Report

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Case report: a patient who had not removed her full lower denture for 54 years

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ABSTRACT

Background: A 71-year-old female presented with a left submandibular space abscess. This was found to be due to large accumulations of calculus on the lingual flanges of her lower denture ulcerating the floor of the mouth. She had not taken the prosthesis out since it was provided as an immediate denture after extractions 54 years previously. At presentation she could not take her denture out as the calculus locked the denture under lingual undercuts. The denture was sectioned in the midline to remove it and the submandibular abscess was drained via a neck incision.

Findings: Prior to removal the denture was remarkably stable and she had enjoyed a long period of problem free denture wearing and had had exceptional value from it. There was also surprisingly little mandibular alveolar bone resorption.

Conclusion: The case demonstrates what may happen if a lower denture is not taken out for over half a century. The calculus on the lingual flanges provided both stability and retention for the denture, and it appeared to have protected the ridge from resorption. While the calculus may have provided some surprising benefits to her lower denture it ultimately led to a serious infection.

CLINICAL PRESENTATION

A 71-year-old female was referred to the acute Oral and Maxillofacial Surgery Service of Tauranga Public Hospital with a history of a submandibular mass increasing rapidly in size over a five day period. She had a CT scan performed at the time of presentation and was stabilised with IV antibiotics and fluids. A dental history revealed was that she had undergone a full dental clearance at 17 years of age and was provided with immediate dentures. She recalled the dentist telling her not to take the lower denture out as it was 'screwed in'. Since that time she had never taken her lower denture out, but regularly removed her upper denture for cleaning.

Extra-oral examination revealed a large, fluctuant, golf ball sized swelling in the left submandibular space. Intra-orally a very large volume of calculus attached to the lingual flanges of the lower denture was noted. The calculus extended into the lingual undercuts of the mandible to the extent that the prosthesis could not be removed.

A clinical diagnosis of submandibular space infection secondary to a floor of mouth infection was made, and the patient consented to incision and drainage of the abscess and removal of the denture by sectioning.

MANAGEMENT

Under general anaesthetic a skin crease incision was made into the left neck below the level of the anticipated position of the marginal mandibular division of the facial nerve. Dissection beneath the platysma muscle in the submandibular space yielded over 10 mL of frank pus. The loculations of the infection were explored, broken up, and washed out before placing a surgical drain.

The denture was then removed by sectioning in the midline to allow medial movement of each side away from the lingual undercuts (Figure 1). Nothing could be found that related to the denture being screwed in place, although the extreme extent of calculus formation provided excellent retention and stability (Figure 2).

FINDINGS

The floor of the mouth was ulcerated, confirming the likely cause of the infection. There was a small degree of denture hyperplasia anteriorly associated with the ridge resorption. There was however very little denture hyperplasia elsewhere and the bone resorption was not excessive for the length of

Figure 1

Figure 2

time being edentulous. There was no candidiasis. The lower denture, other than the massive attachment of calculus, appeared to have lasted remarkably well.

DISCUSSION

Calcis is the Greek word for stones, the term calculus and calculate in their mathematical senses coming from using stones as an aid for counting. It was applied to mineralisation occurring within the body in the 1700s (Harper, n.d.).

Calculi formation within the human body is a well-recognised phenomenon, with dental, salivary, tonsillar and renal calculi formation being common. Intra-orally dental calculus and sialolithiasis (salivary calculi) are often seen.

Dental calculus, within the oral cavity is primarily formed from the calcium phosphate salts; brushite, octacalcium phosphate, magnesium-containing whitlockite, and carbonate-containing hydroxyapatite (Molokhia and Nixon 1984). The two most common areas for calculus formation are the buccal surfaces of the maxillary molars and the lingual surfaces of the mandibular incisors (Bahadure et al. 2012), although location and levels of formation are population specific and determined by factors such as oral hygiene habits, age, diet, access to professional care, diet, age, ethnic origin, and the use of some prescription medications (White 1997).

Dental calculus is formed by the mineralisation of the dental bacterial biofilm. Initially the components of calculus are attracted to tooth surfaces by a weak electrical charge as the calcium phosphate salts are electrically unstable. Following the initial layer further ions are attracted to form a haphazard layer of fossilised bacteria which together with the free calcium and phosphate ions develop a mechanical bond resulting in a hardened structure (Addy et al. 1980).

Salivary gland calculi are very common, accounting for 50% of all salivary gland pathology, and are most common in males aged 30-60 years. The formation of calculi within a salivary duct follow a different pattern to intra-oral calculus formation. Although the exact aetiology is unknown it is thought that an initial organic nidus in association with localised stasis of calcium rich saliva leads to formation. Eighty per cent of salivary gland calculi form in the submandibular gland, attributed to the salivary content having an higher concentration of calcium and phosphate and a higher mucous content (Leung et al. 1999). There are numerous cases in the literature describing removal of large calculi from both the gland and the duct.

We have been unable to find examples of a denture being left in situ for such an extreme length of time. However, cases of unusual and large dental calculus formations associated with foreign bodies are not unheard of. In a recent case an 11-year-old girl underwent surgery for the removal of a large sublingual mass from the floor of the mouth and laboratory analysis found it to have formed around an embedded root fragment (Bahadure et al. 2012).

This patient presented with a remarkable history. She admitted to thinking that it seemed unusual not to take her lower denture out, but she explained that "in those days you did what the doctor told you to do." The patient was content with her lower denture for over 50 years. Even until the acute presentation she never had pain or discomfort with her lower denture and found the fit and function excellent. She did agree to the destructive removal of the denture, accepting that she had had good value from it and it was time for new one. The calculus was resting on and displacing the floor of the mouth. This appeared, in part, to be transferring the occlusal load to the mylohyoid muscle and may be the reason why there was relatively little ridge resorption.

DEFINITIVE REHABILITATION

The patient made an uneventful recovery from the submandibular space infection. Considering she had enjoyed such good denture retention over a long period the patient was offered rehabilitation with implant-based overdentures. Due to financial constraints the patient elected to simply have the denture hyperplasia removed and a new set of full dentures made. She was referred to a clinical dental technician for this and more modern instruction on denture care.

CONCLUSION

The importance of giving clear post-operative instructions cannot be overstated. Emphasis should be placed on ensuring that patients fully understand rather than simply providing information. A recommended protocol would be a detailed discussion and written instructions before the day of the procedure; to reiterate this further on the day of the procedure; and to arrange follow up appointments in the days and weeks after. Discussions with other family members present could also be helpful.

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