IMPLANT PLACEMENT IN ORAL SUBMUCOUS FIBROSIS (OSMF) AND TRISMUS PATIENTS WITH RESTRICTED MOUTH OPENING

Original Article

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ABSTRACT

Oral Submucous Fibrosis (OSMF) presents unique challenges in dental implantology, primarily due to progressive fibrotic changes limiting mouth opening. This abstract explores implant placement complexities in OSMF, focusing on innovative strategies for individuals with a restricted oral aperture. The document reviews current literature, emphasizing both surgical and prosthetic considerations.

Creative precision in treatment planning is pivotal, requiring a meticulous assessment of factors such as mouth restriction, tissue elasticity, and overall oral health. Addressing these challenges involves key tools like minimally invasive techniques, computer-assisted implant placement, and customized prosthodontic solutions. Emphasis is placed on a multidisciplinary approach, stressing collaboration among oral surgeons, prosthodontists, and healthcare providers for optimal outcomes.

Through amalgamating evidence-based practices with ingenuity, this abstract underscores the evolving landscape of OSMF implantology, paving the way for refined protocols and improved patient quality of life. In grappling with the unique challenges of OSMF, this exploration serves as a guide for clinicians, pushing beyond conventional boundaries, and inspiring a new era in implant placement for those with restricted mouth opening. Ultimately, it contributes to an enhanced standard of patient care within the dental community.

Key Words: oral submucous fibrosis, dental implants, trismus, oral cancer, radiotherapy .

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INTRODUCTION:

Oral Submucous Fibrosis (OSF) unfolds as a persistent oral affliction triggered by the habitual consumption of betel nut. The onset is marked by the emergence of vesicles within the oral cavity, initiating a cascade of inflammatory responses adjacent to the epithelium. This inflammatory process induces a gradual rigidity in the oral mucosa, culminating in trismus, a condition characterized by restricted mouth opening, and presenting challenges in the act of eating.[1]

Individuals with moderate-to-severe Oral Submucous Fibrosis (OSF) commonly express a significant concern regarding the restriction of oral aperture, a substantial obstacle hindering the seamless application of prosthetic interventions.

Over time, various innovative rehabilitation methods have been scrutinized in the continuous effort to address the challenge presented by limited oral access in individuals affected by Oral Submucous Fibrosis (OSF). These inventive approaches include surgical interventions utilizing strategic splints, the incorporation of dynamic mouth opening devices, the utilization of Mouth Exercising Devices (MEDs), and the investigation of magnetic attachments. Additionally, inventive modifications extend to the domain of denture design, aiming to surpass the limitations of traditional approaches.

The creation of an exceptional prosthesis necessitates a comprehensive understanding of oral tissues and meticulous documentation of relevant anatomical landmarks. Consequently, achieving a diagnostic impression with utmost precision becomes imperative in the pursuit of formulating an optimal prosthetic solution. Acquiring a diagnostic cast is a crucial prerequisite in the development of tailored trays and ultimate impressions. A seamlessly tailored prosthesis not only improves the aesthetics and functionality for individuals dealing with OSF but also significantly contributes to their overall well-being. This gratifying outcome serves as a cornerstone in the fulfilling journey for a prosthodontist.

In situations where interocclusal space is limited, implant specialists have an array of options to optimize the available room for implant placement. However, these alternatives may inadvertently prolong or introduce complexities to the treatment process. Specifically, surgical reconstruction involves a more invasive healing process and potential complications, contributing to increase in both cost and time requirements.[2]

CASE REPORT:

Case 1:

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An edentulous patient presented to the Department of Oral and Maxillofacial Surgery with chief complaints of restricted mouth opening, indicative of Grade III Oral Submucous Fibrosis (OSMF) as per figure-1 categorization, with mouth opening of 25mm (fig-2) . The patient's medical history revealed a past occurrence of tongue cancer, necessitating partial glossectomy ten years prior. Postoperatively, the patient underwent subsequent radiotherapy. To address the edentulism, six implants (Adin+CSM) were surgically placed in both upper and lower jaws. However, two of these implants failed, resulting in the subsequent placement of a fixed prosthesis supported by the remaining successful implants (fig3:). A final OPG was done which is depicted in (fig 4).

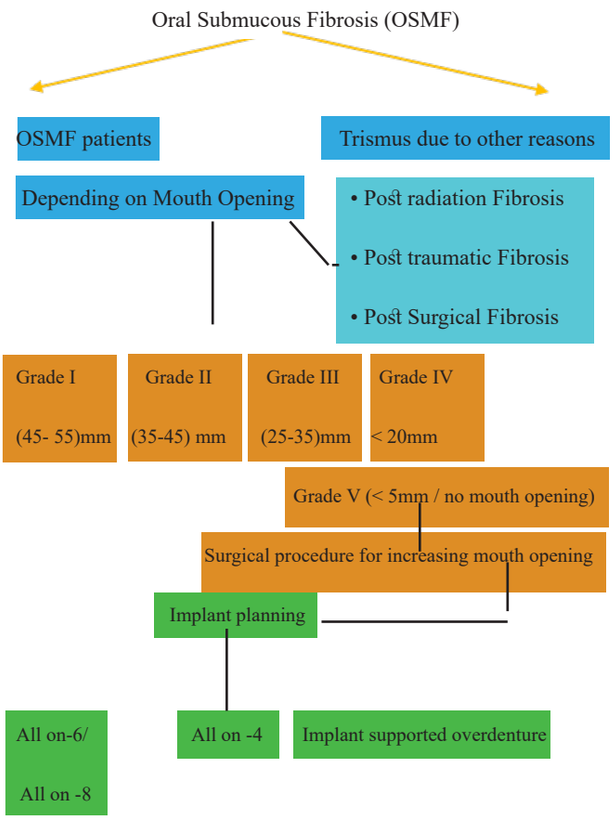

Figure 1: Flowchart depicting classification according to the mouth opening for implant planning

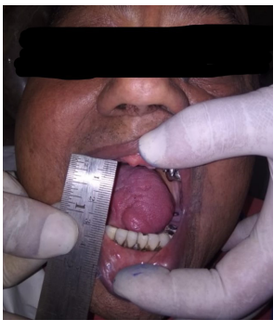

Figure 2

Figure 3

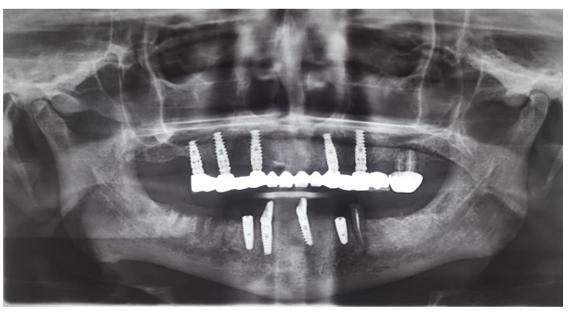

Figure 4

Case 2:

A fully edentulous patient sought evaluation at the Department of Oral and Maxillofacial Surgery, presenting with a primary concern of restricted mouth opening, indicative of Grade IV Oral Submucous Fibrosis (OSMF) based on Chart-1 classification with mouth opening of 20 mm (fig 5). A comprehensive medical history revealed a previous occurrence of squamous cell cancer of tongue a decade earlier, followed by subsequent partial glossectomy and radiotherapy postoperatively. To address the edentulous condition, a total of nine Osstem implants were strategically placed—three in the upper jaw and six in the lower jaw. Subsequently, a meticulously customized fixed prosthesis was successfully cemented in the patient's oral cavity (post opt fig 6:) following which a final OPG was taken which is presented in (fig 7).

Figure 5

Figure 6

Figure 7

Case 3:

A completely edentulous patient presented for evaluation at the Department of Oral and Maxillofacial Surgery, expressing the primary complaint of restricted mouth opening, aligning with Grade III Oral Submucous Fibrosis (OSMF) in accordance with figure-1 classification with mouth opening of 33 mm (fig 8). The patient's comprehensive medical history disclosed a concurrent diagnosis of severe parkinsonism, accompanied by laxity in the oral musculature. Addressing the edentulous state involved the judicious placement of multiple implants [Nobel+ Norris+ Osstem] in both jaws, paving the way for the subsequent affixation of a fixed prosthesis (fig9:).and a final OPG that was taken has been presented with the case(fig 10:).

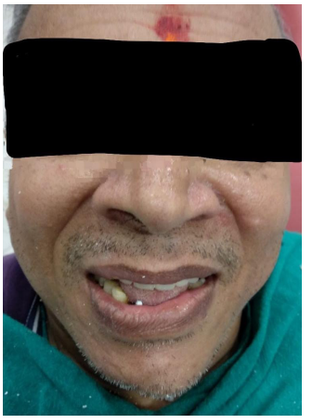

Figure 8

Figure 9

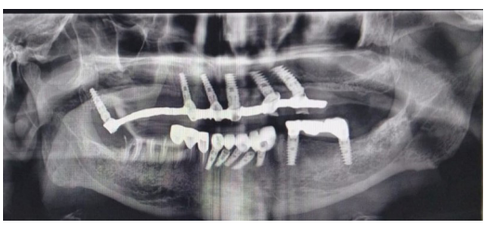

Figure 10

Figure 11

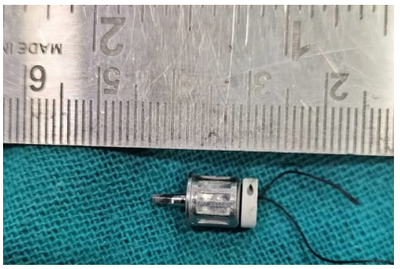

Figure 12

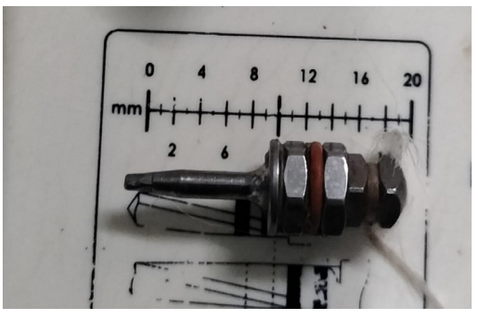

Figure 13

The cases presented underscore the intricate challenges and diverse approaches in managing edentulous patients with Oral Submucous Fibrosis (OSMF). The varying severity of OSMF, coupled with complicating factors such as a history of tongue cancer, radiotherapy, and coexisting severe parkinsonism, requires a comprehensive and tailored treatment strategy.

In Case 1, the initial phase involved assessing the accessibility and illumination within the oral cavity, crucial factors in evaluating the patient's oral health. To further enhance the diagnostic process, X-ray studies, including Cone Beam Computed Tomography (CBCT), were employed to assess bone availability for implant placement. This thorough assessment was imperative in planning the surgical placement of six implants (Adin+CSM) in both the upper and lower jaws. Due to the reduced mouth opening, a special tray was meticulously crafted using a rigid rubber base impression material, such as addition silicone, ensuring precision in capturing the oral impression. Failure of accurate impression of posterior areas with this technique prompted us to use an intra oral scanner for impression. The decision on the number of implants was influenced by the available accessibility within the restricted oral aperture.

In Case 2, a comprehensive diagnostic evaluation was carried out, taking into consideration accessibility, illumination, and the use of X-ray studies, particularly CBCT, to assess bone availability for the strategic placement of nine Osstem implants. The reduced mouth opening posed a challenge, necessitating the creation of a special tray using rigid rubber base impression material to ensure accurate impressions. The decision on the number of implants was intricately tied to the accessibility factors within the oral cavity. For the Grade IV OSMF case, a cemented prosthesis was employed, aligning with the treatment protocol. In Case 3, the comprehensive evaluation included an assessment of accessibility and illumination, crucial aspects in planning treatment for a patient with Grade III OSMF and severe parkinsonism. The utilization of X-ray studies, particularly CBCT, facilitated a detailed analysis of bone availability for implant placement. Given the reduced mouth opening, a specially crafted tray using rigid rubber base impression material was employed for accurate impressions. The decision on the number of implants was intricately linked to the accessibility factors within the oral cavity. The choice of a cemented prosthesis was determined by the Grade II OSMF severity and the overall treatment plan.

The incorporation of accessibility, illumination, X-ray studies, special trays for reduced mouth opening, and considerations for the number of implants into the case narratives emphasizes the meticulous and comprehensive approach taken in managing edentulous patients with varying degrees of OSMF. The treatment decisions were intricately tailored to the unique challenges posed by each case, reflecting a patient-centered and adaptive approach in prosthodontic care.

Individuals with moderate-to-severe Oral Submucous Fibrosis (OSF) commonly express a significant concern regarding the restriction of oral aperture, a substantial obstacle hindering the seamless application of prosthetic intervention . There were several experiments conducted that showed various successful methods of prosthetic rehabilitation in oral submucous fibrosis patients these are: Sectional denture, Need-based treatment approach :Use of small stock trays; medium-body elastomeric impression material, Oral screen prosthesis , Primary impression: single-stage peripheral tracing was accomplished with putty vinyl polysiloxane impression material and Secondary impression: light-body vinyl polysiloxane impression material; Sectional denture , Sectional impression tray technique , Sectional custom tray, Silicon putty material, Flexible impression tray techniques , Sectional splint , Surgery accompanied by the use of dentures to increase the vestibular depth, Sectional and hinged complete dentures , Conventional dentures were modified by relining with permanent silicone soft liner material , Sectional prosthesis with magnetic attachments, Mouth-exercising device.[3]

Protocols for Oral Submucous Fibrosis (OSMF):
While conducting the arduous procedure of implant placement in OSMF patients, the following protocols we improvised, should be followed. In addressing the diverse challenges posed by varying grades of Oral Submucous Fibrosis (OSMF), distinct protocols are outlined to guide the implant treatment strategies for each grade:

Grade I:
• Normal implant patients.
• Consider All on-6 implant system or All on-8 system.
• Options for both screwable and cemented prosthesis.
• Use of intraoral scanner(fig 11) or impression with stock tray and addition silicone rubber base material.

Grade II:
• All on-6 or All on-4 implant systems.
• Choices between screwable and cemented prosthesis.
• Use of intraoral scanner or impression with stock tray and addition silicone rubber base material.

Grade III:
• All on-4 or All on-5 implant system.
• Preferably opt for cemented prosthesis.
• Use of short length drivers for abutment fixation(fig 12) and ultra short length drivers (fig 13).
• Use of intraoral scanner or impression with custom tray and addition silicone rubber base material.

Grade IV:
• All on-4 implant system.
• Consider Implant-supported overdenture if tolerated by the patient.
• Options for cemented prosthesis.
• Use of short length drivers for abutment fixation.
• Use of intraoral scanner .

Grade V:
• Refer for mouth opening surgeries, such as bilateral fibrotomy, flap reconstruction, bilateral nasolabial, buccal pad fat, and other flaps.
• After achieving adequate mouth opening, reconsideration for implant placement is recommended, contingent on mouth opening progress.

These cases collectively highlight the importance of a multidisciplinary approach in managing edentulous patients with OSMF. Each case required a unique treatment strategy, integrating surgical expertise, prosthodontic precision, and considerations for systemic conditions. The role of implantology is prominent in such cases, but the potential for complications reinforces the need for careful patient selection and ongoing monitoring. Furthermore, the success of fixed prostheses in restoring both function and aesthetics demonstrates the positive impact of tailored rehabilitation in enhancing the overall quality of life for individuals grappling with OSMF and trismus. The cases underscore the dynamic nature of prosthodontic care, requiring adaptability, interdisciplinary collaboration, and a patient-centered focus for optimal outcomes.

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CONFLICT OF INTEREST

This clinical study was self-funded by the authors, with no conflict of interest.

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