Actinomycosis of the mandible, possibly related to oral cavity or dental infection

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Section: Head & neck imaging
Area of Interest: Head and neck
Procedure: Diagnostic procedure
Imaging Technique: CT
Special Focus: Infection Case Type: Clinical Cases
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Patient: 19 years, female

Clinical History:

A young patient complained of pus discharge from a facial lump, which had developed insidiously at the left subcondylar region. She was afebrile and had no palpable neck lymph nodes. A right-sided perimandibular fistula with subsequent spontaneous closure was reported 8 years before, in the context of teeth extraction and ameloblastoma removal.

Imaging Findings:

The lateral cephalogram (Fig. 1) revealed severe mandibular hypoplasia and retrognathia with open bite. Computed Tomography (CT; Fig. 2) showed a left-sided ill-defined swelling of the parotid gland and sternocleidomastoid muscle, and confirmed an active fistulous tract extending to the adjacent skin. Local inflammatory changes involving the homolateral parotid space and small reactive regional adenopathies were associated findings. Masticator space abnormalities were mainly related to denervation atrophy of muscles. A localized inflammatory process and an inactive fistula track were detected in the right subcondylar region. Signs of mandibular chronic osteomyelitis were evident (Fig. 3), with massive bone destruction involving both condyles and ramus. Gram-positive organisms with filamentous branching were identified in the microscopic evaluation of the fistula drainage.

The patient received aggressive antibiotic therapy (clindamycin) over 6 months, nonetheless a left fistulectomy was required. After a 5-year disease-free period, a bilateral mandibular distraction with an intraoral bivectorial distractor was performed with excellent results (Fig. 4-5).

Discussion:

Cervicofacial actinomycosis occurs infrequently, but represents the most common site of involvement of this disease, accounting for 50% of cases [1, 2]. It generally affects immunocompromised patients and oral mucosa breakdown is the main risk factor, as a result of trauma, dental extraction or poor dental hygiene [1–3]. Oral endogenous Actinomyces species are the causative agents, with Actinomyces israelli being the most common pathogen implicated [1, 2, 4]. The perimandibular area is predominantly involved, but cheek, parotid gland, teeth and tongue are also common locations [1]. Cervicofacial actinomycosis primarily affects the soft-tissue. However, osteomyelitis of the underlying bone, though rare, may also occur by direct extension or haematogenous spread, and mainly affects the mandible [3]. Imaging findings are not specific, but are essential to evaluate local extent and to define treatment planning [1, 5]. The infection usually spreads contiguously, crossing fascial planes; nevertheless,
localized forms have also been described [4–6]. CT usually depicts an infiltrative soft-tissue mass with relative homogeneous contrast enhancement and surrounding inflammatory changes [5]. A central core of suppurative necrosis may be found in some cases, but large necrotic or cystic areas are rarely seen [1]. Abscess and spontaneous fistula formation generally occur in acute and sub-acute phases [2, 4, 5]. Osteomyelitis imaging findings also depend on the activity of the disease; areas of osteolysis are predominant in the acute phase, while sequester formation, predominance of sclerosis and periosteal reaction occur in chronic forms [3, 5]. Regional lymphadenopathies may occur later in 40% of cases [1, 5]. Nonetheless, lymphatic spread is not typical of this disease, in opposition to malignant tumours and chronic granulomatous infections (mainly tuberculosis and nocardiosis), which represent the main differential diagnosis. The diagnosis requires the identification of Actinomyces isolated from pathological specimens; these are Gram-positive bacteria that produce filamentous branching hyphae and form asexual spores. However, the high rate of false-negative cultures and the variable presence of sulphur granules, only identified in 35-55% of cases but highly specific for this disease, may pose a diagnostic problem [1, 2]. Early and prolonged antibiotic treatment is critical to preclude extensive local destruction, but resection of necrotic tissue, fistulectomy and abscess drainage may also be necessary [1, 5]. In conclusion, cervicofacial actinomycosis still remains a challenging disease and a high index of suspicion is necessary to provide an early diagnosis. Although soft-tissue involvement is the preferential manifestation of this disease, extensive bone involvement can also occur, as exemplified by this case.

**Differential Diagnosis List:** Actinomycosis of the mandible, Malignant neoplasm, Other chronic granulomatous infections: Tuberculosis, Nocardiosis, Coccidiomycosis

**Final Diagnosis:** Actinomycosis of the mandible

**References:**


Description: Left-sided sinus fistula at the subcondylar region (1B; arrow) and ill-defined swelling of parotid gland and sternocleidomastoid muscle. An inactive fistula track was also seen on the opposite side (1C; arrow). Origin: Fernandes L, Department of Radiology, Hospital Santa Maria, Lisbon, Portugal
Figure 2

Description: Chronic mandibular osteomyelitis (A-D) mainly affecting both ascendant ramus and condylus and causing temporomandibular joint destruction bilaterally (B, C). Delayed healing after right upper third molar extraction (air bubble;E) is also suspicious for osteomyelitis. Origin: Fernandes L, Department of Radiology, Hospital Santa Maria, Lisboa, Portugal
Description: The inactive fistulae tracts can still be depicted in both subcondylar regions (black and white arrows), but no associated inflammatory changes are noted in the adjacent tissues. Origin: Fernandes L, Department of Radiology, Hospital Santa Maria, Lisbon, Portugal
Description: The almost ideal jaw position was achieved at the end of the treatment, as demonstrated in the fixation period. Origin: Fernandes L, Department of Radiology, Hospital Santa Maria, Lisbon, Portugal
Description: Severe mandibular retrognathia with open bite was evident. Origin: Fernandes L, Department of Radiology, Hospital Santa Maria, Lisbon, Portugal.