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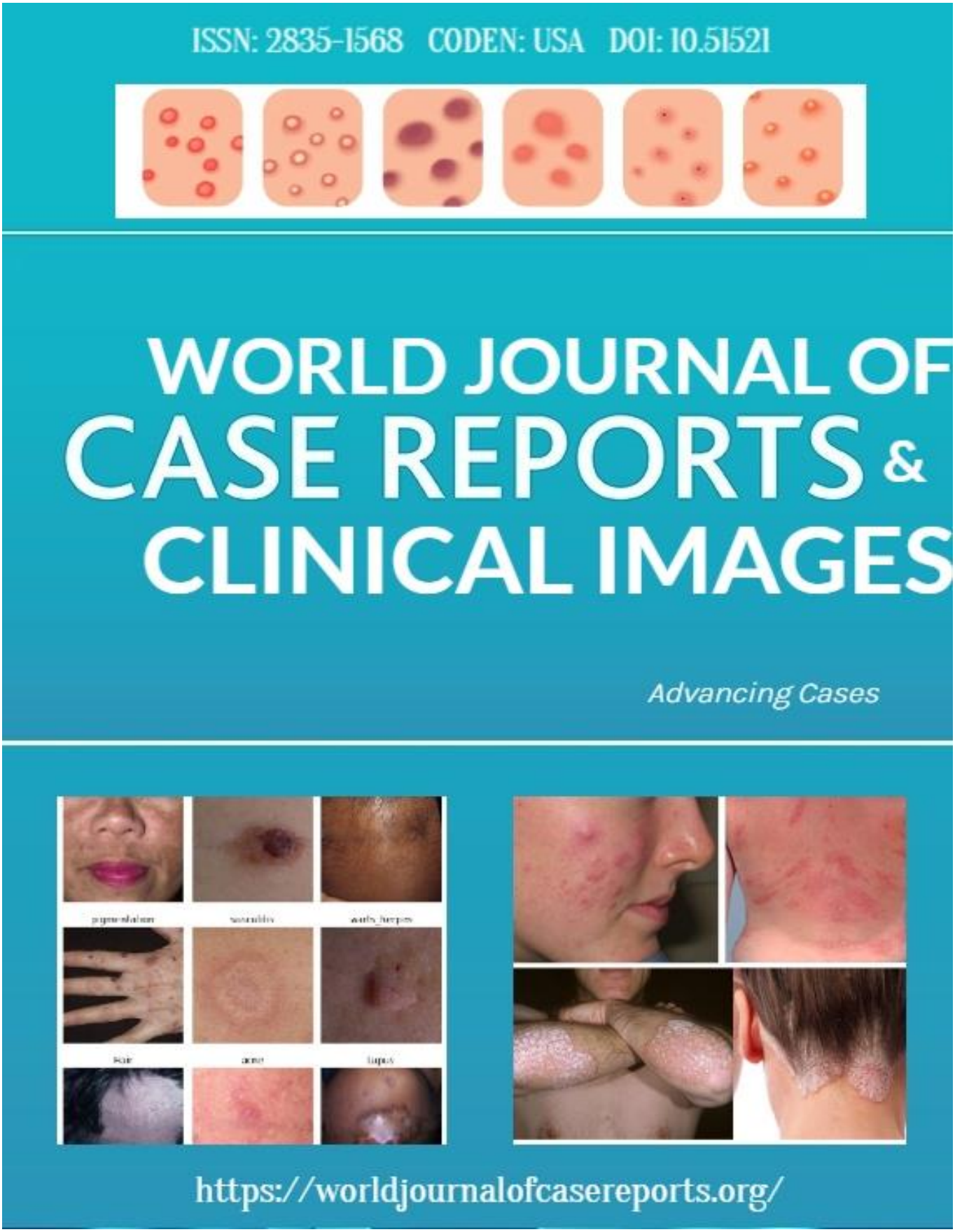

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A CASE REPORT

Delayed Diagnosis of Esophageal Actinomycosis: A Case Report

Chesney Skaggs, M.D.

Chesney Skaggs, M.D., University of Arkansas for Medical Sciences Northwest, Fayetteville, Arkansas

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Corresponding Author:
Chesney Skaggs, M.D., University of Arkansas for Medical Sciences Northwest, Fayetteville, Arkansas.

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Abstract

Actinomycosis is an uncommon bacterial infection caused by the *Actinomyces* species. While these bacteria are part of the normal human flora, infection can occur after injury to the mucosal barrier in the setting of certain risk factors. Actinomycosis may involve multiple sites with a variety of presentations requiring a high index of suspicion for diagnosis. We report the case of a 69-year-old female with stage IV breast cancer presenting with odynophagia and epigastric pain. Esophagogastroduodenoscopy (EGD) was remarkable for Grade D esophagitis and a malignant-appearing esophageal stenosis. Histopathology revealed colonies of *Actinomyces* spp, initially thought to be an incidental finding. Subsequently, the patient was hospitalized with worsening esophageal symptoms and associated weight loss. CT chest showed mid-esophageal wall thickening with surrounding mediastinal attenuation. Given her clinical picture and prior EGD findings, treatment for esophageal actinomycosis with IV penicillin G was initiated. After one month, the patient was transitioned to oral antibiotics and completed a six-month course for actinomycosis with resolution of symptoms. This case highlights a rare presentation of esophageal actinomycosis and the importance of early recognition and treatment.

Keywords:

- Actinomycosis
- Esophageal Actinomycosis
- Odynophagia
- Dysphagia
- Esophagitis

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Introduction:

Actinomyces species (spp.) are filamentous, gram-positive, anaerobic bacteria that are typically considered innocuous colonizers. They are found in normal flora of various sites including the oropharynx, intestinal tract, and urogenital tract [1]. Over twenty species have been in found in the human microbiome, with *A. israelii* and *A. gerencseriae* being the most commonly associated with disease [1]. Actinomycosis arises after a breach in the mucosal barrier, allowing the bacteria to invade deeper tissues, typically over weeks to months. Invasion of the bacteria incites an inflammatory response with the characteristic formation of granulomatous tissue and fibrosis. Classically, the infection progresses through tissue planes, and forms abscesses, fistulas, and sinus tracts that can heal and re-form [2].

Diagnosis of actinomycosis is often difficult as the infection can occur in multiple sites with non-specific symptoms, and its indolent nature can mimic other disease processes including malignancy [3]. The most common site for actinomycosis to occur is the orocervicofacial region in the setting of poor oral hygiene and invasive dental procedures. Abdominopelvic actinomycosis is the second most common presentation and is associated with long-standing Intrauterine Devices (IUDs) and diverticulitis with perforation, as well as appendicitis [4,5].

Definitive diagnosis relies on isolation on either culture or histopathology. Isolation of *Actionmyces* spp is difficult with a high failure rate. This is likely multifactorial due to overgrowth of other organisms, and failure to meet specific requirements needed for appropriate culture of the organisms [2,6]. On histopathology, identification of gram-positive filamentous organisms and the presence of sulphur granules is supportive of the diagnosis. Sulphur granules represent colonies of organisms that appear as basophilic masses with radiating eosinophilic peripheral clubs [7].

Here we present a rare presentation of actinomycosis involving the esophagus. This case highlights the importance of considering Actinomyces infection in the differential for a patient presenting with odynophagia and dysphagia, and how lack of familiarity with the disease can lead to delays in diagnosis and treatment.

Case Presentation:

We present a case of a 69-year-old female with Stage IV breast cancer with right upper lobe (RUL) lung metastatic lesion presenting to clinic with six-week history of epigastric pain and odynophagia. Notably, two months prior patient completed her final cycle of chemotherapy (THP) with concurrent radiotherapy (XRT) to RUL lesion, and was on current treatment with pertuzumab and trastuzumab. The patient denied any alcohol or non-steroidal anti-inflammatory use. Treatment for suspected gastroesophageal reflux was initiated with proton-pump inhibitor (PPI). Four weeks later, after her symptoms failed to improve, she was referred to gastroenterology for esophagogastroduodenoscopy (EGD).

This was remarkable for Grade D esophagitis, noting 8 cratered esophageal ulcers in the mid-esophagus and one malignant appearing esophageal stenosis. The gastroesophageal junction was normal. The biopsy returned negative for malignancy. Histopathology of the biopsy was notable for bacterial colonies consistent with *Actinomyces*. Cultures were negative. Antibiotics were deferred as the colonies of *Actinomyces* were felt to be an incidental finding. The patient was continued on PPI treatment. Six weeks later, the patient presented with worsening epigastric pain, odynophagia and dysphagia, along with an associated 20-pound weight loss. Labs were significant for mild leukocytosis with left shift.

Computed tomography (CT) of the chest with contrast performed showed circumferential wall thickening of the mid-esophagus with prominent soft tissue attenuation of the surrounding mediastinum, concerning for esophageal or mediastinal mass. Infectious disease was consulted. Given the severity of symptoms and prior EGD findings, IV penicillin G was initiated for treatment of esophageal actinomycosis. After one month, she was transitioned to amoxicillin-clavulanate to complete a 6-month course with resulting resolution of her symptoms.

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Discussion:

Actinomycosis is a rare infection that poses diagnostic challenges due to the diverse ways in which it can present, its indolent nature, and certain limitations of laboratory diagnosis. This case highlights those challenges and the need for increased awareness of *Actinomyces* infection as an etiology for ulcerative esophagitis and esophageal stenosis.

A significant risk factor for the development of actinomycosis is immunosuppression, while other predisposing factors include diabetes mellitus and malnutrition [3]. In this case, the patient's history of breast cancer with ongoing immunosuppression likely set the stage for the infection to take root.

As the presence of Actinomyces on histopathology can be an incidental finding and cultures may not be reliable, the clinical picture must also play a role in determining if active infection is present. While a limited number of other esophageal actinomycosis cases have been reported, odynophagia and dysphagia are the most commonly reported symptoms along with weight loss, chest pain, and epigastric pain [8]. Significant EGD findings for reported cases include ulcers, strictures, and white plaques. One such case described a refractory esophageal ulcer where repeat biopsy demonstrated actinomycosis [9]. Notably, the tendency for *Actinomyces* to mimic malignancy is also a phenomenon of esophageal actinomycosis, at times even presenting as a mass on endoscopy and imaging, as was the case for our patient [10].

Unfortunately, in our patient's case, her worsening symptoms and failure of other conservative management led to the diagnosis rather than her initial presentation, EGD findings, and the identification of *Actinomyces* colonies on histopathology.

Conclusion:

This case underscores the importance of maintaining a high index of suspicion for esophageal actinomycosis, particularly in immunocompromised patients with atypical or refractory esophageal symptoms. Early consideration of actinomycosis in the differential diagnosis, especially when histopathologic findings reveal *Actinomyces* spp, may facilitate timely initiation of appropriate antibiotic therapy and avoid unnecessary delays or misdiagnosis. Clinicians should be aware of this rare but treatable condition to ensure optimal patient outcomes through prompt recognition and early initiation of antibiotics.

Disclosures/Declaration of Interest:

The authors declare that they have no disclosures or conflict of interest.

Acknowledgment: None.

Conflict of Interest:

The authors have no conflict of interest. Also, the authors declare that we have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethics Approval:

Not applicable.

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