomen for 5 days. The pain was associated with abdominal distension, bilious vomiting and inability to pass stools and flatus for 3 days. On examination, his HR was 110 BPM and he was hypotensive. On per abdomen examination, his abdomen was distended with generalised tenderness, guarding and raised bowel sounds. His total leucocyte count was 16,000/cumm. The abdominal X Ray showed dilated bowel loops and ultrasound of the abdomen showed moderate septated ascites with coarse internal echoes. A CECT of the abdomen was done which showed featutes suggestive of small bowel obstruction with with 3×3 cm collection behind ileocecal junction

showing air foci. The findings were suggestive of a possibility of sealed off hollow viscus perforation. Patient was taken to the operating room for an exploratory laparotomy and the findings revealed 500 ml of sero-purulent contamination in abdominal cavity with pus flakes. The small bowel loops were edematous, ileal loops were clumped in the right iliac fossa adhered to caecum. There was 40 cc of foul smelling thick pus in right iliac fossa. Appendix was reterocaecal in position and was sloughed out. Caecal base and 1 cm of appendicular stump was healthy. Peritoneal lavage with urobag laparostomy was done. Further Dressings were done with vaccum assisted closure. Patient was discharged on post operative day 14 after delayed abdominal closure.

First case of intestinal obstruction due to acute appendicitis-described by Hotchkiss.[16] Few additional cases have been reported since then. Among the articles found, the mechanism of obstruction were mechanical, secondary to paralytic ileus, strangulation, or mesenteric ischemia. In majority (84.4%) of cases it was due to mechanical obstruction.[17] Mechanical obstruction could result from one or a combination of the following: appendix laid across loops of bowel bound down by adhesions, or herniation through a ring or gap formed by the appendix tip being attached to its base, or by appendix tip attached to the bowel causing a torsion, or by kinking of the bowel or by complex knotting.[18-21]

DISCUSSION

Fitz et al. in 1886 described the relationship between the appendix and pelvic abscess. The abscess caused an increase in morbidity making appendectomy the preferred treatment for acute appendicitis.[22,23] In the times when there were no antibiotics, appendectomy could prevent pelvic sepsis and was life saving. Bailey et al described the conservative management of appendicitis in 1930, which included rest and fasting followed by delayed elective appendectomy.[24] Although appendectomy was the mainstay of treatment, antibiotics were available. Coldrey in 1956 used antibiotic therapy to treat 471 patients of acute appendicitis. The results were mortality in 0.2% patients and only 14.4% patients had recurrence.[25]

Although for about a century, appendectomy is the standard procedure of choice for uncomplicated acute appendicitis, conservative management of acute appendicitis is gaining more acceptance in the present-day scenario.

The choice of the treating surgeon to manage a case of acute appendicitis conservatively can be– desirable or undesirable (as a forced decision).

Non-operative treatment of an uncomplicated acute appendicitis can have many advantages including high success and low recurrence rates, reduced morbidity and mortality, less pain, shorter hospitalization and sick leave, and reduced costs. . But delaying surgery may increase the risk of perforated appendicitis, intra-abdominal abscesses, and localized or diffuse peritonitis.[26] Therefore, a very close monitoring of the patient's condition should be done and the option of performing rescue appendectomy should always be considered.[27]

It can also be taken as a forced decision in various conditions when access to a surgical aid is not possible or delayed like for a patient with acute appendicitis on board ship where a transfer of the patient can take longer than 12–24 h, patients in third world or developing countries where the access to surgical healthcare is poor, in case of a natural disaster where healthcare facilities have been disrupted or as in our case, a pandemic like COVID 19 which caused significant healthcare delays.

CONCLUSION

There has been an avoidance of both urgent or emergency and routine medical care because of COVID-19 concerns all over the world. Despite implementation of safety precautions to reduce the risk of SARS-CoV-2 infection among patients and personnel, there has been delay or avoidance of care might increase risk for life-threatening medical emergencies. In such circumstances, the access to medical services might be challenging because of disruptions in essential support services, which can result in adverse health outcomes. A decrease in availability of accessible transportation, access to communication, perceptions of exposure risk to SARS-CoV-2, and logistic difficulties of telecommunication cause a difficulty in access to healthcare for the disabled. 28 The fear of COVID 19 and subsequent lockdowns lead to delay of presentation of these patients and a lack of adequate monitoring and referral causing a catastrophic disease course for these patients. Increasing accessibility of medical and telehealth services might help prevent delay of needed care. Also, tertiarally complicated cases like these need the multidisciplinary healthcare and infrastructure facility of a tertiary healthcare centre. Thus, even during the COVID-19 pandemic, persons experiencing a medical emergency should seek and be provided care without delay.

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REFERENCES

1. Ahmed SA, Makama JG, Mohammed U, Sanda RB, Shehu SM, Ameh EA. Epidemiology of appendicitis in Northern Nigeria: A 10-year review. Sub Saharan Afr J Med. 2014;1:185-90.
2. Klempa I. Current therapy of complicated appendicitis. Chirurg. 2002;73(8):799-804.
3. Omari AH, Khammash MR, Qasaimeh GR, Shammari AK, Yaseen MK, Hammori SK. Acute appendicitis in the elderly: Risk factors for perforation. World J Emerg Surg. 2014;9:6.

4. Ng CP, Chiu HS, Chung CH. Significance of appendicoliths in abdominal pain. J Emerg Med 2003;24:459-61.
5. Jones MW, Lopez RA, Deppen JG. Appendicitis. In: StatPearls. StatPearls Publishing, Treasure Island (FL). 2020.
6. Ishiyama M, Yanase F, Taketa T, Makidono A, Suzuki K, Omata F et al. Significance of size and location of appendicoliths as exacerbating factor of acute appendicitis. Emerg Radiol. 2013;20(2):125-30.
7. Imran JB, Madni TD, Minshall CT, Mokdad AA, Subramanian M, Clark AT et al. Predictors of a histopathologic diagnosis of complicated appendicitis. J Surg Res. 2017;214:197-202.
8. Von Titte SN, McCabe CJ, Ottinger LW. Delayed appendectomy for appendicitis: causes and consequences. Am J Emerg Med. 1996;14(7):620-2.
9. Livingston EH, Woodward WA, Sarosi GA. Disconnect between incidence of nonperforated and perforated appendicitis: implications for pathophysiology and management. Ann Surg. 2007;245:886-92.
10. Arnold S. Jackson, Rollin Perkins. Reducing the mortality of perforated appendicitis: A study of one hundred cases. The American Journal of Surgery.1940;49(2):250-8.
11. Hua J, Yao L, He ZG, Xu B, Song ZS. Necrotizing fasciitis caused by perforated appendicitis: a case report. Int J Clin Exp Pathol. 2015;8(3):3334-8.
12. Ishigami K, Khanna G, Samuel I, Dahmoush L, Sato Y. Gas-forming abdominal wall abscess: unusual manifestation of perforated retroperitoneal appendicitis extending through the superior lumbar triangle. Emerg Radiol. 2004;10:207-9.
13. Taif S, Alrawi A. Missed acute appendicitis presenting as necrotising fasciitis of the thigh. BMJ Case Rep. 2014;2014:bcr2014204247.
14. Di Marco JN, Poujol A, Rimet Y, Jarry JM, Bryselbout MA, Brusquet Y. Subphrenic abscess due to ectopic appendicitis. Arch Pediatr. 1999;6(9):975-8.
15. Barnard HL. Three Lectures on Acute Appendicitis. Brit Med Jour. 1908;281-333.
16. Hotchkiss LWV. Acute Intestinal Obstruction following Appendicitis. A Report of Three Cases Successfully Operated upon. Ann Surg. 1901;34:660-77.
17. Makama JG, Kache SA, Ajah LJ, Ameh EA. Intestinal Obstruction Caused by Appendicitis: A Systematic Review. J West Afr Coll Surg. 2017;7(3):94-115.
18. Ahmed KA, Hamdy AM, Seifeldin MI, Elkeleny MR. Mechanical small bowel obstruction due to appendiceal tourniquet: a case report and review of literature. J Med Case Reports. 2019;13(1):208.
19. Maly O, Paral J. Appendicitis as a rare cause of mechanical small-bowel obstruction: A literature review of case reports. Int J Surg Case Rep. 2016;29:180-4.
20. Lawani I, Houndje CY, Souaïbou YI, Gbéssi DG, Attolou SG, Gnangnon FH, et al. Internal hernia strangulated on appendicular tourniquet: a case report of an exceptional anomaly of the appendix revealed by a rare hernia. Surg Case Rep. 2019;5(1):112.
21. Bhandari L, Mohandas P. Appendicitis as a cause of intestinal strangulation: a case report and review. World J Emerg Surg. 2009;4:34.
22. Cho HW, Koo YJ, Min KJ, Hong JH, Lee JK. Pelvic inflammatory disease in virgin women with Tubo-ovarian abscess: a single-center experience and literature review. J Pediatr Adolesc Gynecol. 2017;30(2):203-8.
23. El Hentour K, Millet I, Pages-Bouic E, Curros-Doyon F, Molinari N, Taourel P. How to differentiate acute pelvic inflammatory disease from acute appendicitis ? A decision tree based on CT findings. Eur Radiol. 2018;28(2):673-82.
24. Bailey H. The Ochsner-Sherren (delayed) treatment of acute appendicitis: indications and technique. Br Med J. 1930;1(3603):140-3.
25. Coldrey E. Treatment of acute appendicitis. Br Med J. 1956;2(5007):1458-61.
26. Sakorafas GH, Sabanis D, Lappas C, Mastoraki A, Papanikolaou J, Siristatidis C et al. Interval routine appendectomy following conservative treatment of acute appendicitis: Is it really needed. World J Gastrointest Surg. 2012;4(4):83-6.
27. Becker P, Fichtner-Feigl S, Schilling D. Clinical Management of Appendicitis. Visc Med. 2018;34:453-8.
28. Czeisler MÉ, Marynak K, Clarke KE. Delay or Avoidance of Medical Care Because of COVID-19–Related Concerns — United States. 2020. MMWR Morb Mortal Wkly Rep. 2020;69:1250-7.

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