

Multi-Detector CT Findings of Primary Tubercular Appendicitis: A Case Report¹

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The frequency of intestinal tuberculosis is relatively common; however, primary tuberculosis of the appendix remains a rarity. We report on a case of primary tuberculous appendicitis for which we obtained the MDCT images revealing thickening of the appendix and the surrounding lymphadenopathies.

Index words : MDCT

Appendix
Tuberculosis
Appendicitis

The advancement of imaging modalities such as the Multi-Detector Computed Tomography (MDCT) increases the accuracy of diagnosis for cases of acute appendicitis (1, 2). The imaging findings of acute appendicitis are well documented which include a dilated nonopacified appendix, fat stranding, and an appendicolith (1). Acute appendicitis arises from an appendicolith or obstruction of the appendix. The appendix is also involved in intestinal inflammatory diseases such as Crohn's disease and intestinal tuberculosis (3, 4). However, primary tuberculosis of the appendix is extremely rare.

Although tuberculosis of the appendix can occur, its incidence is rare, occurring in only about 1.5 to 3.0% of the patients who have intestinal tuberculosis (4). The appendix may either be involved secondarily to ileocecal tuberculosis or may occur in the even rarer "isolated" form without evidence of the disease elsewhere (4). A

literature review revealed imaging findings of tubercular appendicitis (primary tubercular appendicitis or secondary tubercular appendicitis) (5, 6).

The authors experienced primary tuberculosis of the appendix with MDCT imaging findings.

However, to the best of our knowledge, the MDCT findings of a case of primary tubercular appendicitis has not been previously described. We present here the MDCT findings of primary tubercular appendicitis.

Case Report

A 48-year-old female patient was referred to our hospital complaining of abdominal pain and a chilling sensation for the last 20 days. The patient had a history of a quadrectomy of the right breast due to breast cancer 4 years prior. No evidence of tuberculosis was evident in the chest or other organs. A general examination revealed tenderness and rebound localized to McBurney's point. The routine hematologic and biochemical investigations were within normal limits, except for an elevated total leukocyte count (14,000/mL). We performed a MDCT, and the reformatted CT image revealed thickening in the appendix region with fat infiltration and surrounding lymphadenopathies (Figs. 1A - D). A

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colonoscopy revealed a well defined mass lesion with normal mucosa in the appendix orifice area (Fig. 1E). The female patient subsequently underwent a right hemicolectomy with laparoscopic assistance.

A histologic analysis of the appendectomy specimen revealed the presence of chronic caseous granulomatous inflammation, suggesting tuberculosis of the appendix (Fig. 1f). The lymph nodes also showed chronic caseous

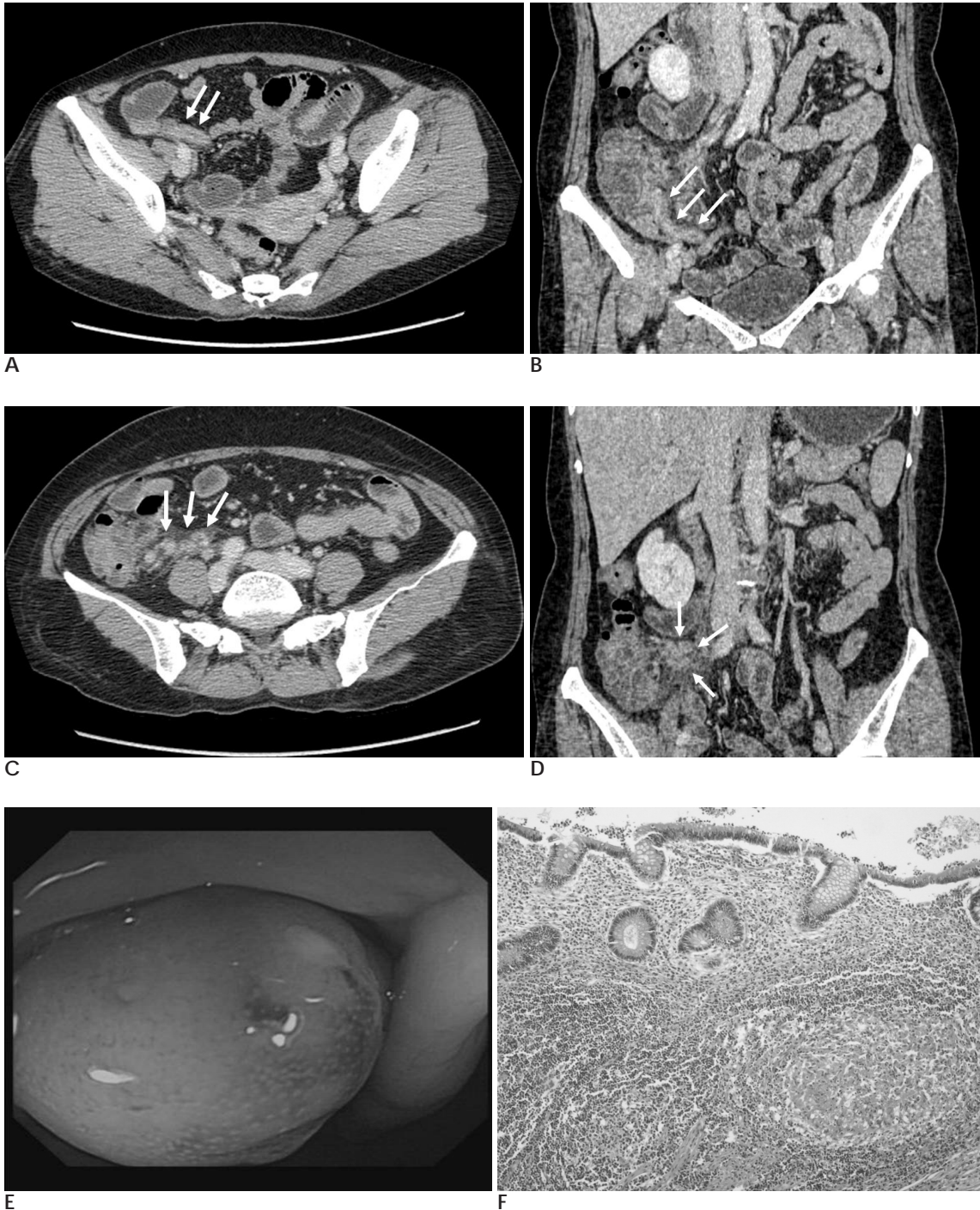


Fig. 1. A. A 48-year-old female patient. CT image shows thickening of the appendix with contrast enhancement (arrows). **B.** A coronal reformatted CT shows the entire length of the thickened appendix (arrows). **C.** The CT image shows multiple lymph nodes with mild contrast enhancement (arrows). **D.** A coronal reformatted CT shows multiple enhanced lymph nodes around the terminal ileum area (arrows). **E.** A colonoscopy shows a well defined mass lesion with preserved mucosa in the appendix orifice area. **F.** A photomicrograph shows the multiple epithelioid cell granulomas in the submucosa. (H & E \times 100).

granulomatous inflammation, which also pointed to tuberculosis on the histologic findings.

Discussion

The radiologic imaging findings such as a CT or barium study can depict acute appendicitis with evidence of appendix thickening, an appendicolith, and a periappendiceal abscess (1, 2, 7). Acute appendicitis arises from an appendicolith or from the obstruction of the appendix orifice. Other inflammatory diseases that could be involved with the appendix include Crohn's disease and tuberculosis (3, 4, 6, 7). The secondary involvement of the appendix from intestinal tuberculosis is demonstrated by a barium study in the literature (6). Primary tuberculosis of the appendix is rare and the histologic diagnosis of tuberculous appendicitis is primarily confirmed after an appendectomy (4). For this reason, the imaging findings of tuberculous appendicitis are not well documented.

The reported incidence of appendicular tuberculosis in all the appendectomies performed varies from 0.1 to 3.0% with an incidence of 1.5 to 30% among the patients who had confirmed cases of tuberculosis (8). The autopsy findings for tuberculosis patients also reveal appendicular involvement in about 30% of tuberculosis cases (4, 8). A few authors have reported that as much as 46 to 70% of intestinal tuberculosis cases involve the appendix (9).

The exact mechanisms involved in spreading tuberculosis to the appendix remains unclear (8). Further, the various ways by which the appendix can be involved are: hematogenous, by infected intestinal contents; and, by extension of the disease from neighboring ileocecal or genital tuberculosis (4, 8). A few authors consider the hematogenous route to be the common mode of spread, whereas others feel that the secondary involvement of the appendix is more common (10). Secondary involvement of the appendix can arise as either a local extension of ileocecal tuberculosis (as a retrograde lymphatic spread from distant lesions) or as appendicular serositis and periappendicitis in peritoneal tuberculosis (10). However, despite the ileocecal junction being the most common site of involvement in intestinal tuberculosis, the relative infrequency of involvement of the appendix in cases of intestinal or ileocecal tuberculosis has been explained by the minimal contact of the luminal mucosa of the appendix with the intestinal contents (9, 10). Primary tuberculosis of the appendix has no detectable

focus of infection anywhere else in the body, and is extremely rare (4, 8). The diagnosis of primary tubercular appendicitis can be made if there is an absence of any evidence of tuberculosis after a thorough examination or at laparotomy (for clinical purposes) (4, 10). The mode of infection in these cases is considered to be ingestion of contaminated foods (4).

The imaging findings of tuberculous appendicitis are not well documented. In our case, the CT showed thickening of the appendix with minimal fat infiltration and surrounding lymphadenopathies.

The findings which differentiate tuberculous appendicitis from suppurative appendicitis are not clear. We observed only surrounding lymphadenopathies in our case of primary tuberculous appendicitis; however, these findings can also be observed in suppurative appendicitis. The colonoscopy findings can mimic a submucosal tumor with a well defined mass and a normal mucosal wall. Further, no evidence of tuberculosis in the terminal ileum and colon was found upon a histologic examination. Further studies of other cases of primary tuberculous appendicitis will be necessary to properly differentiate tuberculous appendicitis from suppurative appendicitis.

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