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Immediate Denture & Stafne's Bone Cavity Utilization for Enhanced Function: A Case Report

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KEYWORDS Clinical, mandibular denture, anatomical	ABSTRACT: This clinical repor presented with bill together with the p	t describes the fabrication of a mand ateral Stafne's bone cavities. A revi rosthodontic management of the patie	libular denture for an elderly woman who new of this anatomical entity is presented ent.

Introduction

DeVan's golden statement says that "Perpetual preservation of what remains is more important than the meticulous replacement of what is missing" is still true, yet there are instances where complete extraction becomes unavoidable, leading to potential social, psychological, and aesthetic consequences for the patient.⁽¹⁾ Immediate dentures offer a solution by being created prior to tooth extraction, eliminating the period where patient remains edentulous. The effectiveness of this treatment modality relies on accurate indications and the meticulous implementation of clinical and laboratory procedures.

Cystic lesions represent a prevalent pathology in the jaw bones. In 1942, Edward C. Stafne was the first to describe Stafne Bone Cyst (SBC). These cavities, typically asymptomatic, are discovered during routine radiography beneath the inferior alveolar canal. They are situated distal to the third mandibular molar in the mandible and are inferiorly delimited by the mandibular border.⁽²⁾ Stafne's bone cavities typically range from 1 to 3 cm in diameter. Although relatively rare, with an incidence of 0.3%, Stafne's defects have been reported more frequently in men than in women, constituting 80-90% of all cases. The cavities are often filled with normal salivary gland tissue, but in some cases, the contents may include skeletal muscles, fibrous connective tissue, and adipose tissue. The diagnosis of this defect is incidental, since patients do not usually present clinical symptoms.⁽³⁾

Stafne bone cysts are categorized based on their contour and their relationship to the buccal cortical plate:

- Type I: The bottom of the concavity does not extend to the buccal cortical plate.
- Type II: It reaches the buccal cortical plate without causing expansion or distortion.
- Type III: Characterized by buccal expansion of the cortical plate.⁽⁴⁾

These concavities are further classified into three types based on their contents as determined by axial CT analysis:

- Type F: The concavity is filled exclusively with fat density.
- Type S: Filled with a density of soft tissue structures, indicating the presence of lymph nodes, vessels, connective tissue, or other components.
- Type G: The submandibular gland is either entrapped within the concavity or positioned closely to it.⁽⁴⁾

Case Report

A 102-year-old male patient reported to the department of Prosthodontics for oral rehabilitation. On intra-oral examination, the patient had partially edentulous maxillary arch with generalised gingival recession with generalised grade II mobility and completely edentulous

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mandibular arch were observed. Teeth present were 13,14,15,21,22,23,25 (Fig. I,II). Palpation of lingual surfaces of mandibular arch revealed bilateral concavities in the premolar-molar region. Orthopantomogram was advised to the patient (Fig. III) which revealed generalised bone loss in relation to remaining teeth indicating need for extraction. The radiograph also showed asymptomatic defect in mandible corresponding to the concavities. After clinical examination and radiographic evaluation, it was concluded that the patient had Stafne's cavity which could be utilised for retention and stability of mandibular denture, thus a conventional immediate denture was planned.

Procedure

Maxillary and mandibular primary impressions were made in alginate and impression compound respectively and poured in dental stone and dental plaster. On the primary casts obtained, custom trays were fabricated for Campagne's⁽⁵⁾ impression technique for maxillary arch, and selective pressure^(6,7) impression technique for mandibular arch taking care that autopolymerising resin material did not engage into the concavities in mandibular arch.

Border moulding was done using low fusing green stick compound, light body addition silicone was used to make final impression in maxillary arch for edentulous area and putty consistency addition silicone was used as a pick-up impression material (Fig. IV). During border moulding of mandibular arch, green stick was slightly pushed in the region of concavities and final impressions were made using Zinc Oxide Eugenol impression paste (Fig. V). Master casts were obtained (Fig. VI) on which record bases and occlusal rims were fabricated. The region of Stafne cavity was blocked to ensure easy retrieval of record base.

Jaw relation was recorded and then transferred to Hanau Wide-Vue semi adjustable articulator with the help of Springbow-facebow. Posterior teeth arrangement was done and maxillary 11 was arranged to confirm aesthetics, labial fullness, size and shape of teeth along with mandibular teeth arrangement. Try-in was done to obtain satisfactory results.

The cast modification was done by technique given by Jerbi⁽⁸⁾:

- 1. Rule of thirds- Labial aspect of ridge was divided into three equal bands of space between gingival line of teeth and depth of vestibule (Fig. VII).
- 2. Teeth were cut up to the respective gingival line.
- 3. In the region of teeth, casts were trimmed to approximately 1 mm to simulate complete extraction of entire tooth.
- 4. Flat reduction was done starting at the trimmed labial depth to middle of gingival and middle third of the ridge.
- 5. Next step of ridge reduction was done beginning at labio-lingual centre (representing crest of ridge) and extending to the midwidth point of previous cut, thus contouring labial surface of the ridge.
- 6. Lingually, the cast area representing gingival roll was completely rolled away, except in the incisive papilla region.
- 7. Lastly, shaping and smoothening of the trimmed cast was done to achieve smooth intaglio surface of final denture in the regions of extraction.

Jerbi's technique for cast trimming was done first in 1st quadrant and teeth arrangement was done taking anterior teeth of adjacent side as reference for labial inclination and arch form. Following this, complete arch modification was done repeating the same procedure and teeth arrangement was completed (Fig. VIII).

This modified maxillary cast was used to fabricate a surgical stent⁽⁹⁾ with the help of clear self-curing acrylic resin to act as a guide during surgical procedure. Flasking and curing was done followed by finishing and polishing of the dentures.

On the day of insertion, all the remaining natural teeth were extracted and alveoloplasty was performed according to the prepared surgical stent (Fig. IX). Tissues were approximated with continuous sutures (3-0 silk suture) on both sides. Mandibular denture was relined with soft liner⁽¹⁰⁾ to incorporate the Stafne's bone cavity (Fig. X) and after trimming excess liner, polished dentures were inserted into the patient's mouth (Fig. XI).

Patient was advised to wear the denture overnight and recall was done after 24 hours. Patient complained of ulceration in maxillary anterior region and the required trimming was done. Patient was advised to continue wearing denture and called for suture removal after a week.

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Fig. I: Pre-op Maxillary arch



Fig. II: Pre-op Mandibular arch



Fig. III: OPG

Fig. IV: Maxillary final impression



Fig. V: Mandibular final impression



Fig. VII: Cast with markings



Fig. VI: Master Casts



Fig. VIII: Cast post modification

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Fig. IX: Intraoral surgical stent placement



Fig. X: Maxillary and mandibular denture intaglio surface



Fig. XI: Pre-op and Post-op frontal view of patient

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Discussion

An immediate denture is inserted on the day natural teeth are extracted. Immediate dentures offer numerous benefits, including enhanced patient acceptance, elimination of a period without teeth in the oral cavity, uninterrupted digestive function, preservation of the patient's overall appearance, reduced resorption of residual ridges due to early functionality, control of hemorrhage and the provision of a protective covering over the wound⁽¹¹⁾. As a result, immediate dentures enable patients to engage socially, enhance aesthetics, and maintain proper phonetics.

Stafne's bone cavities may not be visually diagnosed during intra-oral examinations due to the filling of these cavities with salivary gland tissue. It is evident that a comprehensive manual examination of all denture border areas is crucial during the initial examination appointment. These Stafne's cavities are more frequently encountered in the posterior region of the mandible (posterior variant). However, they can also manifest in the anterior region (anterior variant) and the ascending ramus of the mandible (mandibular ramus variant).

The prevailing understanding of the pathogenesis of Stafne bone cyst is the "glandular" hypothesis. According to this hypothesis, a hyperplastic or hypertrophic lobe of the submandibular, sublingual, or parotid salivary gland applies pressure on the lingual or buccal cortex of the mandibular body or ramus, leading to focal bony resorption and the formation of a bone cavity.⁽¹²⁾

The utilization of Stafne's defects to enhance the retention of mandibular dentures has been well-documented. Clinical reports recommend the use of heat-cure acrylic engaging into these cavities, as they are typically lined with unattached mucosa. Incidents of ulceration with the prosthesis in use are rare. In cases where patients report sore spots during the wearing and removal of the prosthesis, a permanent or temporary soft liner can be applied. Additionally, it is advisable for the soft liner to be thicker in the region of these cavities.⁽²⁾

Conclusion

Even in the age of implant and immediate implant treatments, it remains crucial to recognize immediate complete denture treatment as a significant therapeutic approach. A thorough extraoral and intraoral assessment, coupled with accurate treatment planning, will contribute to the successful replacement of missing structures with immediate dentures, meeting the functional needs and acceptance of the patient. At the same time, creating dentures by incorporating bilateral cavities enhances the retention and stability of the mandibular denture, thereby improving overall outcome of the treatment.

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