

Endodontics in mandibular hypomobility

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Abstract

Reduced oral aperture (Microstomia) and mandibular hypo mobility/trismus are relatively common conditions that can be encountered in patients attending general dental practice, community dental practice and district general or dental teaching hospitals. All dental specialties may see patients with these conditions, and regardless of which environment or specialty, both patient and clinician may experience significant problems. The purpose of this case study is to review the development of problems encountered for patients and clinicians, and to identify options to treat or manage the conditions.

Keywords: Mandibular hypomobility, Microstomia, Non Odontogenic, Odontogenic, Trismus.

Introduction

Mandibular hypomobility

Acute mandibular hypomobility is most often related to mandibular/facial trauma or iatrogenic causes such as third molar extraction or intramuscular haematoma (eg from intramuscular administration of local anaesthetic solution during an inferior dental block).¹In most cases reduced mandibular opening arising from iatrogenic causes will be self-limiting and therefore of limited consequence with respect to long-term dental/oral management. Careful local anaesthetic delivery is the most effective way to avoid iatrogenically induced mandibular hypomobility. For cases where severe trauma has been the aetiologic factor, chronic mandibular hypomobility is more likely to be the resultant outcome. This may be further compounded by reduction in size of the oral aperture.

Chronic mandibular hypomobility may arise from a range of causes, including temporomandibular joint pathology²(in most cases self-limiting or of relatively short duration), direct trauma, surgery, or as an effect of local radiation treatment for neoplastic disease. It may arise from problems distant to the joint or muscles, including local infection, neoplasia, and other systemic diseases (eg connective tissue disorders such as lupus and scleroderma, or central nervous system disorders).^{2,3}Chronic reduction in oral opening is relatively uncommon in the general population but may be seen in a significant proportion of patients who have undergone treatment for an oral cancer by surgery, radiotherapy, chemoradiotherapy or combinations of these. The prevalence of post-radiotherapy mandibular hypomobility has been reported to vary between 5% and 38%.^{4,5}This wide prevalence range may be accounted for by the variation in study methods. The variable incidence of mandibular hypomobility within this patient cohort appears to depend on a number of factors. These include: the location of the tumour, the nature and extent of surgery, the field of tissue irradiated, use of combined surgery and adjunctive radiotherapy, and the level of mobilisation encouraged and performed by the patient in the period immediately following treatment. Similarly, individual

patient variation may have an effect, including advanced age, obesity, reduced tissue vascularity and other comorbidities, such as hypertension, diabetes and connective tissue diseases.

Case Report

A 26 years old male patient reported to the Department of Conservative Dentistry and Endodontics of Babu Banarasi Das College of Dental Sciences, Babu Banarasi Das University, Lucknow, with the chief complaint of sharp shooting pain in the lower left back region of jaw since two weeks.

The initial examination showed that the patient's maximum mouth opening was 16.5 mm (Fig. 1). Patient gave the history of Areca nut chewing since 10 years (8-10 times daily). On Intra Oral examination, presence of fibrotic bands on buccal mucosa bilaterally were seen and a grossly decayed tooth in the third quadrant (Fig. 2). Radiographic examination revealed radiolucency involving pulp for which the patient was advised Root Canal Treatment.



Fig. 1: Maximum mouth opening of 16.5 mm

History of Presenting Illness

1. Progressive inability to open the mouth (trismus) due to oral fibrosis and scarring
2. Oral pain and a burning sensation upon consumption of spicy food.
3. Increased salivation
4. Hearing loss
5. Dryness of the mouth
6. Nasal tonality to the voice
7. Dysphagia to solids (if the esophagus is involved)
8. Impaired mouth movements (eg, eating, whistling, blowing, sucking)

Treatment

The early diagnosis of caries and realistic treatment planning are essential when managing patients with reduced oral aperture or hypomobility. Following clinical and radiographic examination decisions have to be made; the fate of teeth with poor prognosis can be easy to decide; however, teeth with dubious prognosis can be somewhat more complicated. If the teeth are completely inaccessible, then arrangements need to be made for their early removal.



Fig. 2: Carious tooth and fibrotic bands visible on buccal mucosa

Occasionally the restoration of a distal surface of a tooth can be facilitated by the temporary retention of the adjacent tooth as it can provide support for the restoration or for the matrix band during condensation. Conversely, the restoration of the mesial surface of a tooth can be facilitated by the loss of a more anterior tooth, if the ultimate removal of the latter is intended. Following an initial examination, with experience, it may be possible to gauge a patients' future tolerance to treatment. However, for the majority of occasions it may be more advisable to attempt a simple line of treatment initially, and to gauge their response accordingly. This will facilitate the decision-making process for teeth with dubious prognosis, or prior to embarking on more complex periodontal, conservative or prosthodontic treatment.

Following an initial examination, with experience, it may be possible to gauge a patients' future tolerance to treatment. However, for the majority of occasions it may be more advisable to attempt a simple line of treatment initially, and to gauge their response accordingly. This will facilitate the decision-making process for teeth with dubious prognosis, or prior to embarking on more complex periodontal, conservative or prosthodontic treatment. Mandibular hypomobility will quite often limit the length of time treatment can be undertaken for a patient in a session; frequent breaks, moments of relaxation and the use of a mouth prop may reduce patient fatigue and prolong this a little. When undertaking periodontal or conservative treatment involving water coolant, adapting an appropriate suction technique is necessary. It may be possible to use a conventional wide-bore aspirator; however, use of smaller diameter or additional saliva ejectors or aspirators may be more appropriate. If the mandibular hypomobility is severe, it may not be possible to use suction at all, and treatment will need to be stopped and the patient instructed to expectorate/rinse. Conservative treatment in the presence of mild to moderate mandibular hypomobility will probably allow for a conventional or miniature child-sized handpiece with suitable short-shank burs, with careful manipulation. In the presence of severe hypomobility, access to proximal and occlusal lesions in posterior teeth may be approached through the buccal aspect of the tooth, adapting a technique described by Howarth, caries removal and condensation of the restorative material can be achieved.⁹In certain circumstances cavity preparation may be facilitated by use of a straight handpiece and straight bur.



Fig. 3: Root canal procedure using mouth prop

Discussion

Oral submucous fibrosis was first described by Schwartz as "atrophiaidiopathica (tropica) mucosae oris". It is generally characterized by hyalinization of connective tissue fibres of lamina propria due to up-regulation of lysyl oxidase activity. It leads to submucosal fibrosis along with inflammatory infiltration. There may be atrophy of epithelium in advanced cases. In subsequent stages, there is formation of thick fibrous bands leading to progressive

reduction in mouth opening. There are a combination of etiological factors for initiation and progression of OSMF. The factors involved can be local or systemic. The local factors include areca nut/betel quid (releasing alkaloids like acroline and arecaidine), capsaicin, tobacco, alcohol and spicy foods. Systemic factors include nutritional deficiency (iron and vitamin B-complex deficiency) and genetic predisposition. Recently, auto-immunity has been shown to play a role in progression of OSMF.

The clinical diagnosis of OSMF relies solely on the signs and symptoms. These include reduced mouth opening, difficulty in protrusion of tongue, recurrent aphthous stomatitis, burning sensation to spicy foods, reduced/absence of papilla on tongue and formation of thick vertical fibrous bands in the buccal mucosa. Histological confirmation by biopsy is usually not indicated as it may lead to formation of a scar tissue and further reduction in mouth opening. Due to reduced mouth opening, the patients often face the detrimental effects of poor oral hygiene. In the present case, it was very difficult to perform endodontic therapy. A Vazirani-Akinosi closed-mouth anesthesia was given, as conventional inferior alveolar nerve block anesthesia was difficult to administer. Rubber dam placement was not feasible and the endodontic instruments were tied with a dental floss. Because of reduced inter-incisal opening, the use of conventional standard sized instruments was not feasible. The stainless steel hand instruments were bent at D16 level. At this level, the part of file with the cutting edges joins with the shank of the file and it is a comparatively weak junction as compared with rest of the shank. Thus, the instruments were gently inserted into the canals. Fresh instruments were used at every change of instruments; and, caution was taken not to use the same instrument multiple number of times. Minimal filing with gentle force was done with each instrument to prevent its fracture. A dentin softening regimen consisting of alternate use of NaOCL, EDTA and Chlorhexidine was utilized during instrumentation of the canals.

Conclusion

Lengthy dental treatment sessions and wide opening of the mouth during such procedures can harm temporomandibular joints or worsen the TMD which is already present. Therefore, it is prudent to break treatment session into shorter appointments and also let the patient rest and relax the muscles during treatment to prevent iatrogenic damage to TMJs.⁷

Conflict of Interest: None.

References

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