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CASE STUDY

A RARE CASE OF MULTIPLE SPACE INFECTIONS INCLUDING TEMPORAL AND OCCIPITAL SPACE ! FIRST CASE TO REPORT

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ABSTRACT

Maxillofacial infection may range from low-grade, well localized infections to severe life threatening facial space infection. Oral and maxillofacial space infections have several etiologies such as odontogenic cause, surgical treatment, upper respiratory tract infection, penetrating trauma, and malignancies. Neglect of odontogenic infections can have serious consequences. The authors report a case of rapid progressive temporal and occipital space infection that originated from dental caries, which is a medical emergency. Early recognition and prompt treatment direct to the underlying sources of infection are crucial. Surgical incision and drainage and broad-spectrum intravenous antibiotics are the mainstay of treatment to reduce morbidity and mortality from this lethal condition. Management should be based on early diagnosis and immediate management with intravenous broad-spectrum antibiotics and surgical intervention.

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INTRODUCTION

The importance of the maxillofacial infections can be attributed to the high incidence and morbidity of such infections. Incorrect or late treatment generally leads to serious complications which could also be avoided by early and effective treatment, especially for the severe infections (Sato *et al*., 2009; Sánchez *et al*., 2011; Cunha *et al*., 2012). Occasionally, these infections become severe in a very short period of time and cause more serious complications. If the infection is not properlytreated, it may develop into an abscess. This abscess may track along the fascial planes deeper into the neck and head, potentially extend into the mediastinitis leading to life-threatening complications (Daramola *et al*., 2009). When the diagnosis of abscess is confirmed clinically or radiologically, immediate surgical drainage can prevent morbidityand mortality. Concurrent abscess in distinct neck spaceshas rarely been reported in healthy adults. Temporal and occipital space infections are very unusual cases and have not yet been reported in any of the literature (Songu *et al*., 2010).

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Here a rare case of temporal and occipital space infection, in a 50 years old male, is reported and the clinical presentation and the managementare discussed with a review of the literature.

Case report

A 50 year old patient came to our department with the chief complaint of difficulty in mouth opening and severe pain on the left side of the head region and pus discharge in the left lower back tooth region (Figure-1). Initially patient has undergone extraction of 37 under local anaesthesia and has been advised for incision and drainage after 3 days of antibiotic cover, after which patient didn't turned up for further management. After 20 days patient came back to the department with severe pain and swelling in relation to left side cheek region. Extraoral examination of the patient revealed restricted mouth opening (15mm) and diffuse swelling of 10 cm ×5cm present in relation to left side cheek involving the left temporal region which was tender on palpation. Intraoral examination of the patient revealed pus discharge from extraction socket of 37 region (Figure-2).

Figure 1. Profile picture with restricted mouth opening

Figure 2. Extra oral swelling

Patient was sent for orthopantamogram (OPG) which revealed bone resorption in relation to 37 region (Figure-3)

Figure 3. OPG reveals bone resorption in relation to 37

And CT scan maxilla and mandible which revealed spread of infection in temporal and occipital region.(Figure-4)

Figure 4. CT scan (axial section)

A general physical examination demonstrated that patient was Febrile (temperature-102^0F) and marked raised in total leukocyte count (13 thousand /mm^3). The diagnosis was made as multiple space infection and was planned for incision and drainage under general anaesthesia. Prior to the procedure a pus culture was taken from intraoral site which suggested of candida albicans. Under G.A markings were done on the most dependent site i.e.- left temporal region, left check and left sub mandibular region (Figure-5)

Figure 5. Incision markings in the most dependent area

Followed by stab incisions for drainage of pus (Figure-6).

Patient was kept under antibiotic for 1 week, during postoperative period patient was afebrile, mouth opening improved and total leukocytes count came to normallimit. (Figure-7,8)

Figure 6. Intra operative pictures of incission and drainage

Fig. 7.

Fig. 8.

Figure 7, 8. Post operative picture

DISCUSSION

Head and neck infections of odontogenic origins are routinely treated as an office procedure. Untreated or rapidly spreading odontogenic infections can be potentially life-threatening secondary to airway compromise or septicemia. In the literature, the submandibular space is the most commonly seen in multiple-space infections, followed by the lateral pharyngeal space, buccal space and submental space. Most organisms involved in infections of the headand neck are of odontogenic origin (Chow *et al*., 1978). Infections due to anaerobic and Gramnegativeorganisms have increased in comparisonwith past reports in medical and dental literature. This may be related to improvements in isolating and culturingmethods of anaerobic organisms. The temporal space can be divided into superficial and deep temporal spaces. The superficial tempo ral space extends superiorly to the pericranium, lateral to the temporalis muscle and medial to the temporoparietal fascia (galea). Inferiorly this space is continuous with the masseteric space. The deep temporal space extends superiorly to the attachment of the temporalis muscle to the inferior temporal crest, lateral to the temporal bone and deep to the temporalis muscle. Inferiorly this space is continuous with the infratemporal space (Peterson's Principles of Oral and Maxillofacial Surgery, 2012). The temporal space along with the infratemporal, masseteric and ptyerygomandibular spaces can be grouped together as the masticator space. The masticator space is defined by the superficial layer of the deep cervical fascia as it splits at the inferior border of the mandible. The lateral portion covers the masseter as it connects to the zygomatic arch and continues on to cover the temporalis muscle. The medial portion follows the medial pterygoid superiorly, then continues with the levatorvelipalatini fascia to the skull base (Schuknecht *et al*., 2008). Spaces adjacent to the masticator space are the parotid space posteriorly, the parapharyngeal space medially, and the submandibular and sublingual spaces inferiorly. (Yonetsu *et al*., 1998) In a review of 45 deep fascial space infections of odontogenic origin by Yonetsu *et al*. (1998) 38 were extensions of mandibular infections and seven were extensions of maxillary infections. Only 10 of the 38 mandibular infections (26%) involved the temporal spaces while 100% of the maxillary infections involved the temporal spaces.

In a review by Rega *et al* of 30 patients with masticator space abscesses derived from odontogenic infection, five patients were found to have five space involvement. Of these five patients only one was associated with a lower molar. The extension of infection into the masticator space has been observed to frequently extend superiorly against gravity however the pathway is poorly understood. A submasseteric pathway aided by mastication forces has been proposed. Antibiotic therapy for infection of odontogenic origin is commonly chosen empirically. This is possible due to the well characterized composition of the microbial flora involved. (Stefanopoulos and Kolokotronis, 2004) The bacteriology of such infections includes gram positive aerobic alpha-hemolytic streptococci, facultative anaerobes in the Streptococcus anginosus group, with strict anaerobic gram negative rods such as Prevotella, Porphyromonas and Fusobacterium species. Eikenellacorrodens is an aerobic gram negative rod involved in a minority of infections with a known resistance to Clindamycin. Beta-lactamase production in odontogenic infections has been demonstrated in anaerobic gram negative bacteria ranging from 13.3% to 38.5%. Penicillin and metronidazole used in combination adequately cover the microbial flora of odontogenic abscess as metronidazole makes up for penicillin's limited activity against the beta-lactamase producing gram negative anaerobic bacteria. (Schmitz, John P 2007) As with any space occupying abscess, the usual

treatment required is drainage and medical management with appropriate antibiotics and hydration as required. Often, cases will respond quickly to antibiotic therapy alone and in these cases formal drainage may not be required.

Conclusion

The general dental profession deals with abscessed teeth and regional infections all the time. Sometimes this infection can become so aggressive that it can be life threatening for the patient thus requiring prompt and aggressive management by the maxillofacial specialist. Cases such as this remind us how aggressive these infections can become and demonstrate how much of a difference antibiotics make in outcome. There may be a time in future where more resistant organisms create new challenges in management of odontogenic infections.

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