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CASE REPORT

Cervicofacial Actinomycosis Mimicking a Tumor in a Child

Samia BICHA [1,2,3], Nadim ABDELMOUMEN[4]

ABSTRACT

Cervicofacial actinomycosis is a rare bacterial infection in children that often presents with nonspecific symptoms mimicking malignancy or other inflammatory processes, posing significant diagnostic challenges. We report the case of a 3-year-old boy who presented with a one-month history of a painless, firm, immobile 10 cm mass on the left side of his neck, following a brief febrile episode. Physical examination revealed a hard, non-tender mass fixed to deep structures with associated satellite lymphadenopathy, while the oral cavity appeared normal. Initial inflammatory markers were unremarkable, and bacteriological analysis of the ultrasound-guided biopsy was negative, likely due to prior antibiotic exposure and suboptimal anaerobic culture conditions. Cervical computed tomography demonstrated a heterogeneous mass infiltrating adjacent muscles. The diagnosis was ultimately confirmed by histopathological examination, which revealed a mixed inflammatory infiltrate with granulomatous features and characteristic actinomyces grains. The patient was successfully treated with a 21-day course of intravenous ceftriaxone — owing to a documented penicillin allergy — followed by oral antibiotic therapy, for a total treatment duration of six weeks, resulting in complete resolution of the lesion. This case underscores the importance of maintaining a high index of suspicion for cervicofacial actinomycosis in children presenting with persistent cervical masses, particularly in the context of a preceding febrile episode. It further highlights that a multidisciplinary approach integrating clinical assessment, imaging, and histopathology is essential for timely diagnosis and effective management.

Keywords: Actinomycosis, Cervicofacial, Neck Mass, Children, and Diagnosis.

1- Constantine 3 University. 2- Research Laboratory LR2M. 3- Pediatrics Department B, Constantine University Hospital Center. 4- Pathological Anatomy Laboratory, Constantine University Hospital Center – Algeria.

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Correspondance to: Samia BICHA
E-mail : samia.bicha@univ-constantine3.dz

1. INTRODUCTION

Actinomycosis, a rare suppurative infection caused by filamentous bacteria of the genus *Actinomyces*, primarily affects adults, presenting a unique diagnostic challenge in the pediatric population. While uncommon in children, it can involve various organs, with a predilection for the cervicofacial region (1). The diagnosis of cervicofacial actinomycosis, characterized by slow-growing, indolent lesions that often mimic malignancies (2), is further complicated by the widespread use of antibiotics, which may hinder bacterial identification (3). This "masquerading" nature often leads to delayed diagnosis, sometimes for years (4), and increases the risk of severe complications (5).

Despite its rarity, recognizing cervicofacial actinomycosis in children is crucial for ensuring timely and appropriate treatment, thus improving prognosis (6). This is particularly challenging because the clinical presentation is often nonspecific and can easily be mistaken for more common inflammatory or neoplastic conditions (7,8). Clinical presentations are diverse, ranging from hard, immobile masses mimicking tumors to fluctuant abscesses with discharging sinus tracts (9,10). Additionally, cervicofacial actinomycosis can arise in the

context of pre-existing congenital lesions, further complicating the clinical picture (11). Furthermore, confirming the diagnosis often requires specialized laboratory techniques, including prolonged anaerobic cultures and histopathological examination (12). The isolation of *Actinomyces* in cultures is often challenging due to its fastidious nature and the frequent presence of co-infecting microorganisms (3,13).

Although several pediatric case reports and small series have been published, cervicofacial actinomycosis remains infrequently reported in children, particularly in North African and Maghreb regions. To our knowledge, this case represents one of the few pediatric cervicofacial actinomycosis cases reported in this geographical context. The originality of this observation lies in its pseudotumoral presentation, the diagnostic difficulty related to negative bacteriological cultures following prior antibiotic exposure, and the decisive role of histopathological examination in establishing the diagnosis.

Diagnosing and managing actinomycosis in children presents unique challenges compared to adults. Children may struggle to articulate their symptoms accurately, leading to further delays in diagnosis (14). Furthermore, pediatric patients may exhibit atypical presentations, making it more difficult to differentiate actinomycosis from other more common conditions (15). Additionally, obtaining adequate samples for microbiological and histopathological testing can be more difficult in younger children, requiring careful consideration of the child's age and developmental stage. Finally, ensuring adherence to prolonged antibiotic regimens poses a significant challenge in managing pediatric actinomycosis (11).

This paper presents a case of cervicofacial actinomycosis in a 3-year-old boy, where the infection presented as a large, pseudotumoral mass in the left cervical region, initially misdiagnosed as a simple inflammatory process. We will discuss the diagnostic challenges encountered in this case, specifically the initial misdiagnosis and the role of imaging and biopsy in reaching the final diagnosis. Furthermore, we will review the current literature on the clinical presentation, diagnostic modalities, and treatment strategies for cervicofacial actinomycosis in the pediatric population (16), highlighting the need for increased awareness of this rare but potentially serious infection.

2. OBSERVATION

A 3-year-old boy, S.K., presented to our clinic with a one-month history of a left cervical swelling. His vaccination schedule was up-to-date, and he had no significant past medical history. One month prior to presentation, the patient experienced a one-week episode of fever and received Azithromycin. Immediately following the resolution of the fever, a painless swelling emerged on the left side of his neck, progressively increasing in size to 10 cm in diameter at the time of presentation.

Clinical examination revealed a hard, immobile, and non-tender mass fixed to deep structures in the left laterocervical region. The mass was approximately 10 cm in diameter. Associated satellite lymphadenopathy was noted (Figure 1). Examination of the oral cavity was normal, with no signs of dental caries or mucosal lesions. The remainder of the physical examination was unremarkable.

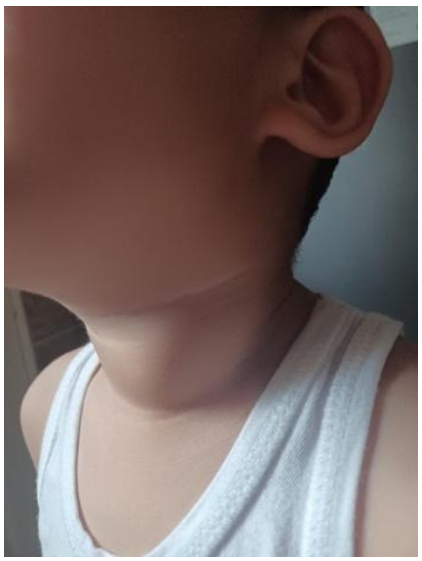

Figure 1. Lateral cervical mass.

Initial inflammatory markers were negative. A cervical computed tomography (CT) scan revealed a well-defined, heterogeneous laterocervical mass infiltrating the adjacent muscles, including the sternocleidomastoid muscle. Ultrasound imaging demonstrated dermohypodermal infiltration associated with the mass. An ultrasound-guided biopsy was performed, resulting in the drainage of purulent material.

Bacteriological analysis of the aspirated mass was negative for bacterial growth. However, histopathological examination of the biopsy specimen revealed findings consistent with actinomycosis of the soft tissues. These findings included a mixed inflammatory infiltrate with granulomatous features and the presence of characteristic actinomyces grains (Figure 2 and Figure 3).

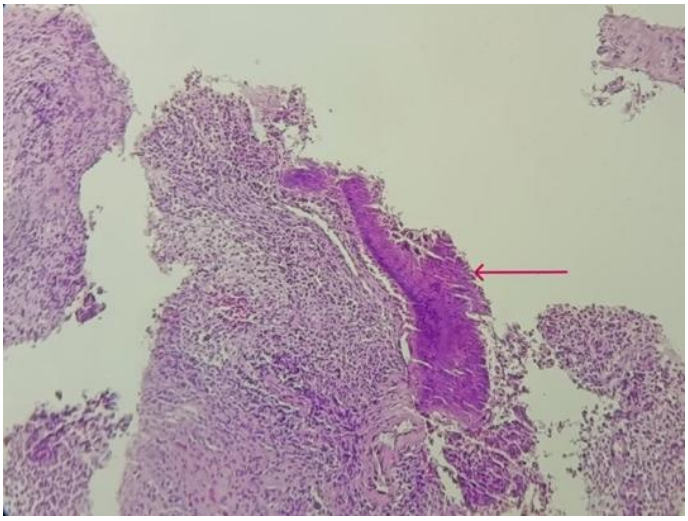

Figure 2. Basophilic colony of Actinomyces (arrow) surrounded by a mixed inflammatory infiltrate (microscopic examination) (Hematoxylin–Eosin staining, ×100).

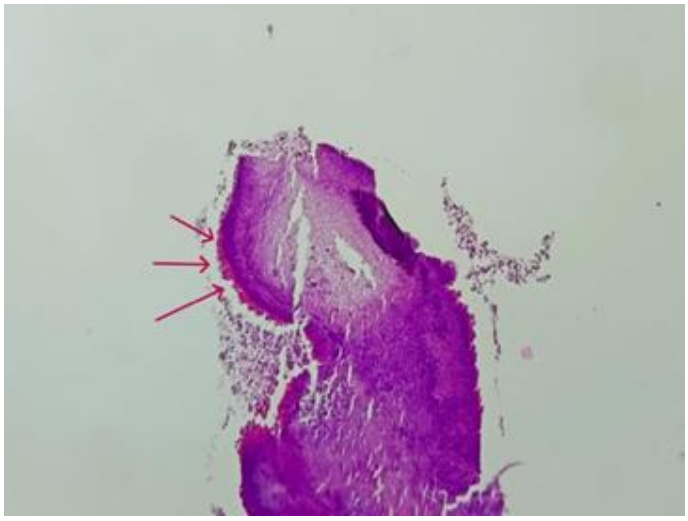

Figure 3. Eosinophilic rim surrounding a colony of Actinomyces corresponds to the 'Splendore-Hoeppli' phenomenon, which likely represents deposits of immune complexes and fibrin (Hematoxylin–Eosin staining, ×100)

Based on the histopathological diagnosis of actinomycosis, the patient was treated with intravenous ceftriaxone (100 mg/kg/day) for 21 days. Given a documented penicillin allergy, which justified the use of this alternative antibiotic regimen**.** This intravenous treatment was followed by oral antibiotic therapy, completing a total treatment duration of six weeks. This treatment regimen led to complete resolution of the cervical mass. The patient was followed clinically for three months after completion of the antibiotic therapy. A repeat CT scan at the 3-month mark revealed no signs of residual or recurrent disease. However, the three-month follow-up does not allow definitive confirmation of cure.

3. DISCUSSION

This case highlights the diagnostic challenges associated with cervicofacial actinomycosis in children, a rare condition that can mimic malignancy or other inflammatory processes. As illustrated by S.K.'s presentation, the lack of specific clinical features and the negative bacteriological analysis initially led to a misdiagnosis.

Cervicofacial actinomycosis is often underdiagnosed in pediatric patients due to its rarity and the nonspecific clinical presentation (7,8). While classically characterized by "lumpy jaw" syndrome (12), the presentation can vary widely, as seen in our case where the mass involved deep neck structures and mimicked a tumor (10). This diverse clinical picture, coupled with the frequent absence of classic sulfur granules in pediatric cases (11), makes timely recognition difficult.

The insidious onset and indolent progression of the disease, often spanning weeks to months before diagnosis, further complicate its recognition (3,13). In S.K.'s case, the mass had been present for a month before the correct diagnosis was reached, highlighting the potential for delayed diagnosis even when medical attention is sought. This emphasizes the importance of maintaining a high index of suspicion for actinomycosis in children presenting with persistent cervical swellings, particularly those with a history of preceding febrile illness.

Furthermore, this case underscores the challenges associated with isolating *Actinomyces* in culture, which is often hampered by the presence of co-infecting microorganisms and prior antibiotic exposure (3,13). While S.K.'s initial bacteriological analysis was negative, probably related to prior azithromycin therapy, the histopathological examination proved crucial in establishing the diagnosis. This finding aligns with previous studies demonstrating the importance of histopathology in confirming actinomycosis, especially when culture results are negative (14,17).

The successful treatment of S.K. with a six-week course of C3G emphasizes the effectiveness of antibiotics as the primary treatment for actinomycosis (6). The favorable response justified this approach under close clinical and radiological monitoring. While high-dose intravenous penicillin G is often considered the first-line therapy, other antibiotics, including third-generation cephalosporins like C3G, have proven effective, especially in children (1,18). However, due to the potential for relapse, prolonged antibiotic therapy for several months is generally recommended (11).

This case reinforces the importance of considering actinomycosis in the differential diagnosis of cervical masses in children. A high index of suspicion, careful clinical evaluation, appropriate imaging, and, crucially, histopathological examination are essential for timely and accurate diagnosis. Prompt initiation of antibiotic therapy, typically with a penicillin-based regimen, remains the cornerstone of treatment and offers a favorable prognosis for pediatric patients with cervicofacial actinomycosis. Finally, ensuring adherence to prolonged antibiotic regimens poses a significant challenge in managing pediatric actinomycosis (11).

4. CONCLUSION

This case of cervicofacial actinomycosis in a 3-year-old boy highlights the importance of considering this rare diagnosis in children presenting with atypical cervical masses, even in the absence of classic signs such as sinus tracts or positive cultures. The case underscores the value of histopathological examination in confirming actinomycosis, particularly when initial microbiological analysis is inconclusive. Prompt treatment with a third-generation cephalosporin led to complete resolution of the lesion, emphasizing the effectiveness of antibiotics in managing this condition. Clinicians should maintain a high index of suspicion for actinomycosis in children with persistent cervical swelling, particularly if preceded by febrile illness. Early diagnosis through a combination of clinical assessment, appropriate imaging, and histopathological examination is crucial to ensure timely intervention and a favorable outcome.

Ethical Declaration : Informed consent was obtained from the patient's legal guardians for the publication of this clinical case and associated data. All data have been strictly anonymized.

Competing interests: The authors declare that they have no competing interest.

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