IN BRIEF

- Infective complications can develop and present following the extraction of clinically non-infected teeth
- Infratemporal fossa infection is a rare complication of dental extraction
- The cardinal clinical signs of maxillary and mandibular neurosensory deficit may not be immediately apparent
- The diagnosis, as in this case, can only be confirmed using scanning imaging modalities (CT or MRI)

Infratemporal and submasseteric infection following extraction of a non-infected maxillary third molar

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A case is described where an otherwise fit young female patient developed a large submasseteric abscess following the uneventful extraction of a non-infected maxillary third molar under local anaesthesia with intravenous sedation. This report highlights the difficulty of clinical diagnosis especially in the early stages of the infection. This case also demonstrates the imaging modalities used to confirm the diagnosis. It is likely that the infection in this case arose in an infratemporal fossa haematoma resulting from reactionary haemorrhage. Careful injection of local anaesthetic with aspiration may prevent this complication arising. This is the first reported case of a submasseteric abscess associated with the extraction of a clinically non-infected maxillary third molar.

Submasseteric abscess is an unusual complication of dental extraction.¹ The clinical signs of cheek tenderness and marked trismus are non-specific and can make the diagnosis difficult. The differential diagnosis may include parotitis, parotid gland tumours, masseteric hypertrophy and temporomandibular joint disorders.² Infection in the infratemporal fossa has been reported arising secondary to fracture of the maxillary antrum and from infection involving maxillary molars.³⁻⁴ We could not find any reports in the literature of infection in the infratemporal fossa arising following extraction of an uninfected upper third molar.

This case report highlights the difficulties in clinical diagnosis of submasseteric

abscess arising from infection in the infratemporal fossa. We hope this case report will alert practitioners to the possibility of this rare presentation and demonstrate the imaging modalities available to achieve diagnosis.

CASE REPORT

A 22-year-old Caucasian female patient was referred by the principal of a surgical dentistry practice to the Consultant in Oral Surgery at The School of Dentistry, Belfast in November 2001. She had her left maxillary third molar extracted by an associate specialist practitioner within the practice to prevent cheek biting 3 weeks previously. The extraction was recorded as 'a quite simple extraction under local anaesthesia and sedation'.

The referring practitioner reported that since the extraction she had 'severe problems in the upper left area, mainly around the temporomandibular joint'. She had since seen her own general dental practitioner who had prescribed two courses of antibiotics, which did not relieve her symptoms.

She reattended the original surgical dentistry practice 2 weeks following the extraction when she was seen by the prin-

cipal. Having noted tenderness in the left lateral pterygoid and masseter muscles, he prescribed temazepam and analgesics.

The pain continued to worsen and the patient was seen the following week by an emergency dentist on duty in her local hospital. He referred her to the regional oral and maxillofacial unit where a staff grade practitioner felt that the clinical picture was consistent with a temporomandibular joint effusion and associated muscle spasm. The patient was advised to continue taking analgesics and was prescribed a course of diazepam.

Her condition failed to improve and she reattended the surgical dentistry practice 3 weeks following the extraction. At this time the principal noted that the patient looked unwell, appeared hot and had not had any relief with a variety of different analgesics. He noted that she had marked trismus with an interincisal opening of less than 1 cm. She had been unable to eat or sleep due to the pain and her condition appeared to be deteriorating. The surgical dentistry practice principal immediately made an urgent referral to the Oral Surgery Consultant in The School of Dentistry.

She was seen by The Oral Surgery Consultant in The School of Dentistry later on

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the same day of referral. The patient was found to be penicillin allergic on review of her medical history. Prior to this episode she had been generally fit and healthy with no serious illness. She was a moderate smoker and a light social drinker. On presentation to The School of Dentistry the patient was taking diclofenac, diazepam, temazepam and paracetamol.

On examination the patient appeared pale and distressed and was unable to open her mouth. She was pyrexial with a temperature of 39.5 °C. Although there was no apparent swelling affecting the left side of her face, she was tender in the left submandibular region below the angle of the mandible. All the teeth on the left were positive to ethyl chloride vitality testing and none were tender to percussion. It was not possible to access or visualise the left maxillary third molar extraction socket due to the severe trismus. Radiographs, including a dental panoramic tomograph, reverse Towne's and an occipito-mental view did not reveal any abnormality associated with the left maxillary third molar extraction socket, maxillary antrum or the temporomandibular joint.

Arrangements were made to admit the patient for pain control, rehydration, intravenous antibiotic therapy and diagnostic imaging. A full blood count was performed on admission. This showed a slightly elevated neutrophil count of $8.28 \times 10^9 \text{ l}^{-1}$. In view of the patient's inability to eat and drink normally and the fact that she had taken frequent high doses of paracetamol-containing analgesics, blood was sent on admission for renal, hepatic function, coagulation and serum paracetamol. These tests revealed a slightly raised fibrinogen of 5.1 g l^{-1} , which was consistent with ongoing infection or inflammation.

Arrangements were made to perform an MRI scan to determine the site and extent of the infection. Whilst awaiting the MRI scan, on the day following admission, the patient developed paraesthesia affecting the maxillary and mandibular divisions of the left trigeminal nerve. At the same time, a swelling became apparent in the left cheek. It was felt that this was in keeping with compression from infection in the left infratemporal fossa. As the MRI scan was not immediately available and because the swelling had become apparent, an ultrasound scan of the left cheek was arranged. This showed a large submasseteric collection (Fig. 1). The patient was taken to theatre for exploration and drainage of the left submasseteric space.

At operation there did not appear to be any apparent focus for submasseteric

infection. The left maxillary third molar extraction socket was healing well and the left lower third molar was found to be completely unerupted with no signs of pericoronal inflammation. Approaching the left submasseteric space through a buccal incision in the mandibular third molar region, approximately 30 mls of pus was liberated.

Post-operative drainage of the left submasseteric space was facilitated by the placement through the open intra-oral wound of a Yeates tissue drain, retained with a black silk suture. The pus was sent to microbiology for culture and sensitivity. *S. intermedius* and mixed anaerobes were cultured. The *S. intermedius* was sensitive to penicillin, erythromycin, trimethoprim, chloramphenicol and tetracycline. The patient's condition improved to the point where the drain was removed and she was discharged home on the fourth post-operative day on oral antibiotic therapy.

The patient was reviewed in the out-patient clinic 3 days later when her condition had improved further. Her trismus was still marked with interincisal opening of only 13 mm. The sensory deficit was still present but had improved. The patient was shown how to improve her opening using tongue spatulas and arrangements were made for physiotherapy at her local hospital.

On review in the out-patient clinic 1 week later the patient remained well. Her

interincisal opening was 20 mm unassisted and 23 mm with assistance. The neurosensory deficit had greatly improved and she was able to identify light touch and differentiate between sharp and blunt stimuli. The swelling had by this review decreased significantly. A CT scan was however arranged to ascertain the presence of any residual infection in the area, as the patient continued to experience discomfort.

The CT scan was performed the following week and it demonstrated loss of fat planes within the masticator space (infratemporal fossa) as well as air in the left submasseteric space, which probably resulted from the drainage of the abscess (Fig. 2). Following the CT scan the patient was commenced on a 7 day course of oral clindamycin to eradicate any residual infection.

At out-patient review the following week the clinical improvement was maintained. Her interincisal opening had improved to 22 mm unassisted and 25 mm assisted. The neurosensory deficit had also improved. On review 1 month later the clinical improvement in mouth opening and trigeminal sensation continued.

DISCUSSION

This case highlights the difficulty in clinical diagnosis of this rare complication of a routine dental extraction. Our impression, given the time elapsed between the extraction and the development of symptoms, is that the patient may have had a

Fig. 1 Print showing ultrasound scan of patient's left cheek. Dark void evident between left masseter and mandible (both marked) represents the large submasseteric abscess cavity. The scale seen on the right of the print shows the depth of the scan from the skin surface in centimetres

Fig. 2 Print of CT scan showing loss of fat plane in left infratemporal fossa (arrowed). Note the normal fat plane evident on right side

reactionary haemorrhage associated with the pterygoid venous plexus. A haematoma thus developed within the infratemporal fossa and consequently remained hidden. The infratemporal haematoma presumably became infected and this led to infection tracking into the submasseteric space.

The subsequent CT scan clearly showed the extent of the infection and its effects on structures within the masticator space (infratemporal fossa and submasseteric space). We would have preferred to obtain

an MRI scan prior to surgery but the more readily available ultrasound scan clearly demonstrated the extent of the submasseteric abscess.

CT scanning can clearly differentiate between cellulitis and abscess formation in the infratemporal fossa. For this reason it is a most effective imaging modality in cases of infratemporal fossa infection.⁵

MRI scanning is also a most useful imaging modality in the diagnosis of infratemporal fossa pathology. In cases where neoplastic disease is suspected, MRI

scanning may be more useful as it shows perineural infiltration and intracranial extension better than CT.⁶

As a result of potential delay in diagnosis and definitive treatment, infection originating in the infratemporal fossa can spread upwards to the base of skull or downwards into the deep tissue spaces of the neck as well as the extension into the submasseteric space seen in this case.

The major clinical sign of infratemporal fossa involvement in this case was neurosensory deficit affecting the maxillary and mandibular divisions of the ipsilateral trigeminal nerve. We could only find one previous case reported in the literature of neurosensory deficit in a patient with an infratemporal fossa abscess.⁴ This previously reported case of infraorbital neurosensory deficit, unlike our patient, had a previous history of maxillary trauma with infection in the antrum itself as well as the infratemporal fossa.

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