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Transverse Colon Mesenteric Actinomycosis: A Rare Diagnosis

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Abstract

Mesenteric actinomycosis is a rare, chronic infection caused by *Actinomyces* species that may mimic other intra-abdominal pathologies, thereby creating diagnostic challenges. We report a case of abdominal actinomycosis involving the transverse colon in a patient with recurrent episodes of upper abdominal pain. Contrast-enhanced computed tomography (CECT) of the abdomen demonstrated a heterogeneous, ill-defined intraperitoneal mass measuring 86 × 71 × 53 mm anterior to the transverse colon, with surrounding fat stranding, internal air foci, a linear hyperdense component, and marked post-contrast enhancement. The radiological findings raised suspicion of gossypiboma. Colonoscopy showed narrowing of the transverse colon due to probable extrinsic compression; the mucosa was preserved without ulceration or growth.

Exploratory laparotomy identified a mass involving the thickened transverse colon and mesentery, with necrotic areas and multiple pus pockets adherent to the left lumbar abdominal wall. Approximately 10 cm of the transverse colon was resected, followed by colocolic anastomosis and creation of a defunctioning loop ileostomy. Histopathological examination revealed inflammatory cell infiltrates, multinucleated giant cells, and *Actinomyces* colonies demonstrating the Splendore-Hoeppli phenomenon, confirming abdominal actinomycosis. The postoperative course was uneventful. Following consultation, the patient received oral amoxicillin-clavulanate 625 mg three times daily for four months. The defunctioning ileostomy was reversed after six months.

This case demonstrates the nonspecific radiological features of abdominal actinomycosis and its potential to mimic gossypiboma and other intra-abdominal masses. Histopathological examination is essential for establishing the diagnosis, while appropriate surgical management and prolonged antimicrobial therapy are important for achieving favorable outcomes.

Categories: General Surgery, Infectious Disease, Gastroenterology
Keywords: abdominal actinomycosis, abdominal mass, antimicrobial therapy, chronic granulomatous infection, colonic actinomycosis, gossypiboma, histopathology, mesenteric mass, splendore–hoeppli phenomenon, transverse colon

Introduction

Actinomycosis is an uncommon, chronic granulomatous and suppurative infection caused by *Actinomyces* species, which are anaerobic or microaerophilic, filamentous, gram-positive bacteria. *Actinomyces israelii* is among the species most frequently associated with human disease [1]. These organisms normally colonize the oral cavity, gastrointestinal tract, and female genital tract but may become pathogenic following disruption of mucosal integrity. Histopathological examination may demonstrate characteristic sulphur granules, which represent aggregates of filamentous bacteria and are an important diagnostic feature of actinomycosis [2].

Cervicofacial actinomycosis is the most common clinical form, whereas abdominopelvic disease accounts for approximately 20% of cases [3]. Abdominal actinomycosis most commonly involves the ileocaecal region; therefore, mesenteric involvement of the transverse colon is rare. Its infiltrative nature and tendency to form mass-like lesions may mimic malignancy, inflammatory bowel disease, or tuberculosis, often making preoperative diagnosis challenging [4-5].

We report a rare case of mesenteric actinomycosis involving the transverse colon, highlighting the importance of including actinomycosis in the differential diagnosis of mesenteric and colonic masses due to non-specific symptoms (chronic pain, weight loss, fever), the absence of specific biomarkers, culture often being negative as it is a fastidious anaerobe, and radiology mimicking a tumor/foreign body.

Case Presentation

A 59-year-old male laborer of Dravidian ethnicity presented with recurrent episodes of upper abdominal

pain for one month. The pain had an insidious onset, was squeezing in nature, non-radiating, and relieved by over-the-counter analgesics. No aggravating factors were identified, and the pain was not related to food intake. The patient reported no vomiting, dyspepsia, jaundice, or altered bowel habits. He also denied constitutional symptoms, including fever, loss of appetite, and weight loss. There was no history of similar complaints. His medical history included hypertension and diabetes mellitus. Surgical history was notable for excision of a sebaceous cyst under local anaesthesia in the epigastric region one year earlier, without any documented postoperative infection. The patient consumed alcohol occasionally and followed a mixed diet.

Local examination

Inspection revealed an abdominal lump in the left hypochondriac region, extending into the epigastric and umbilical regions. The mass measured 10 × 8 cm, was elliptical in shape, had ill-defined margins, and was covered by normal skin. It moved with respiration and became less prominent on leg-raising and head-raising tests. Palpation confirmed the inspection findings. The swelling was non-tender, soft to firm in consistency, with an irregular surface, ill-defined margins, restricted mobility, and moved with respiration. No signs of local inflammation were observed. The remainder of the abdominal examination was normal, except for a healthy, healed 2-cm horizontal scar in the epigastrium corresponding to the previous sebaceous cyst excision. No palpable inguinal or supraclavicular lymphadenopathy was present. Digital rectal and genital examinations were unremarkable. Other systemic examinations were normal. Clinical differential diagnosis included mesenteric cyst and colonic malignancy.

Laboratory investigations

Complete blood count was normal. Both liver and renal function tests were within normal limits. Fasting blood sugar level: 86 mg/dL (70-100 mg/dL); postprandial sugar level: 180 mg/dL (<140 mg/dL); glycated hemoglobin (HbA1c): 8.8% (<5.7%); carcinoembryonic antigen (CEA): 2.3 ng/mL (0-5.0ng/mL); alpha-fetoprotein (AFP): 3.0 ng/mL (0-10ng/mL); carbohydrate antigen 19-9 (CA19-9): 8.99 U/mL (0-37 U/mL); serum amylase: 41 U/L (30-110 U/L); and serum lipase: 62 U/L (0-160 U/L). Serological tests for HIV, hepatitis B surface antigen (HBsAg), and hepatitis C virus (HCV) were negative.

Radiological investigations

Ultrasonography

An ill-defined hyperechoic mass measuring 6 × 5.6 × 5.2 cm, without internal vascularity, was noted in the left lumbar region.

Contrast-enhanced computed tomography (CECT) abdomen

A heterogeneous, ill-defined intraperitoneal mass measuring approximately 86 × 71 × 53 mm was identified in the left lumbar region, anterior to the transverse colon. The mass showed surrounding fat stranding, a few internal air shadows, and a linear hyperdensity with marked post-contrast enhancement, as shown in Figure *1* and Figure *2*.



FIGURE 1: CECT axial section showing a mass at the transverse colon

CECT: contrast-enhanced computed tomography



FIGURE 2: CECT coronal section showing a mass at the transverse colon.

CECT: contrast-enhanced computed tomography

A hypodense collection was noted in the dependent portion. Significant post-contrast enhancement was noted. Radiological differential diagnoses considered included gossypiboma and colonic malignancy with abscess formation. Mild wall thickening of the adjacent transverse colon was also noted, suggestive of colitis.

Colonoscopy

The mucosa appeared pale and whitish, with luminal narrowing at 100 cm from the anal verge, corresponding to the transverse colon, likely due to external compression. No mucosal ulceration or intraluminal growth was noted. The scope was negotiated beyond the narrowing, as shown in Figure *3*.

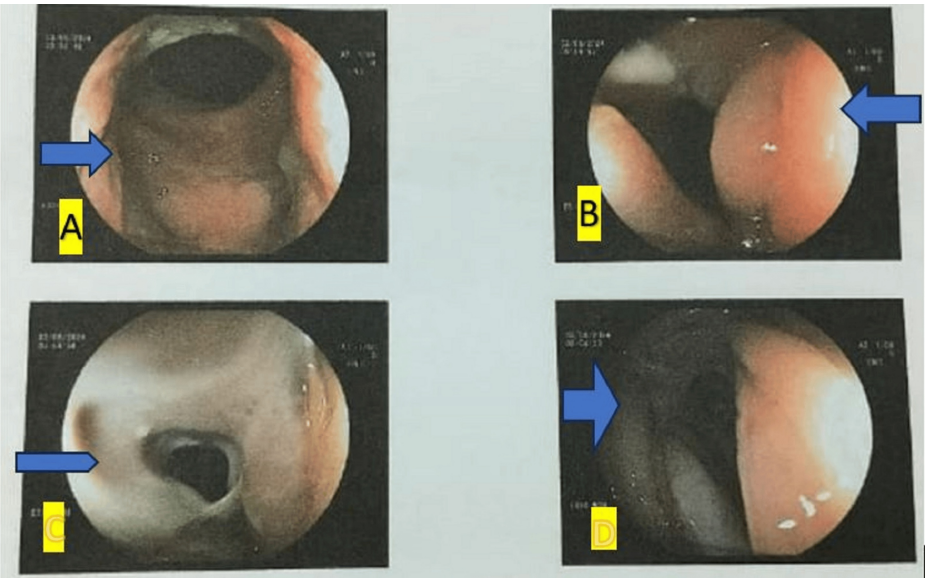


FIGURE 3: Colonoscopy images showing normal mucosa with narrowing of the transverse colon, probably due to external compression.

Image A: Showing normal mucosa

Image B: External compression of the lumen

Image C: Luminal narrowing

Image D: Narrow colonic lumen with normal mucosal surface

Intraoperative findings

On exploratory laparotomy, a mass involving the transverse colon and medial wall of its mesentery was identified. An inspissated pus pocket adherent to the anterior abdominal wall in the left lumbar region was noted, as shown in Figure *4* and Figure *5*.

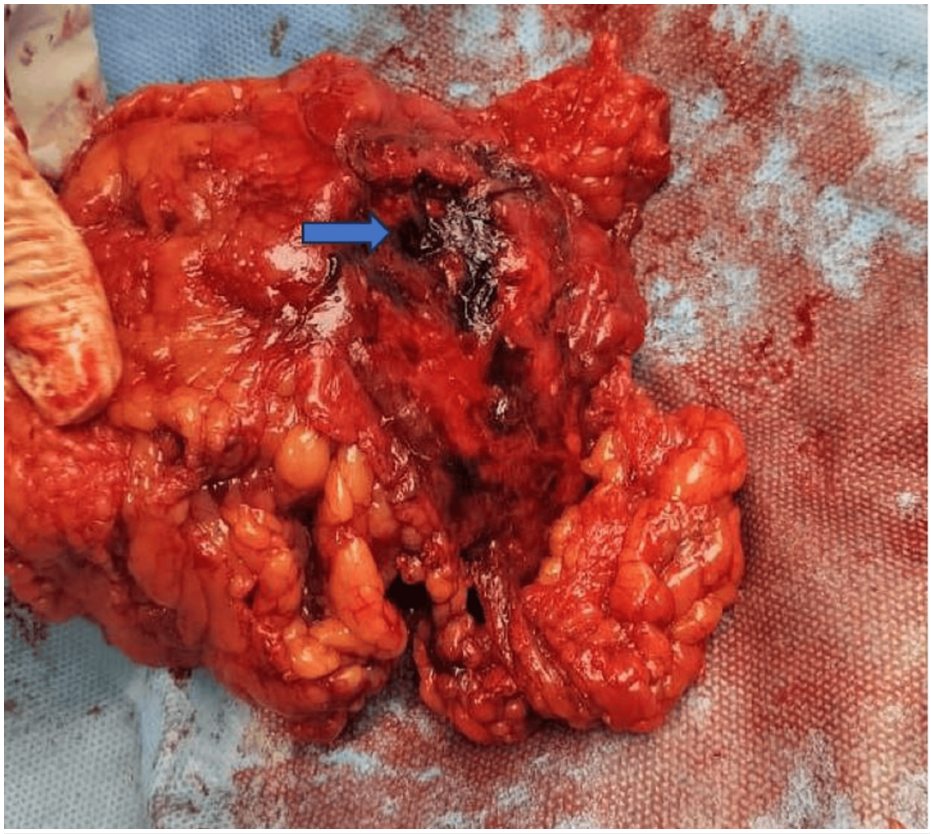


FIGURE 4: Intraoperative image shows a gross specimen showing a mesenteric mass with inflammation and focal areas of necrosis (blue arrow)

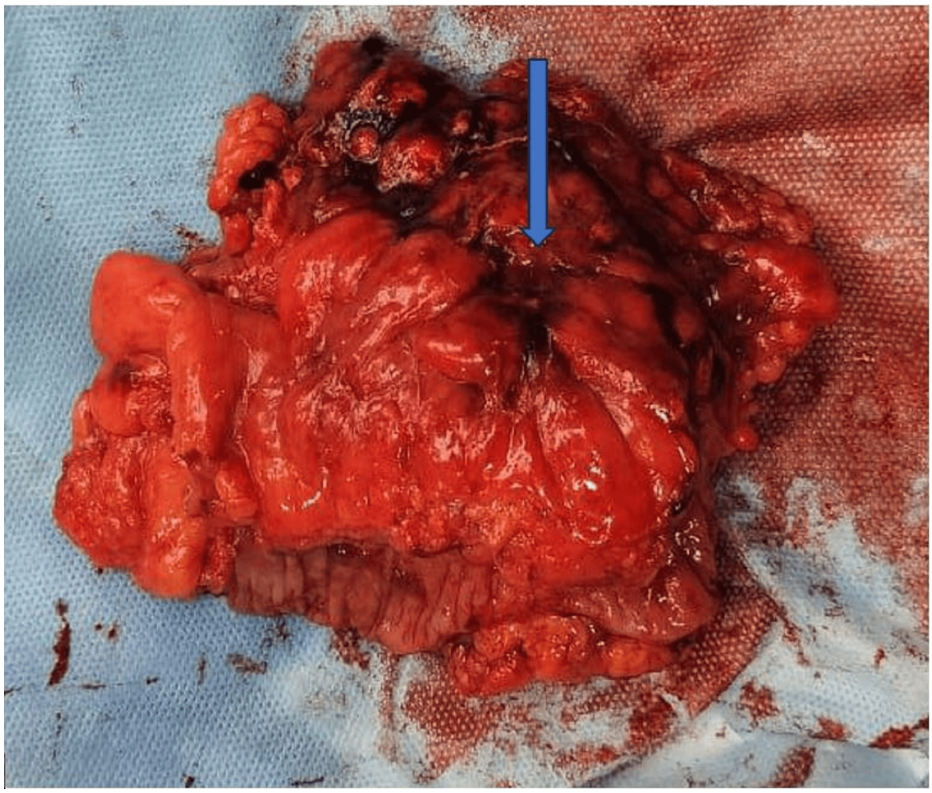


FIGURE 5: Intraoperative image shows a gross specimen showing a mesenteric mass with inflammation and focal areas of necrosis (blue arrow).

The overlying omentum covered the lesion. Approximately 10 cm of the transverse colon was resected, as shown in Figure *6*, followed by colo-colic anastomosis and creation of a defunctioning loop ileostomy. The colonic mucosal layer was normal, as shown in Figure *7*. The remaining large bowel loops, small intestine, and liver appeared normal. No foreign body or suture material was found, thus excluding gossypiboma.

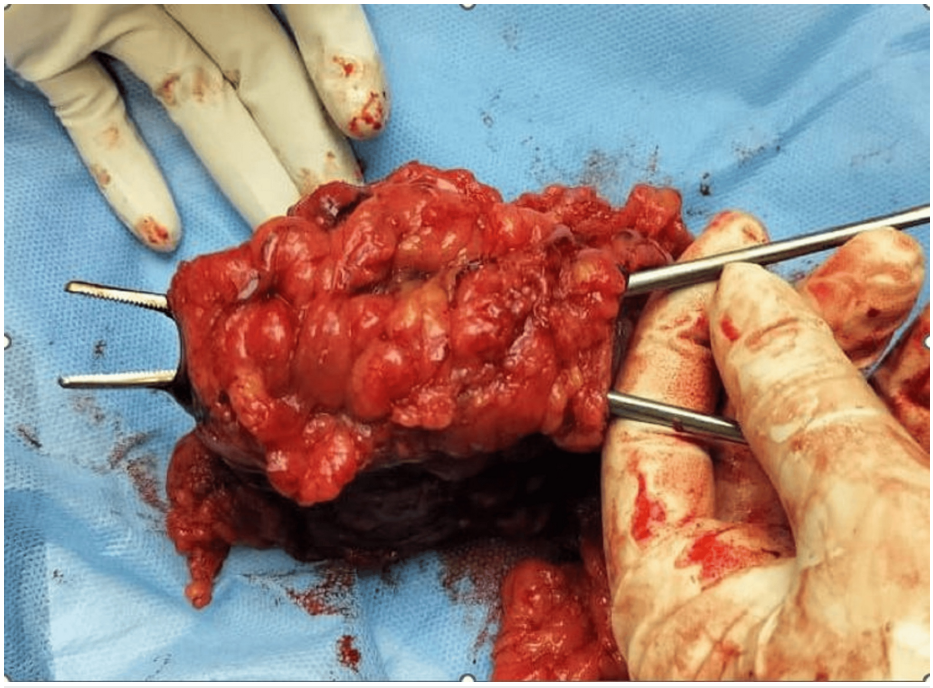


FIGURE 6: Intraoperative image showing the resected specimen of the transverse colon, 10 cm in length, with adjacent mesocolon showing fat stranding.

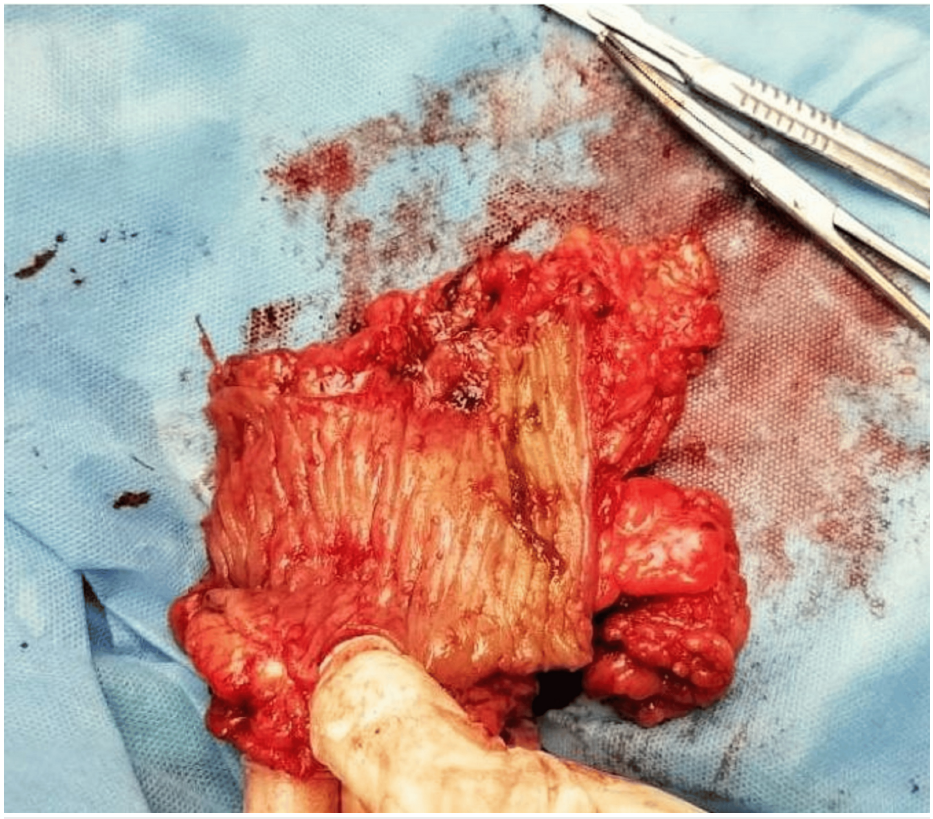


FIGURE 7: Intraoperative image showing the cut section of the transverse colon showing normal mucosal lining.

The postoperative period was uneventful. The patient was started on injection ceftriaxone 1 g IV and

injection doxycycline 100 mg IV 12-hourly. The stoma was functional on postoperative day 2, and an oral diet was allowed as per Enhanced Recovery After Surgery (ERAS) guidelines and was well tolerated. The patient was subsequently discharged on oral medication and advised to follow up after the histopathology report.

Histopathology report

Sections from the mesenteric mass revealed extensive sheets of foreign-body giant-cell reaction, as shown in Figure *8*. The inflammatory infiltrate comprised neutrophils, lymphocytes, histiocytic aggregates, and multinucleated giant cells of both Langhans and foreign-body types, in response to bacterial colonies. These bacterial colonies consisted of filamentous, gram-positive bacilli arranged in rosette-like clusters, surrounded by eosinophilic radiating clubs - characteristic of the Splendore-Hoeppli phenomenon (sulfur granules) consistent with *Actinomyces* species, as shown in Figure *9*.

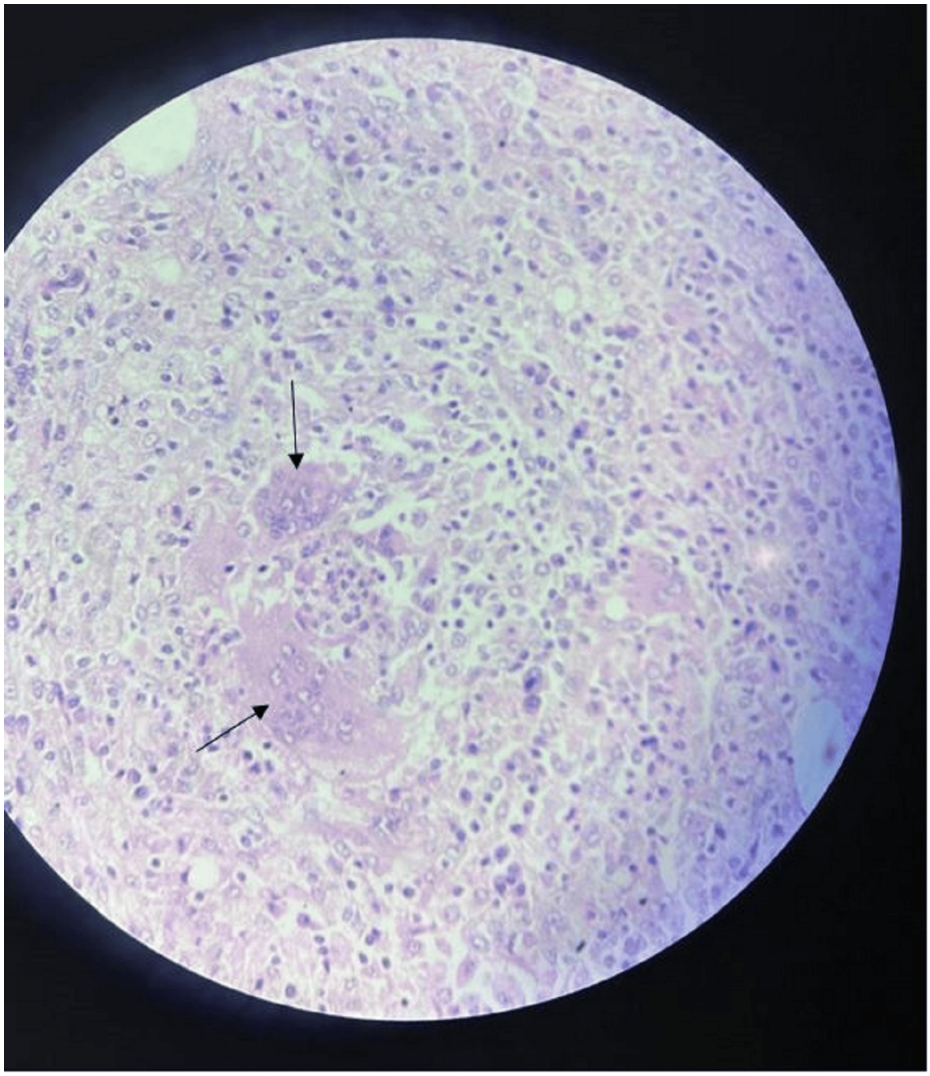


FIGURE 8: Histopathological examination showing sheets of foreign body giant cell reaction

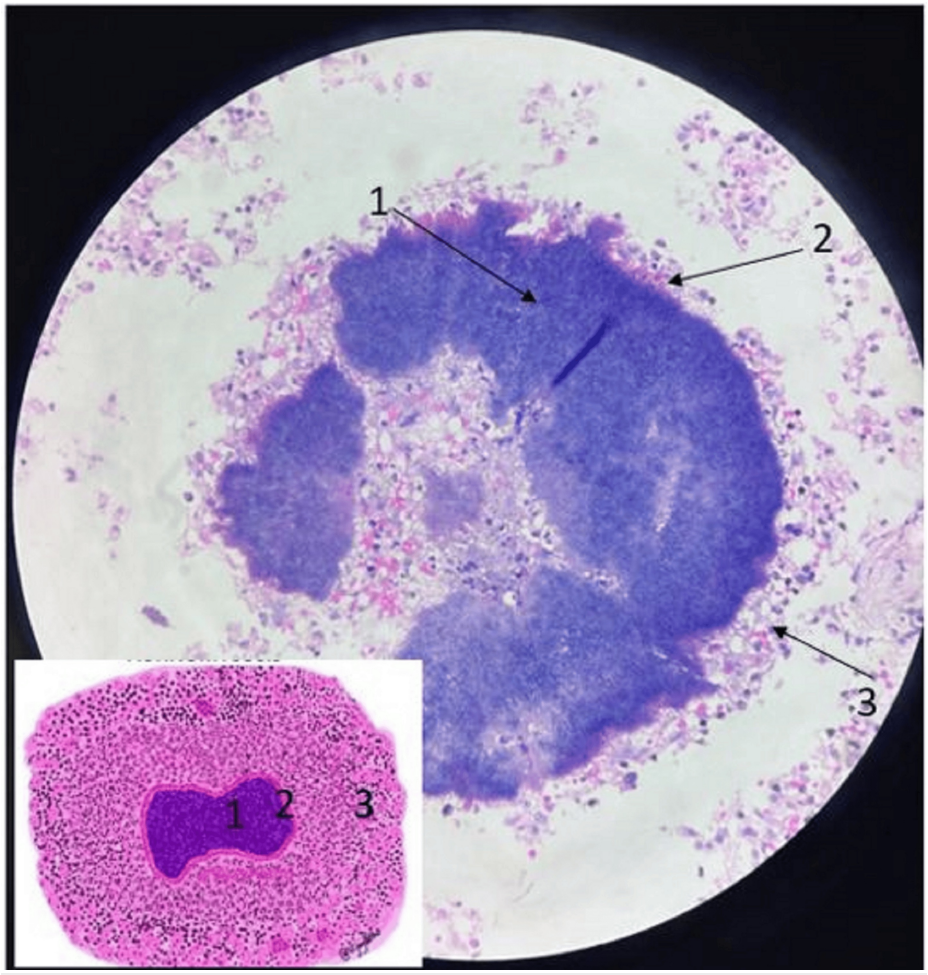


FIGURE 9: Splendore-Hoepplii phenomenon

1. Granule of Gram-positive bacteria with branching filaments.

2. Eosinophilic amorphous material with club shaped configuration surrounding granule.

3. Neutrophils and lymphohistiocytic cells.

In some areas, the colonies extended up to the lamina propria of the colon. Corresponding to the mesenteric abscesses, the colonic mucosa showed focal erosions associated with dense lymphoplasmacytic and neutrophilic infiltrates. No architectural distortion, cryptitis, crypt abscesses, caseating necrosis, dysplasia, or malignancy was observed. Sections from the mesocolon showed congested blood vessels with moderate chronic inflammatory infiltrates. Findings were suggestive of abdominal actinomycosis.

Follow-up

Following consultation with a general physician, the patient was started on oral amoxicillin and clavulanate 625 mg TID for 4 months. Treatment should generally be continued for at least 2 to 6 months in mild disease and for 6 to 12 months in severe disease. The rationale for prolonged therapy is to prevent recurrence, as *Actinomyces* can persist in fibrotic tissue. Response to treatment should be monitored carefully using inflammatory markers and computed tomography or magnetic resonance imaging before cessation of therapy.

On subsequent follow-up visits, the patient was asymptomatic, tolerating a normal diet, with healthy stoma function and no complaints of fever, abdominal pain, or wound discharge. Reversal of the defunctioning stoma was performed after 6 months. The post-reversal course was uneventful. After stoma reversal, the patient was followed up for one more month with no fresh complaints and was advised to follow up as needed.

Discussion

In the present case, histopathology revealed inflammatory infiltrates, multinucleated giant cells, and *Actinomyces* colonies with the Splendore-Hoeppli phenomenon, consistent with mesenteric actinomycosis involving the transverse colon. *Actinomyces israelii* is a Gram-positive filamentous bacillus belonging to the genus *Actinomyces*, a normal commensal of the oral cavity, bronchial tree, and upper gastrointestinal tract that can become pathogenic after disruption of the mucosal barrier, causing chronic granulomatous infection [6]. Abdominal actinomycosis accounts for approximately 20% of all actinomycosis cases [7], with the ileocecal region being most common; mesenteric involvement of the transverse colon, as seen in our patient, is rare.

Unlike typical cases, our patient had no history of recent or remote bowel surgery such as perforated appendicitis or colonic diverticulitis, which are commonly reported in abdominal actinomycosis [6,7]. Ingestion of foreign bodies such as fish or chicken bones may facilitate introduction of actinomycetes into deeper tissues. Our patient had no significant history apart from a minor procedure of sebaceous cyst excision in the epigastric region under local anesthesia one year earlier, which does not predispose to abdominal actinomycosis.

Clinically, our patient presented with recurrent upper abdominal pain and a palpable mass in the left hypochondrium and umbilical region, mimicking a mesenteric cyst or colonic carcinoma. Gallbladder involvement can also be seen but is rare and may clinically and radiologically mimic chronic cholecystitis [8]. Such nonspecific presentation is characteristic, as abdominal actinomycosis often mimics malignancy, tuberculosis, or inflammatory bowel disease, making preoperative diagnosis difficult due to rarity and absence of specific clinical or radiological features [9,10].

In our case, contrast-enhanced computed tomography showed an 86 × 71 × 53 mm heterogeneous mass anterior to the transverse colon with fat stranding, air foci, and a linear hyperdense component, raising a radiological differential of gossypiboma in addition to malignancy. Colonoscopy showed extrinsic compression with preserved mucosa, arguing against primary colonic carcinoma. Common CT findings include bowel-wall invasion with stricture formation, luminal narrowing due to mass effect, and thickened mucosal folds, but these are nonspecific [9,11].

In our case, gossypiboma was considered only as a radiological differential diagnosis due to imaging appearance; it was excluded intraoperatively as no foreign body was found. Management in our case required exploratory laparotomy with resection of approximately 10 cm of transverse colon, colocolic anastomosis, and defunctioning loop ileostomy due to extensive involvement, necrotic areas, and pus pockets adherent to the left lumbar wall.

While high-dose penicillin remains the treatment of choice [12], with intravenous penicillin for several weeks followed by prolonged oral therapy individualized by disease severity and clinical response, our patient received oral amoxicillin-clavulanate for four months after infectious disease consultation, with a favorable outcome and ileostomy reversal at six months. Alternative agents for penicillin-intolerant patients include ceftriaxone, doxycycline, macrolides, and carbapenems [13].

Conclusions

In summary, abdominal actinomycosis, most commonly caused by *Actinomyces israelii*, can mimic malignancy, making preoperative diagnosis particularly challenging. This case involved a 59-year-old man who presented with abdominal pain and an intra-abdominal mass that was initially suspected to be malignant. Histopathological examination established the diagnosis of *Actinomyces israelii* infection, and the patient was successfully treated with surgery and antibiotic therapy. This case underscores the importance of considering actinomycosis in the differential diagnosis of abdominal masses, particularly when radiological and endoscopic findings are inconclusive, to avoid extensive oncological resections and ensure appropriate prolonged antibiotic treatment.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Reshma Devi Hamilpur, Dinesh Donthoju, Vinod Kumar, Eesha Agarwal

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Drafting of the manuscript: Reshma Devi Hamilpur, Nandkishor Sopanrao Sude, Dinesh Donthoju, Vinod Kumar, Eesha Agarwal

Critical review of the manuscript for important intellectual content: Reshma Devi Hamilpur, Nandkishor Sopanrao Sude

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Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. Institutional Ethics Committee, ESIC Medical College and Hospital, Sanathnagar, Hyderabad issued approval Not Applicable. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments. Written informed consent was obtained from the patient for publication of this case report and accompanying de-identified images. The patient was informed that all identifying information would be kept confidential and that the article would be published in an open-access journal. No IRB approval is required for a single case report at our institution as per institutional policy. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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