

Case Report

A rare case report on infratemporal, masticator and parapharyngeal space infection secondary to decayed upper wisdom tooth

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Abstract – Introduction: Space infections of infratemporal and temporal spaces are rare. These spaces rarely present as the primary space. An infection here could migrate to cavernous sinus through the pterygoid plexus or into the orbit through the valveless ophthalmic veins which has dangerous consequences. **Case report:** A 66-year-old male reported to the Department of oral and maxillofacial surgery with difficulty in mouth opening and pain in left temporal region. Patient was prescribed antibiotics and analgesics and recalled for extraction of upper left third molar under local anaesthesia once mouth opening improved. After 15 days, patient presented with generalized edema in relation to left side of the face. MRI revealed abscess in Left infratemporal spaces and edema of the left parotid, pharyngeal space and effusion of left temporomandibular joint. Incision and drainage along with extraction of upper left third molar was performed under general anaesthesia. **Conclusion:** Infratemporal space is a primary space involved in odontogenic infections and symptoms of this are hard to identify. If left untreated, it may spread to deeper spaces. Immediate intervention in the form of extraction of offending teeth and/or incision and drainage along with adequate intravenous antibiotics and analgesics will help the clinician to treat this condition.

Introduction

Deep neck space infections are still a frequent and challenging issue. Ludwig's angina is still the most prevalent deep neck space infection, followed by parotid, peritonsillar, and submandibular abscesses [1]. Involvement of infratemporal and temporal spaces as the primary space are still a rare occurrence. Infections of odontogenic origin are most commonly linked to maxillary molars [2]. Maxillary sinusitis, tonsillitis, maxillary sinus fracture, temporomandibular arthroscopy, drug infection, dental caries, and extraction of infected teeth are the main etiological factors of these infections [3].

Observation

A 66-year-old male patient complained of restricted mouth opening and pain in left temporal region for 1 week. Mouth opening was 12 mm due to which complete clinical examina-

tion could not be carried out. Patient had chronic generalized periodontitis and on using a dental explorer, proximal catch was present in upper left third molar tooth which suggested decay. Patient was referred to Department of Conservative dentistry and Endodontics to assess decay and vitality of the upper left molars. Systemic examination was carried out: there were no significant findings and the patient had no medical comorbidities.

Radiographic findings

Initial radiographic examination was done using OPG (Orthopantomogram) which revealed generalized bone loss and decay in upper left third molar. Cone beam computed tomography (CBCT) was advised and confirmed findings of carious upper left third molar as well as bilateral maxillary sinus mucosal thickening.

Extraction of upper left third molar was planned. Patient was advised antibiotics and analgesics and to follow up after improvement of mouth opening. However, patient did not follow up.

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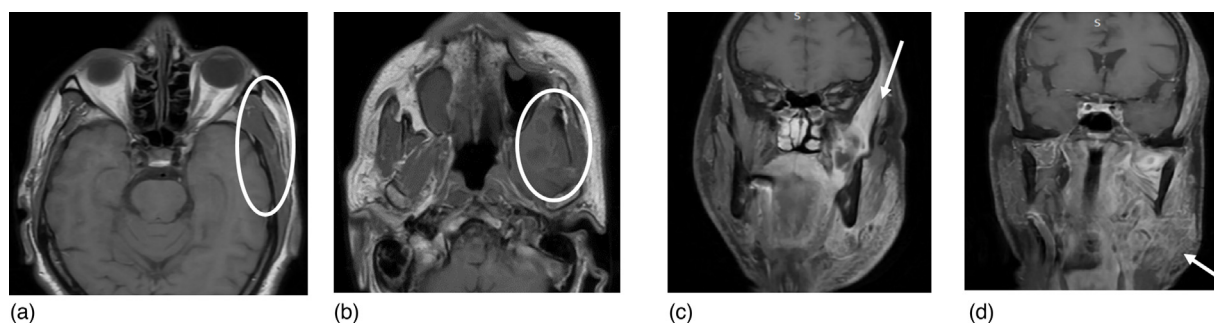


Fig. 1. MRI images of the abscess with oedema. (a and b) Axial sections. abscess is highlighted with the white circle. (c and d) Coronal section. The abscess is highlighted with the white arrow.

He later reported with the same complaint and restricted mouth opening with diffuse left facial edema after 15 days. He gave history of application of a paste containing clove inside the oral cavity in the upper left back tooth region. Following which, there was an exacerbated swelling process. Magnetic resonance imaging (MRI) was advised and it revealed an abscess in the left infratemporal fossa with ill-defined soft tissue edema of left masseter, left parapharyngeal and left retropharyngeal regions. Left submandibular gland and parotid gland also revealed evidence of edema (Figs. 1a, 1b, 1c, 1d)

Immediate intravenous antibiotics and analgesics were administered and the patient was planned for extraction of offending tooth, incision and drainage under general anaesthesia.

Surgical procedure

Under general anaesthesia, after thorough aseptic conditions were maintained, incision was given in left coronoid region in the maxillary vestibule. Through blunt dissection, left temporal, left infratemporal, left masseteric and left lateral pharyngeal space were approached and pus drainage was done. Extraction of upper left third molar was also done. ENT surgeon was called intraoperatively to evaluate the edema in the pharyngeal spaces. An incision was placed in the anterior faucial pillars region to relieve any edematous fluid present. Ryles tube was placed for administration of feeds. Patient was kept under observation in intensive care unit for 2 days after the operation due to the generalized edema present in the pharyngeal spaces. After recovery, patient was shifted to wards for further medical management.

Follow up

Heister's mouth opening device was given to the patient after discharge to improve mouth opening and patient was recalled on an OPD basis for regular oral hygiene maintenance. After 1 week of follow up, a vestibular swelling was noted in left lower buccal vestibule. Under local anaesthesia, a small incision was placed in the localised swelling region and pus drainage was done. Opening was kept patent and patient was on regular follow up.

After 15 days, mouth opening improved and no residual edema was present. By 1 month, mouth opening was 43 mm. Patient is currently undergoing treatment for dental rehabilitation.

Discussion

According to Peterson [4], there are two types of temporal spaces: superficial and deep. The superficial temporal space is continuous with the masseteric space inferiorly, and it extends superiorly to the pericranium, lateral to the temporalis muscle, and medial to the temporo-parietal fascia. The deep temporal space extends laterally to the temporal crest and superiorly to the point where the temporalis muscle attaches to the inferior temporal crest, lateral to the temporal bone, and deep to the muscle [4,5] (Fig. 2).

The presentation of infratemporal fossa infection can occur in one of three ways: (a) inside the fossa; (b) ascending into the temporal fossa; or (c) inferiorly into the parapharyngeal space [6].

Space infections involving infratemporal region is a rare but presents as a serious sequela of odontogenic infections. Odontogenic infections frequently involve the masticatory space, and pathways of spread typically carry infection through the deeper nasopharyngeal portion of the masticator space before involvement of the infratemporal fossa. As such, infratemporal fossa abscess represents a relatively advanced stage of odontogenic infection. Although the infratemporal fossa itself is accessible to clinical evaluation, the deeper portions of the masticator space are less well suited to physical examination. The trismus that often accompanies these infections further limits physical examination. As a result, infections in this area can be difficult to diagnose accurately. Knowledge of the relevant anatomy and typical pathways of spread for these infections can facilitate accurate diagnosis and treatment of these infections [7]. Depending on the particular anatomical characteristic causing the infection, several symptoms may be seen, such as discomfort, fever, trismus in cases of acute infection and trismus combined with edema in cases of chronic infection, as well as neurosensory impairment [8]. Trismus associated with odontogenic infections result from mechanical obstruction caused by swelling or

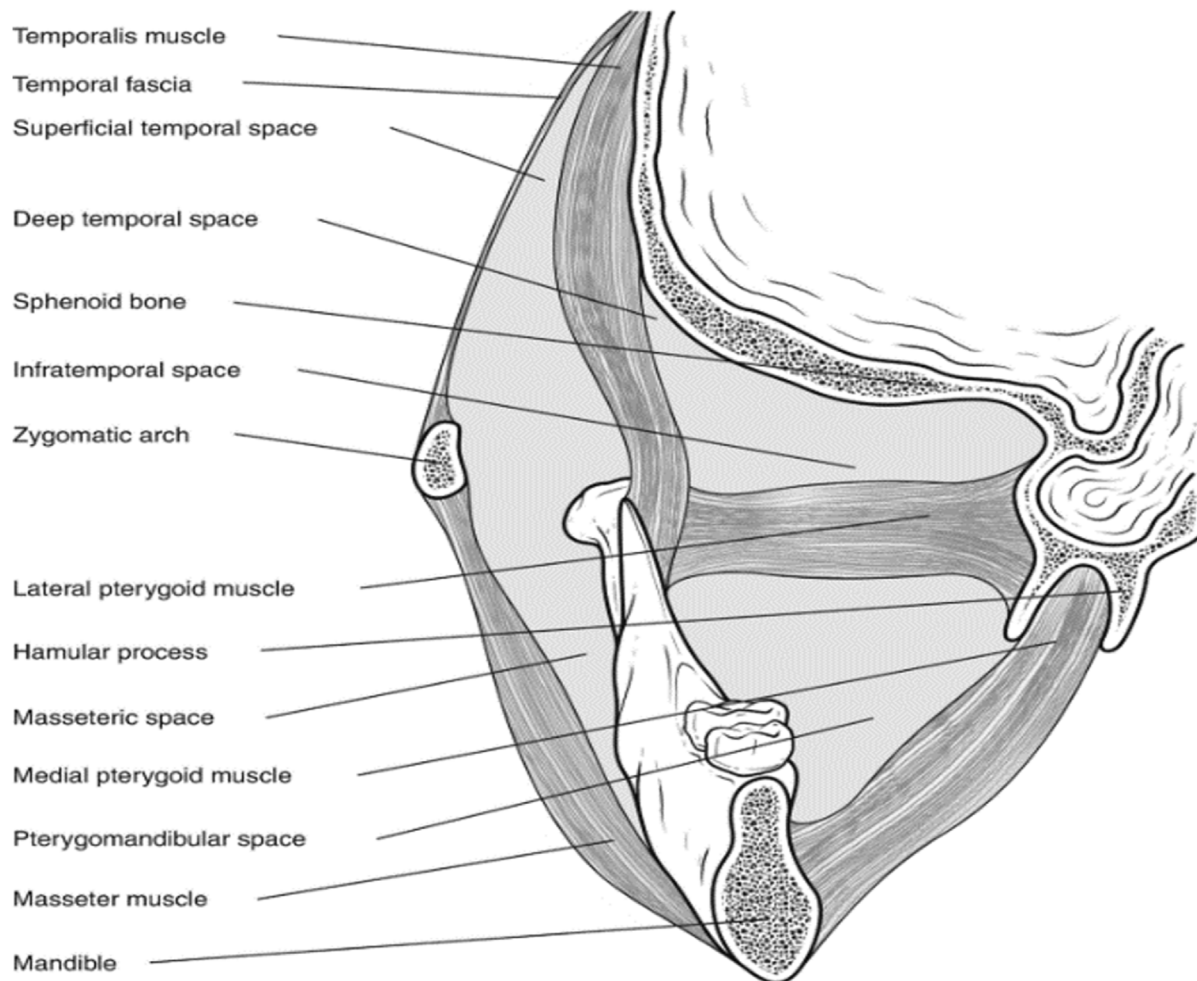


Fig. 2. Anatomic scheme showing the anatomic relations of the temporal space. Anterior view (the mandible is cut and some anatomic structures are not represented).

as a result of increased lactic acid production and exotoxins produced at local site leading to reflex spasm of the nearby muscles. When separating infratemporal area infection from other illnesses causing facial edema, trismus can serve as a crucial diagnostic marker [9].

There are multiple avenues for the spread of infection. Infections from maxillary sinus, which also forms the anterior border of the infratemporal fossa. Alveolar neurovascular bundles running through canals in this region can be a source of infectious spread. Another hypothesis is that there are several periosteal breakpoints through which infection can spread from the tooth to the maxilla and through the periosteum into nearby fascial spaces. Another theory is that trauma from dental procedures (such as nerve blocks) can cause microbial seeding in the infratemporal fossa and lead to further infections [10].

The infection might spread superiorly through the pterygoid plexus to the cavernous sinus or through the valveless ophthalmic veins into the orbit, which may result in intracranial and orbital complications. Infection may spread to other spaces or may be limited to infratemporal region only.

If the infection spreads inferiorly, pericarditis and mediastinitis may be a complication of the infratemporal abscess [11]. Hematogenous spread to brain or micro emboli to distant areas is also a possibility. None of the above complications was seen in our patient.

Isolated infections can present as a diagnostic dilemma as it may be diagnosed as joint or muscle disorders [9]. Recurrent episodes of trismus and tenderness over the infratemporal region over condyle may be confused as temporomandibular joint dysfunctions, myositis or parotitis which are possible differential diagnoses [8]. To arrive at a correct diagnosis, doctors should accurately undertake an intra- and extra-oral examination, considering past medical and dental history. Additionally, accurate data from imaging modalities, particularly MRI and CT scans, will enable more targeted and timely diagnosis and treatment.

In our case, we think that the odontogenic infection that travels through the periosteal breakpoints to the neighbouring facial spaces—which were next to the infratemporal space—followed by spread to parapharyngeal and masticator space, was the mechanism of infectious dissemination.

Definitive treatment of infratemporal abscesses usually requires antibiotic therapy as well as incision and drainage. In our patient, pus culture showed no growth and this was due to IV antibiotics.

Conclusion

Infratemporal space infection as the primary space due to odontogenic infection is rare. Thorough anamnesis and a clinical examination are crucial in assisting surgeons in reaching a precise diagnosis. Appropriate treatment is also necessary to avoid mortality and further spread of infection to deeper spaces.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics approval

Not Applicable; Case report presented keeping patient's details anonymous.

Informed consent

Informed consent obtained by the patient prior to surgical procedure.

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