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CASE STUDY

UNUSUAL CASE OF ABDOMINOPELVIC ACTINOMYCES ASSOCIATED WITH ACTINOMYCES TURICENSIS IN CHRONIC KIDNEY DISEASE

Sathesini Priya A.S[1], Vithiya G[2], Ramesh A[3], Rajendran T[4], Srividhya M[5]

[1]*Assistant Professor, Department of Microbiology, Velammal medical college hospital and research institute, Anupannadi, Madurai, Tamil nadu, India -625009*
[2]*Assistant Professor, Department of Microbiology, All India Institute of Medical Sciences, Madurai, Tamil nadu, India -625009*
[3]*Professor, Department of Microbiology, Velammal medical college hospital and research institute, Anupannadi, Madurai, Tamil nadu, India -625009*
[4]*Professor, Department of Microbiology, Velammal medical college hospital and research institute, Anupannadi, Madurai, Tamil nadu, India -625009*
[5]*Assistant Professor, Department of Microbiology, Velammal medical college hospital and research institute, Anupannadi, Madurai, Tamil nadu, India -625009*

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ABSTRACT: Actinomyces turicensis are branching, filamentous gram positive, non-sporing bacilli which belongs to the Phylum Actinobacteria and Order Actinomycetales and are indigenous microbiota, particularly the gastrointestinal and genitourinary system. Actinomycosis caused by Actinomyces species is a chronic granulomatous infection which can be thoracic, orocervicofacial and abdominopelvic forms. Case: We present an unusual manifestation of Abdominal actinomyces due to Actinomyces turicensis which presented in an established case of chronic kidney disease and systemic hypertension. Conclusion: This case highlights the rare involvement of Actinomyces turicensis in abdominal actinomycosis and emphazises the need for clinical awareness, especially in patients with significant comorbidities such as chronic kidney disease.

KEY WORDS: Actinomyces turicensis, Abdominal actinomyces, chronic kidney disease.

Corresponding Author:
Dr.A.S.Sathesini Priya MD,
7 A, Vaigai Block, Velammal medical college hospital and research institute, Anupannadi, Madurai, Tamil nadu-625009
E-Mail: drsathesinipriya@gmail.com

INTRODUCTION:

Actinomyces turicensis are branching, filamentous gram positive, non-sporing bacilli which belongs to the Phylum Actinobacteria and Order Actinomycetales. Over 30 species of Actinomyces have been reported so far, among them Actinomyces Israeli has been the most commonly occurring species. First discovered in 1995 using 16S rRNA gene sequencing, Actinomyces turicensis are known to cause a spectrum of clinical symptoms, including: cutaneous manifestations, genito-urinary infections, breast abscess, hepatic abscess with infection-induced thrombotic thrombocytopenic purpura, Bacteremia and appendicitis [1]. Here we describe a case of chronic kidney disease and systemic hypertension who developed Abdominal actinomyces by Actinomyces turicensis.

CASE DISCUSSION:

A 42-year-old male residing in Peraiyur, Madurai visited the emergency room with complaints of abdomen pain for 1 week along with fever. The abdomen pain was sudden in onset, gradual in progression, originating from the anterior abdominal wall radiating to the back associated with nausea and vomiting. Fever was low grade and intermittent for past 2 days. No history of headache, chest pain, palpitation or breathlessness was present. Patient was a known case of systemic hypertension for 5 years and chronic kidney disease (CKD) for 4 years requiring hemodialysis weekly twice. On examination, abdomen was soft and tenderness was present in left hypogastric and left iliac region. Local examination revealed few firms, mildly tender nodular lesions were present on the anterior abdominal wall, without erythema or fluctuance. No organomegaly was evident. Patient was transferred to the Critical care unit for further management. Computed tomography scan (CT) of abdomen revealed multiple hypodense collection in the abdomen- possible spontaneous hematoma with low hematocrit (Figure 1) and splenomegaly was noted. Blood investigations revealed serum urea level of 178mmol/l, Serum Creatinine value of 10.1mg/dL, Total White blood count of 15400 cells/mm^3(polymorphs-91%, Lymphocytes- 3%) and Hemoglobin of 7.2 g/dl. CRP level was 32mg/dl. Patient was treated empirically on Injection Piperacillin tazobactam and Injection Vancomycin 1g thrice weekly. He was hemodialysed during the admission with the existing left Arteriovenous fistula. Serological test for Dengue, Leptospirosis, Scrub typhus, WIDAL was done and were negative. Patient developed secondary metabolic acidosis secondary to CKD, sepsis with spontaneous bleeding manifestation. Ultrasound guided aspiration of ascitic fluid was sent for bacterial culture and Acid-Fast stain. Samples were innoculated onto Blood agar, Chocolate agar and anaerobic media (Thioglycolate broth), and incubated at 37°C with regular inspection for colony growth. Blood and urine culture were sterile and Acid-Fast stain was negative. Ascitic fluid culture showed growth anerobically after 7 days and smear examination showed long filamentous branching Gram positive bacilli (Figure 2). On further analysis, the bacilli were identified as Actinomyces turicensis by MALDI-TOF. Postoperatively, patient was started on Intravenous high dose Penicillin G followed by oral Amoxicillin 500 mg, every 8 hours for 6 months. Patient showed signs of improvement and remained afebrile for more than 48 hours and hence discharged with advice to continue oral antibiotics for a period of 6 months, with close follow up. Complete resolution of the lesions was seen in Follow up imaging which was done at three months and six months after discharge.

DISCUSSION:

Actinomyces turicensis are branching, filamentous gram positive, non-sporing bacilli and are indigenous microbiota, particularly the gastrointestinal and genitourinary system. They have been reported to cause infection on disruption of mucosal barriers either following trauma or surgical instrumentation. Actinomycosis caused by *Actinomyces* species is a chronic granulomatous infection which can be thoracic, orocervicofacial and abdominopelvic forms. Abdominal actinomycosis accounts for 20% of all

actinomycosis cases and it most commonly affects middle-aged men [2]. Diagnosis of these cases are formidably difficult, only 10% gets diagnosed before surgery. Factors such as use of prior antibiotics, presence of contaminant organisms, incorrect culture techniques such as temperature or shorter incubation periods can hinder the culture and identification thus leading to isolation only in minority samples [3].

Incubation for isolating Actinomyces turicensis requires 5-20 days and minimum incubation of 10 days is required to conclude negative. Culture should be done anaerobically using an enriched medium like chocolate agar or semi-selective agar which can prevent the overgrowth of concomitant or contaminant microorganisms. Identification of the organism based on phenotypic methods or commercially available biochemical kits can lead to misdiagnosis thus making Molecular methods such as Polymerase chain reaction (PCR) more reliable for isolating the pathogenic bacteria from the clinical specimens especially with specific primers. Advanced techniques like MALDI-TOF may be used for more precise identification of Actinomyces.

Prolonged antimicrobial therapy is the cornerstone of managing actinomycosis especially abdominal type because of the dense fibrotic tissue formation, the chronic suppurative nature of the infection and the associated risk of relapse if therapy is discontinued prematurely [4]. Given these considerations and the patient's comorbid status, a 6-month course of antibiotics was given to ensure complete eradication of the pathogen and also to reduce the recurrence risk.

This case represents an uncommon manifestation of Abdominal actinomycosis caused by Actinomyces turicensis, adding more data to the limited literature. The patient's chronic kidney disease and systemic hypertension likely contributed to an immunocompromised state, predisposing to an atypical infection. This highlights the role of host factors in the pathogenesis of the disease and suggests that CKD patients may be at higher risk for unusual pathogens. Only few cases of abdominal actinomycosis are reported especially in CKD cases, thus making this case report add more valuable data for clinicians and researchers regarding host risk factors and treatment outcomes.

CONCLUSION:

Actinomyces turicensis requires prolonged incubation upto 10 days in anaerobic condition for detection of growth and certain microscopic findings such as presence of yellow granules in necrotic areas and presence of branching filamentous Gram-positive bacteria may aid in diagnosis. Histopathological findings and bacterial cultures remain the keystone in diagnosis despite the challenges. Awareness about the typical clinical picture as well as the ability of the bacteria to masquerade as malignancy would help the clinicians in combating the infection at the earliest with less complications. Clinicians should consider actinomycosis in patients presenting with chronic, nonspecific abdominal symptoms, especially when underlying comorbidities are present, and ensure an adequate duration of antimicrobial therapy for optimal outcomes.

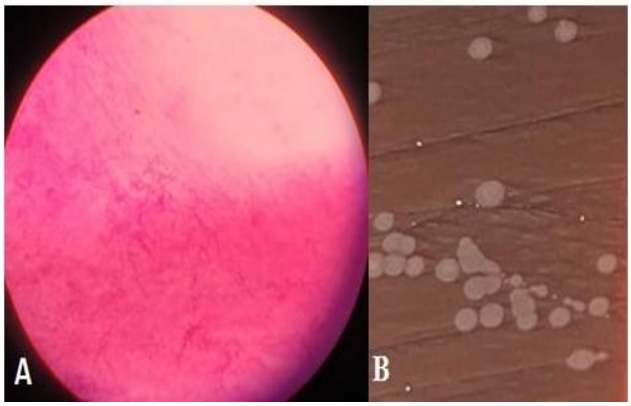

Figure 1: A. Long Gram positive filamentous bacilli demonstrated by gram stain; B. chocolate agar showing tan-white, creamy colonies.

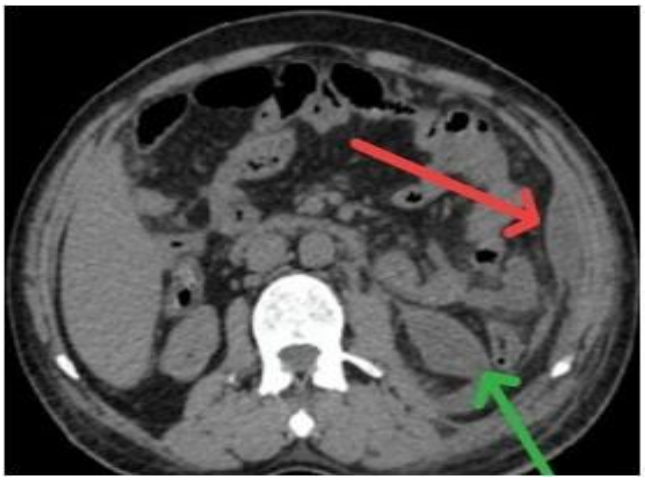

Figure 2: Computed tomography image of abdomen showing multiple hypodense collection in the abdomen

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