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Title : FUNGAL APPENDICITIS: A CASE REPORT AND REVIEW OF THE LITERATURE

Author : Dr Pragnya P. Mishra [1], Dr Smrutiranjan Hota [2], Dr Premanand Panda [3], Dr Sanghamitra Satpathi [1]

[1]Dept. of Pathology, Hitech medical college, Rourkela, India

[2]Dept. of General surgery, Hitech medical college, Rourkela, India.

[3]Dept. of Radiology, JP hospital & research centre, Rourkela, India

Corresponding Author:

Dr. Pragnya P. Mishra

Assistant professor in pathology

Hitech medical college, Rourkela, Odisha

Ph. No: 6370134349

Email: pparamita1982@gmail.com

Abstract :

Appendicitis is an emergency condition characterised by inflammation of the vermiform appendix. It is commonly caused by bacterial infections and rarely caused by fungal organisms. Fungal appendicitis is mostly seen in immunocompromised individuals. However, a few cases were reported in immunocompetent individuals. We are reporting a case of fungal appendicitis in an immunocompromised 8-year-old boy who presented to our hospital with an acute abdomen. After clinical examination and radiological imaging, the diagnosis of acute appendicitis was made, and he underwent appendectomy. The histopathology of the resected vermiform appendix showed fungal organisms of Aspergillous species with suppurative inflammation and periappendicitis. The chest radiograph and blood culture report were negative. The boy was not under any type of immunosuppressive therapy, thereby confirming the diagnosis of fungal appendicitis in an immunocompetant individual. Early diagnosis and prompt surgery with medical treatment in these cases are associated with a survival advantage.

Keywords: Appendix, Aspergillous, fungal infection, immunocompetant

Introduction :

Appendicitis is a surgical emergency condition characterised by inflammation of the vermiform appendix. Although the aetiology of appendicitis is multifactorial, in most cases, the cause remains unknown. It is believed that the most likely causes are thought to be infection and luminal obstruction. Among the infective causes of appendicitis , bacterial infection is the most common. Fungal appendicitis is a rare disease, and previous reports have only reported it in immunocompromised individuals. The definite diagnosis is based on histopathologic confirmation of a fungal organism on the appendectomy specimen . Fungal infection is a major health problem in immunocompromised populations and is often clinically mistaken as a

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bacterial infection. The diagnosis and treatment are often delayed, with fatal consequences. However, very little data is available on the prevalence and incidence of fungal appendicitis.

Case report :

An 8-year-old boy was referred to the surgery department with a 10-day history of right-sided lower abdominal pain. There were no other clinical symptoms suggesting underlying inflammatory processes like fever, changes in bowel habits, vomiting or nausea. He was born with parents who had no consanguineous marriage. He was delivered after a full-term normal pregnancy. The child's development was normal, with normal age-appropriate mile stones. The patient's medical history was not significant and he was otherwise relatively fit and well. Bowel habits were normal and there was no history of rectal bleeding or mucous discharge. There was no history of any steroids or immunosuppressive medications.

A physical examination showed vital signs were within normal limits. His abdomen was soft and there were no masses felt. He had tenderness in her right lower quadrant with voluntary guarding on palpation. There was no peritonitis and Rovsing's sign was negative. On a routine hemogram, haemoglobin was within the normal limit at 12 gm% and his total white cell count at 7.8109/L (4.0–11109/L normal range). All biochemical tests were within normal limits.

Ultrasonography of the whole abdomen was done and showed a short tubular noncompressible structure with a maximal anterior posterior diameter of 6.5cm in retrocaecal location along with mild perilesional echogenic fat (Figure 1). The CT scan of the abdomen showed a dilated, blind-ending bowel loop with perilesional fat stranding. With this, a diagnosis of subacute appendicitis was made. (Figure 2). He was admitted with a diagnosis of acute abdomen and a laparoscopic appendectomy was performed. Intraoperatively, a long appendix with adhesion was seen . The specimen was sent for histopathological examination (figure 3). The histopathology of the resected vermiform appendix showed fungal organisms with suppurative inflammation and periappendicitis (figure 4,5). **Periodic-acid-schiff**-(PAS-stain) stain shows tightly packed noninvasive laminated fungal hyphae with acute angle branching, suggesting Aspergillous infection (figure 6,7). A blood culture of the patient was done and no growth was seen. The patient was discharged and continued to receive oral itraconazole. His condition remains healthy, four months after the appendectomy.

Pictures

Fig 1: Photomicrograph : Ultrasonography of the whole abdomen showing short tubular noncompressible structure

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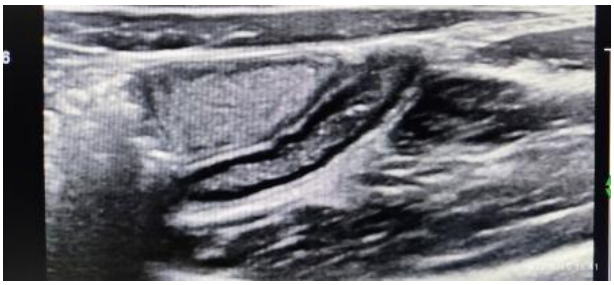

Figure 2. Photomicrograph : CT scan of the abdomen showing a dilated, blind-ending bowel loop with perilesional fat stranding

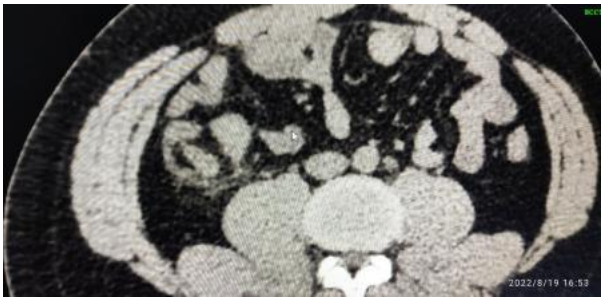

Figure 3. : Photomicrograph : Gross picture of appendix

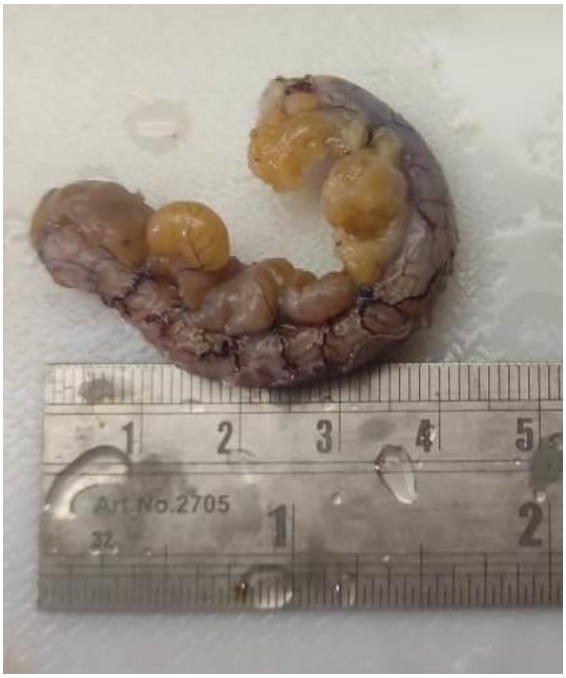

Fig 4 : Photomicrograph : H & E picture showing appendix mucosa and lumen showing fungal balls at 20x magnification

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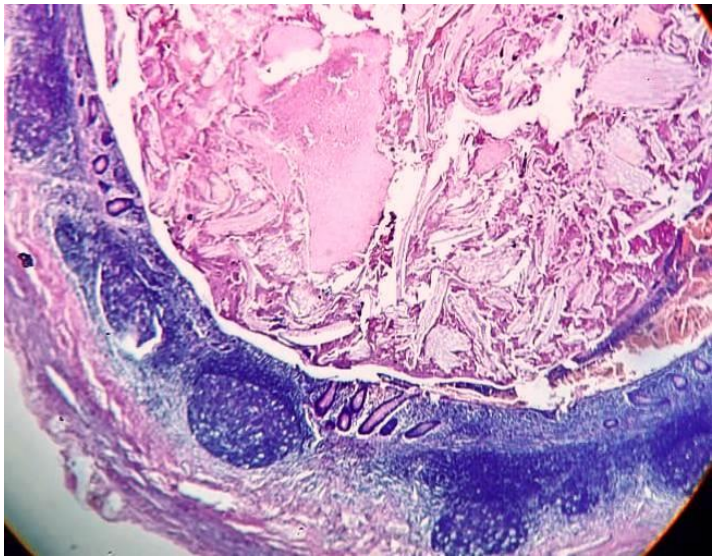

Fig 5 : Photomicrograph : H & E picture showing appendix mucosa and lumen showing fungal balls at 40x magnification

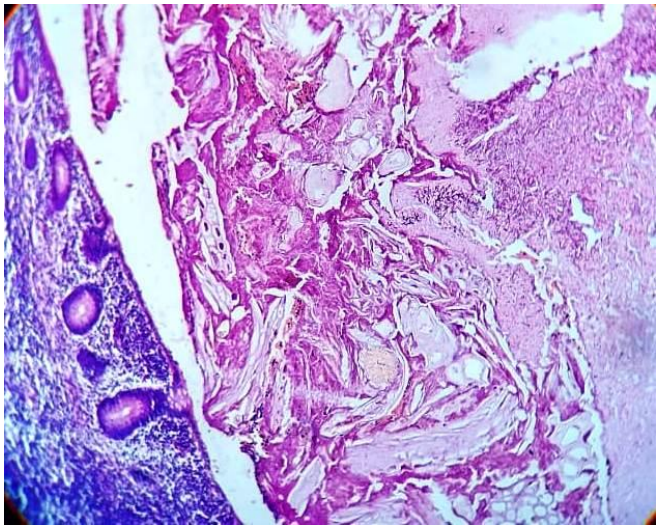

Fig 6 : Photomicrograph : PAS stain showing appendix mucosa and lumen showing fungal balls at 20x magnification

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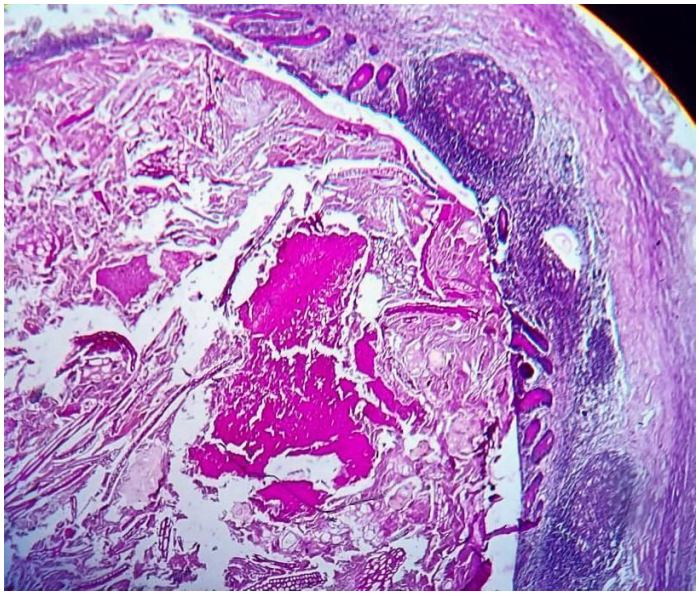
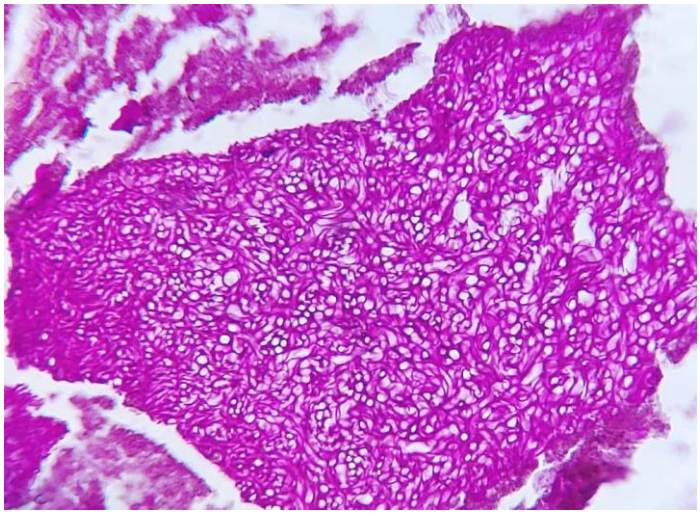


Fig 7 : Photomicrograph : PAS stain showing showing fungal balls at 40x magnification



Discussion :

Appendiceal infection is caused most frequently by bacterial infection. Fungal infection in the appendix is an uncommon disease. Fungal infection is often seen in immunosupressed individuals and organ transplant cases. Fungal appendicitis is often seen to be associated with immunosuppressed patients and has high mortality and complication rates. Different case reports are available showing mucormycosis, histoplasmosis, aspergillosis, and candidiasis as the aetiology of fungal appendicitis (Nichol et al. [2] , Christopherson et al. [3]). Fungal appendicitis is no different from acute appendicitis in terms of clinical symptoms, i.e. abdominal pain, anorexia, nausea, vomiting, and fever. The duration of these presenting symptoms is highly variable. Bacterial appendicitis and fungal appendicitis were similar in terms of symptoms, clinical signs, and laboratory investigation and radiological features . As the diagnosis of fungal appendicitis

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cannot be made by clinical and radiological manifestations alone, a high index of suspicion is therefore very essential, especially in immune-depleted cases.

The diagnosis of fungal appendicitis is made by the demonstration of fungal elements and tissue reaction. The fungal pathogen usually resides in the appendiceal mucosa or in periappendiceal vessels . Peritonitis typically occurs after extensive destruction of the vermiform appendix by fungal organisms. Fungal appendicitis usually occurs in patients with immunosuppression and organ transplantation; therefore, mucosal associated lymphoid tissue (MALT) typically shows lymphoid depletion. Reactive lymphoid hyperplasia with secondary luminal obstruction in the inflamed appendix is the less likely pathogenesis of fungal appendicitis, unlike bacterial appendicitis. However, synchronous bacterial and fungal infections may be an additional possible pathogenesis of fungal appendicitis. Aspergillus species infection of the gastrointestinal tract occurs almost exclusively in immunocompromised patients. Aspergillus appendicitis may be complicated by systemic aspergillosis. The majority of patients with aspergillus appendicitis have coexistent pulmonary lesions.

In our case, this 8-year-old boy’s appendix shows Aspergillous fungal colonies in the mucosa along with reactive lymphoid hyperplasia. The boy's blood culture showed no growth. A chest X-ray and an abdominal CT scan were performed to rule out any systemic lesion, both of which were negative. The boy was not immunosupressed. The boy was not on an immunosuppressive drug or steroid. So this is a case of fungal appendicitis due to aspergillous infection in an immunocompetant boy.

The patient was successfully treated with early appendectomy in combination with antifungal therapy. He is being followed for weeks, and he is doing well.

Conclusion :

Fungal appendicitis is rare in occurance and is seen in both immunosuppressed and immunocompetent patients who have developed classical signs and symptoms of appendicitis. A high index of suspicion, early diagnosis, and prompt surgery with proper medical treatment are associated with a survival advantage.

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