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Scalp actinomycosis mimicking a soft tissue tumour: a rare case report

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Abstract

Actinomycosis is a chronic, suppurative infection caused by Actinomyces israelii, a Gram-positive, anaerobic bacterium commonly found in the oral cavity, gastrointestinal and reproductive tracts. Primary cutaneous actinomycosis is rare and often associated with trauma. We report a case of scalp actinomycosis in a 35-year-old man presenting with a firm, slowly enlarging mass initially suspected to be a soft tissue tumour. Radiological studies supported the clinical impression; however, histological analysis confirmed actinomycosis. The patient responded well to surgical excision and antibiotic therapy.

Key words: actinomycosis, scalp involvement, histopathology.

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Introduction

Actinomycosis is a rare, chronic granulomatous infection caused by *Actinomyces* species, with *Actinomyces israelii* being the most frequently implicated pathogen in human disease. These organisms are anaerobic, Gram-positive, filamentous bacilli that form part of the normal flora of the oral cavity, gastrointestinal tract, and female genital tract. Despite their commensal nature, they can become pathogenic following mucosal disruption due to trauma, surgical procedures, or underlying immunosuppression.[1]

The disease is most commonly classified into cervicofacial, thoracic, abdominal, and pelvic forms. Cutaneous actinomycosis is rare and usually secondary to direct extension or inoculation. Scalp involvement is extremely uncommon and can be mistaken for other conditions such as soft tissue tumours, tuberculosis, or fungal infections due to its nonspecific clinical appearance.[2-5]

Due to its slow progression and variable presentation, scalp actinomycosis may pose a diagnostic challenge. Radiological investigations are often non-specific, and a definitive diagnosis is usually achieved through histopathological examination. In this report, we present a rare case of primary scalp actinomycosis in an immunocompetent adult male, initially suspected to be a benign soft tissue tumour. The case underscores the importance of biopsy in chronic scalp swellings and highlights the role of combined surgical and medical management in achieving cure.

Case Report

A 35-year-old Fulani man was referred to the Plastic Surgery Unit with a 14-year history of right-sided scalp swelling. Initially the size of his distal phalanx, the swelling had remained stable for years but began to enlarge over the past years reaching approximately half the size of his clenched fist. He reported mild pain but denied systemic symptoms such as fever, weight loss, anorexia or malaise.

The patient was not diabetic, immunosuppressed, or on any long-term medications. Diabetes mellitus was ruled out by a normal fasting blood glucose level, and retroviral Human Immunodeficiency Virus (HIV) screening was negative, thereby excluding HIV-related immunosuppression There was no history of trauma, scalp injury, or previous surgeries apart from the earlier incision and drainage of an abscess at the same site seven years prior.

On examination, there was a solitary swelling in the right parieto-occipital region, measuring approximately 14×12×4 cm. It was firm to hard in consistency, not attached to the overlying skin, but fixed to the underlying skull. A solitary, enlarged right anterior cervical lymph node was also palpable.

A skull X-ray showed soft tissue swelling over the right parietal and occipital bones without bony erosion. A brain Computed Tomography (CT) scan revealed a soft tissue mass overlying the occipital region measuring 85×27×95 mm, with no evidence of bony involvement or intracranial extension. (Figure 1) Based on clinical and radiologic features, a diagnosis of benign soft tissue tumour was made, and excision biopsy was planned.

Intraoperatively, a firm, mixed-consistency mass was noted over the occipital and right parieto-temporal regions. A healed incision and drainage scar was observed at the summit of the mass, and an enlarged anterior cervical lymph node was excised. The lymph node was excised as the preoperative assessment suggested a neoplastic process, and the associated lymphadenopathy was not presumed to be reactive or expected to regress with antibiotic treatment.

Gross histological examination of the excised tissue revealed a partly skin covered scalp mass measuring 11×9×4 cm and weighing 240 g. Cut sections showed greyish-white tissue with microcystic spaces containing yellowish granular material. (Figure 2) The cervical lymph node measured 2×1.5×1 cm and appeared greyish-white on cut surface.

Microscopy revealed multiple suppurative granulomas composed of neutrophils, lymphocytes, plasma cells, macrophages, and foreign body-type giant cells surrounding basophilic sulfur granules, disposed within a fibrocollagenous stroma. (Figures 3 and 4) Grocott Methanamine Silver (GMS) staining demonstrated black filamentous organisms. Ziehl-Neelsen staining performed to rule out tuberculosis was negative. The cervical lymph node showed reactive lymphoid hyperplasia. A definitive diagnosis of actinomycosis was established. The patient was started on oral cefixime and discharged 12 days postoperatively. He was scheduled for outpatient follow-up and long-term antibiotic therapy with high dose penicillin.

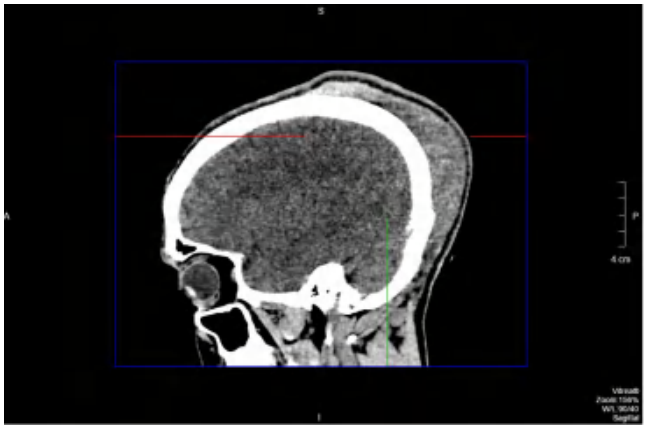

Figure 1. Sagittal view of brain Computed Tomography (CT) scan showing crescenteric hyperdense mass in the occipital region.

Figure 2. Gross specimen of a scalp mass that is partly covered with hair.

Discussion

Actinomycosis is a chronic bacterial infection that presents with a broad clinical spectrum depending on the anatomical site involved. It is caused by *Actinomyces* species - filamentous, Gram-positive bacilli that are part of the normal mucosal flora but can become invasive under favorable conditions.[1]

Cope's classification identifies three major forms of actinomycosis: cervicofacial (50%), thoracic (30%), and abdominal/pelvic (20%). Primary cutaneous or scalp involvement is extremely rare, with only a handful of cases reported in the literature.[3-5] Such pre-

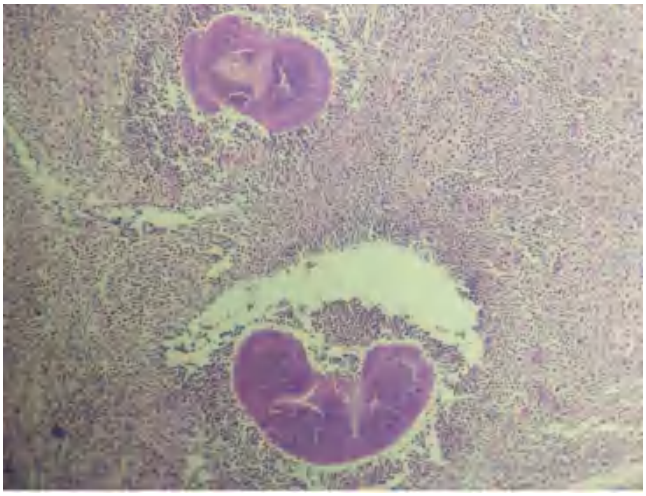

Figure 3. Photomicrograph showing sulphur granules (magnification x100).

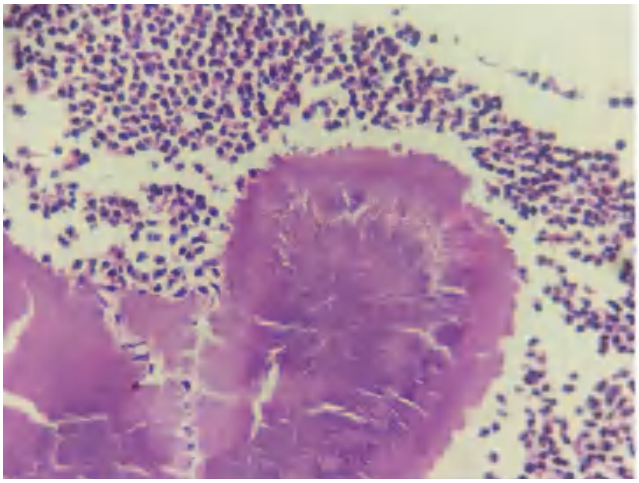

Figure 4. Photomicrograph showing sulphur granules surrounded by sheets of neutrophils (magnification x 400).

sentations are often misdiagnosed due to their slow growth, firm consistency, and ability to mimic benign or malignant tumours, fungal infections, or tuberculosis.

The classical features of cutaneous actinomycosis include indurated nodules, abscesses, and draining sinuses that may release sulfur granules.[4] However, in our case, the lesion presented as a slowly enlarging, non-tender scalp mass without systemic symptoms or discharging sinuses, further complicating the clinical impression.

Predisposing factors such as trauma, dental infection, or immunosuppression are often implicated in actinomycosis.[6] In our patient, no such risk factors were identified apart from a remote history of incision and drainage, which may have served as the portal of entry.

Imaging modalities such as CT and Magnetic Resonance Imaging (MRI) are useful in defining the extent and location of lesions but are generally non-specific.[4] The definitive diagnosis depends on histopathological identification of sulfur granules within suppurative granulomas.[7] Special stains, including Gram and GMS, highlight filamentous bacterial organisms, thereby distinguishing this lesion from eumycetoma, which is characterized by true fungal hyphae.[8,9] In addition, Ziehl-Neelsen staining is negative, reflecting the non–acid-fast nature of the organism and thereby excluding tuberculosis.[8] This was the key to diagnosis in our case.

Treatment of actinomycosis involves prolonged antibiotic therapy, typically with high-dose penicillin or amoxicillin.[4] The standard duration is 6-12 months; however, shorter courses may be considered when complete surgical excision has been achieved.[1] In our case, surgical removal of the infected tissue followed by oral cefixime resulted in good short-term outcomes, with plans for continued antibiotic coverage and follow-up with high dose penicillin.

Conclusions

Scalp actinomycosis is a rare and diagnostically challenging entity that may clinically and radiologically mimic neoplastic lesions. This case reinforces the importance of considering actinomycosis in the differential diagnosis of chronic scalp swellings, even in immunocompetent individuals. Histopathological examination remains the cornerstone of diagnosis, and early surgical intervention combined with appropriate antibiotics is key to successful treatment.

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