Case Report

Actinomycosis of tongue: Rare presentation mimicking malignancy with literature review and imaging features

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Actinomycosis of the tongue is rare. It may be difficult to differentiate this infection clinically and radiologically from other tongue pathology especially neoplasia. We report a substantial tongue lesion which mimicked malignancy at presentation. The patient was treated successfully with 4 weeks of oral antibiotic therapy. It is also important that clinicians are aware of the radiological differential diagnosis of lingual actinomycosis.

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Case Report

A 60 year-old woman presented to the Maxillofacial Surgery Department with a gradual onset of painful swelling on the dorsum of her tongue. Patient was referred by otorharyngology Department with concern this was a possible malignancy. There was no history of trauma. Past medical history was also noncontributory. Oral examination revealed a firm and tender mass approximately 3 × 4 cm involving left side of the dorsum of tongue and floor of mouth. The mucosa was intact and tongue movements were unaffected. There was no cervical lymphadenopathy or signs of systemic infection. Nasopharyngoscopic examination did not reveal any synchronous lesion. Haematological examination revealed leucocytosis and raised C-reactive protein (CRP) level. Radiological investigations prior to biopsy included contrast-enhanced Magnetic Resonance imaging (MRI) of the oral cavity and the neck (Figs. 1 and 2) revealed a large heterogeneous lesion involving the left side of tongue and floor of mouth. Imaging findings were consistent with a possible neoplasm without significant adenopathy in the...
Fig. 1 – T1 (A) and T2 STIR (B) images show a large ill-defined lesion involving the entire tongue (large arrow). It is isointense to muscle on T1-weighted images and heterogeneous on T2-weighted images. There are small hypointense areas seen within the lesion (small arrow). The lesion crosses the midline and involved the left genioglossus muscle.

Fig. 2 – Postcontrast fat suppressed coronal (A) and sagittal (B) reveal moderate non-homogenous enhancement. The hypointense areas seen on precontrast imaging did not enhance on postcontrast scans. The involvement of the floor of mouth was better delineated after contrast administration (arrowheads).

Fig. 3 – Histopathological section (H&E Stain) showing polymorphonuclear leukocytic infiltration (arrow heads), dark staining Actinomyces colonies (asterix) and connective tissues in tongue (arrow).

Discussion

Actinomycosis is a chronic suppurative infection primarily caused by Gram-positive anaerobic bacterium, Actinomyces israelii. There are generally 2 forms of actinomycosis infection: acute and chronic. Acute form shows features including a sudden onset of the infection and multiple pus discharging sinuses containing sulphur granules. Our case can be considered as chronic, the other form, since there was a gradual onset of disease and the lesion only had induration and fibrosis but no suppuratation.

The most common sites are the cervicofacial region followed by abdomen and lungs [1]. Actinomycosis of the tongue is rare and represents only small percentage of the actinomycosis reported cases in English language literature. A few of those reported cases and their management are described as a brief summary in our report (Table 1). According to these findings, Actinomycosis of the tongue was mostly caused by local trauma but sometimes there was no obvious etiological factor.

The clinical manifestations of Actinomycosis may be confusing and mimic other disease processes. A detailed history is invaluable to determine whether it is an infective or a neoplastic pathology. The commonly reported presentation is pain, swelling and induration of the dorsum or lateral tongue. Direct spread of this infection into the adjacent tissues may cause osteomyelitis of the jaws [17] and facial disfigurement. Cervicofacial actinomycosis can also affect organs such as lung, heart, and brain through blood stream from infected tissue. Although disseminated actinomycosis is uncommon but if occurs it may lead to multiorgan failure and death if left untreated [18].

Lesions are diagnosed by a combination of histopathology and microbiological culture. Radiological investigations
include MRI, CT and/or Ultrasound ideally performed prior to biopsy. There are no unique radiologic features; therefore, correlation with clinical findings is important. Early diagnosis limits the spread of infection and associated morbidities [19] and avoids inappropriate surgery.

Radiologists should be familiar with the various clinical and radiologic characteristics of Actinomycosis. Kurtaran et al. (2011) reported Actinomycosis of the tongue as high-contrast enhancement mass on T1-weighted MRI image whereas a T2-weighted finding was a hyperintense mass [13]. Most of the described radiological features are not consistent with our MRI findings (Fig. 1) which emphasizes the variation in appearance depending upon amounts of inflammatory granulation and fibrous tissue within the lesion [20].

Actinomycosis can mimic a neoplasm but certain imaging features, especially on MRI, can help differentiate it from malignancy. The lesion is usually ill-defined and can be trans-spatial whereas neoplastic lesions are generally more well defined. The presence of low T2 signal with nonenhancing areas with the lesion represents Actinomycotic granules. Lack of significant neck adenopathy in the presence of a large lesion should prompt consideration of a nonmalignant differential diagnoses including abscess, vascular malformation, chronic granulomatous disease such as tuberculosis or syphilis (Table 2).

There is lack of high quality evidence supporting use a first-line antibiotic regimen. Successful resolution after 4-6 weeks of penicillin therapy, as in our case, was seen in most studies [21]. Clindamycin, macrolides, and doxycycline are alternative options [22,23]. The addition of metronidazole as adjunctive to a beta-lactamase inhibitor is of proven benefit with recurrent and polymicrobial Actinomycosis infections [24].

Cervicofacial actinomycosis has tendency to recur. Recurrent infections were seen mainly in patients who either

| Table 1 – Brief description of few reported cases of tongue actinomycosis. |
|-----------------------------|------------------|-------------------------------------------------|------------------|
| Author(s) year (ref)        | Age of diagnosis (years) | Sex              | Clinical findings                                                      | Treatment                          |
| Sodagar and Kohort 1972 [2] | 47               | Female           | Firm palpable mass right lateral border                                | Excision                            |
| Uhler and Dolan 1972 [3]    | 43               | Male             | Painful nodular mass right lateral border                               | Excision Penicillin for 6 months    |
| Kuepper and Harrigan 1979 [4] | 35            | Male             | Round firm tender mass left middle third                               | Penicillin for 1 month              |
| Brignall and Gilhooly 1989 [5] | 55            | Male             | Nonulcerated, indurated swelling anterolateral and ventral tongue surface | Penicillin for 2 months             |
| Islaska et al. 1991 [6]     | 64               | Female           | Painless swelling left dorsal surface                                  | Penicillin for 6 months             |
| Morris et al. 1992 [7]      | 50               | Male             | Nodular lesion anterior-dorsal surface                                 | Penicillin                          |
| Ficarra et al. 1993 [8]     | 57               | Female           | Nonulcerated, indurated mass right lateral aspect                      | Penicillin for 2 weeks              |
| Alamillos-Granados et al. 2000 [9] | 74        | Female           | Painless indurated ulcer involving ant floor of mouth, alveolar process and labial mucosa | Minocycline for 10 weeks (Allergic to Penicillin) |
| Atespare et al. 2006 [10]   | 52               | Female           | Solid painless mass left anterior tongue                               | Excision Penicillin for 3 weeks     |
| Enoz M 2006 [11]            | 39               | Female           | Nodular lesion anterior dorsal tongue                                   | Tetracycline for 6 weeks (Allergic to Penicillin) |
| Habibi et al. 2008 [12]     | 54               | Female           | Nonulcerated, non-tender mass right lateral border.                    | Excision Penicillin for 3 weeks     |
| Kurtaran et al. 2011 [13]   | 54               | Female           | Solid painful mass left tongue                                         | Excision Combination therapy of Amoxicillin–Clavulanic acid with Metronidazole for 5 weeks Local debridement |
| Rocha et al. 2017 [14]      | 44               | Female           | Necrotic tissue with purulent right lateral tongue developed after sclerosing agent injection to treat vascular lesion |                                                     |
| Jat et al. 2017 [15]        | 44               | Female           | Nonulcerated nodular mass dorsal surface                              | Excision. Doxycycline for 3 weeks (Allergic to Penicillin) |
| Aneja et al. 2017 [16]      | 14               | Male             | Nodular mass present on right lateral border                          | Excision Amoxicillin–Clavulanic acid for 2 weeks |
had insufficient duration or incomplete treatment with antibiotics. Our literature search did not reveal any case report describing local or distant recurrence of lingual actinomycosis after being treated successfully with antibiotics over a prolonged time. Huang et al. (2018) reported actinomycotic brain abscess which developed 15 months after 6 weeks of successful treatment of nasopharyngeal actinomycosis [25]. Long-term surveillance, therefore, is still necessary for patients suffering with actinomycosis in any particular area in cervicofacial region. Published reports reveal that patients have been monitored over variable period of time ranging from 1 to 5 years at different intervals. There exists as much difference in follow-up pattern and duration as there is variation in the organs affected by actinomycosis. Overall, there is lack of uniform strategy to follow these patients up once they have achieved clinical cure from actinomycosis. Based on the aforementioned recurrence of actinomycosis after 1 year in the brain initially treated for nasopharynx actinomycosis, we propose an annual combined clinical and radiologic follow-up for at least 2 years. Further research is needed to validate such suggestion and to set guidelines for continued surveillance in patients diagnosed with actinomycosis in head and neck region.

Conclusion

Actinomycosis of the tongue remains a diagnostic challenge. The correlation of clinical, radiological, and histopathological findings is important to establish the diagnosis and avoid inappropriate treatment. Long-term clinical and imaging follow-up is indicated because of the risk of relapse.

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Table 2 – Differential diagnosis table for tongue actinomycosis.

| Disease          | Radiological findings                                                                 |
|------------------|---------------------------------------------------------------------------------------|
| Lingual abscess  | CT: thick-rim enhancing fluid-attenuation lesions, MRI: T1 hypointense–T2 hyperintense lesion surrounded by a T1 hyperintense–T2 hypointense rim enhancing diffusely postcontrast |
| Squamous cell carcinoma | Contrast-enhanced CT: Moderately enhancing heterogenous mass lesion, MRI: Tend to be isointense to muscle on noncontrast T1WI heterogenous increased signal on T2WI, postcontrast enhancement in most cases |
| Vascular malformations | CT: Enhancing hypoaattenuating or heterogenous lesions, MRI: Isointense on T1WI but hyperintense on T2 WI. Usually heterogenous on contrast enhancement. |
| Tuberculosis     | CT: Areas of low attenuation and rim enhancement, MRI: Relatively homogeneous intermediate signal intensity on T1-weighted image. Heterogeneous high signal intensity mass on T2-weighted image. |
| Syphilis         | CT: Nonspecific, enlargement of the tongue, central necrosis of lesion, occasionally cystic changes, MRI: Nonspecific T1: variable enhancement; T2: high-signal intensities |

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