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Microstomia- A Review Of Published Case Reports On The Proposed Management Of Microstomia

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Abstract
Introdcution*: microstomia, or the reduction of oral opening, can indeed present challenges for patients across various contexts, from eating and speech to prosthetic treatment. It's essential for clinicians to understand the underlying causes and tailor their approach accordingly. By synthesizing existing evidence, this review aims to provide insights into the effectiveness and feasibility of different prosthetic interventions, thereby guiding clinicians in their decision-making process for optimal patient care.*
Materials and methods*: published case reports and case series reporting on prosthetic rehabilitation of microstomia patients were included in the present review. Only cases with a reduction in the size of the oral aperture were included, and cases with reduced mouth opening with a normal oral aperture (e.g., oral submucous fibrosis, temporal-mandibular joint ankylosis, etc.) Were excluded.*
Case reports*: (case report1) a 93-year-old woman without teeth was referred from the local hospital to the department of oral rehabilitation at the faculty of dentistry, university of otago, dunedin, new zealand. The woman's surgeries on her lower lip resulted in a significant reduction in the vertical opening distance between her upper and lower lips, now at 30 mm. This condition, known as microstomia. (case report 2) a 62-year-old male patient, completely without teeth, presented to the prosthodontic department due to functional difficulties.*
Discussion*: a planned and step-by-step approach is crucial when dealing with cases of microstomia. The outcome greatly depends on the complexity of the case and the utilization of recommended materials and equipment hence, diagnosis and treatment planning play pivotal roles in the management process.*
Conclusion*: although the utilization of flexible denture materials holds promise in enhancing patient comfort and treatment outcomes, further research is warranted to evaluate their long-term success rates. Longitudinal studies can furnish valuable insights into the durability, stability, and overall performance of these materials over time, assisting clinicians in decision-making and optimizing patient care.*

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I. Introduction

Microstomia, or the reduction of oral opening, can indeed present challenges for patients across various contexts, from eating and speech to prosthetic treatment. It's essential for clinicians to understand the underlying causes and tailor their approach accordingly. Depending on the severity and cause of microstomia, conventional methods for dental prosthetics may not be feasible, necessitating modified approaches. In cases where microstomia is a result of burns, trauma, surgical interventions, or genetic disorders like Freeman–Sheldon syndrome or Burton skeletal dysplasia, the clinician must adapt treatment strategies to accommodate the limited oral aperture. This may involve specialized techniques for impression-taking and denture fabrication. For instance, using sectional impressions or removable denture segments that can be inserted and removed with greater ease can be beneficial. The consequences of microstomia extend beyond cosmetic concerns, affecting essential functions like speech, swallowing, and oral hygiene maintenance. Moreover, it can complicate medical interventions like endotracheal intubation and increase the risk of aspiration. Traditional prosthetic techniques used for edentulous patients may not be suitable for those with microstomia due to the unique anatomical limitations they face. Consequently, there's uncertainty among practitioners regarding the ideal prosthetic approach for these patients. To address this gap, a systematic review of published case reports and case series has been undertaken to evaluate the various prosthetic techniques and appliances employed in the oral rehabilitation of microstomia patients. By synthesizing existing evidence, this review aims to provide insights into the effectiveness and feasibility of different prosthetic interventions, thereby guiding clinicians in their decision-making process for optimal patient care.

II. Materials And Methods

Published case reports and case series reporting on prosthetic rehabilitation of microstomia patients were included in the present review. Only cases with a reduction in the size of the oral aperture were included, and cases with reduced mouth opening with a normal oral aperture (e.g., oral submucous fibrosis, temporal-mandibular joint ankylosis, etc.) were excluded. Reviews, commentaries, clinical trials, basic research articles and letters to the editors were excluded from the present review.

III. Case Reort

Case Report 1

A 93-year-old woman without teeth was referred from the local hospital to the Department of Oral Rehabilitation at the Faculty of Dentistry, University of Otago, Dunedin, New Zealand. Her upper denture was lost in the hospital while she was undergoing surgery for a squamous cell carcinoma of the lip. Over a period of 8 years, she had three surgical interventions on the lower lip, with the most recent one being within 3 weeks, requiring a wedge excision when the specimen was removed from the left side. The woman's surgeries on her lower lip resulted in a significant reduction in the vertical opening distance between her upper and lower lips, now at 30 mm. This condition, known as microstomia, made it impossible to insert her current mandibular denture into her mouth comfortably, and she faced difficulty with oral function without a prosthesis. During an extraoral examination, slight facial asymmetry was noted, including a deviation of the nose to the left, redness, and slight swelling in the center of her lower lip region. An intraoral examination revealed specific findings: the maxillary ridge appeared large and broad with reasonable sulcus depth, while the mandibular ridge showed extensive resorption with small amounts of flabby tissue both labially and in the posterior third. Additionally, the mucosa at the right corner of the lower lip was tender. Further analysis using panoramic and lateral cephalometric radiographs indicated that the mandibular bone quality was graded as least desirable (Class IV), whereas the maxillary ridge was deemed most desirable (Type A quality). Due to these oral conditions, the patient's diet was restricted to soft foods. Conventional methods for crafting complete dentures were deemed impractical for this patient's situation. The available prosthetic options narrowed down to sectional and/or collapsible denture techniques. However, these approaches are time-consuming, and considering the patient's age, there was a preference for a swifter solution. The proposed treatment plan comprised two phases, aiming for a less invasive clinical approach with expedited technical procedures. Phase 1 involved crafting a maxillary denture using a truly flexible material called ClearSplint acrylic (Astron, Lake Zurich, IL, USA). This material is amine-free, ensuring it remains clear without yellowing. Its expected lifespan ranges from 3 to 5 years, as per the manufacturer's specifications. Curing methods recommended include the press pack method in a water bath or the pour/fluid resin method in a pressure pot, with temperatures reaching 127°F. ClearSplint is a hybrid acrylic that can be repaired using chemically cured resin, beneficial if the prosthesis loses teeth. Cleaning should avoid alcohol-based products. In a 2009 test report conducted at the Medical Device Testing GmbH physical-chemical laboratory in Ochsenhausen, Germany, the flexible acrylic material demonstrated an average flexural strength of 13.4 MPa and a flexural modulus averaging 353 MPa. The material's great flexibility ensures it does not easily fracture under strain. ClearSplint acrylic has previously been used for temporomandibular splint prostheses due to its total flexibility. It can be made smaller for insertion and quickly regains its shape afterward. Initially, the plan was to trial the maxillary denture for a week before proceeding with the fabrication of a flexible mandibular denture. However, due to the strain the initial appointments posed on the elderly patient, the treatment plan was adjusted. In Phase 2, an alternate approach involved employing a copy denture technique for the mandibular denture. This method entailed modifying the existing denture, creating a wash impression, and then duplicating it, thereby minimizing appointments to just two for Phase 2 completion.

(C) Maxillary denture base made from a flexible amine-free resin (Clear Splint). (D) Maxillary denture after being placed in 40C warm water for 30 seconds, which allows it to become flexible.

Case Report 2

A 62-year-old male patient, completely without teeth, presented to the prosthodontic department due to functional difficulties. Upon examination, it was observed that he had a reduced oral opening, with an interridge distance of 20 mm and an intercommissural width of 32 mm. The patient's buccal and labial tissues were inelastic due to scarring and fibrosis resulting from previous surgery around the mouth corner. Additionally, the patient had type 2 diabetes mellitus and was managing it with oral hypoglycemic drugs. Despite these challenges, he displayed adequate manual dexterity and psychological well-being. Based on the Prosthodontic Diagnostic Index assessment, he fell into class IV, and according to the severity of his microstomia, he was classified as DM-3. After considering various options, it was decided to proceed with the fabrication of a sectional collapsible complete denture. The primary impression for the maxilla was taken in three sections. Firstly, separate impressions of the right and left ridges were made using impression compound. These impressions were trimmed approximately 4-5 mm from the midline, and irregular notches were created at the mesial surface. The mandibular impression was taken as a single piece using impression compound. Sectional custom trays were then crafted from the preliminary cast, featuring a stepped butt joint along the midline. Border molding was conducted using green stick impression compound, with separate trays for the maxilla and mandible. Following border molding, definitive impressions of both segments were simultaneously recorded using medium body polyvinylsiloxane (PVS), along with an index over the two segments for tray stabilization. The final record base for the maxilla was created in two segments (anterior and posterior) using Nature-Cryl® HI-20ET material. A custom-made Co-Cr hinge was incorporated into the midline of the posterior segment, allowing for collapsibility in the horizontal plane. The anterior segment was then placed over the posterior segment for stability and bracing. Similarly, a mandibular record base was fabricated in one piece with a custom-made Co-Cr hinge anterolingually in the midline, enabling collapsibility in the horizontal plane. Maxillomandibular relationship in centric relation was recorded using sectional resin base with wax rims and transferred to the articulator. Semianatomic artificial teeth were arranged in bilateral balanced occlusion. Two ball attachments were integrated into the posterior segment of the maxillary denture base to retain the anterior segment. Parallel paths of insertion on both sides were ensured using a dental surveyor. Two ball abutment housings were incorporated into the tissue surface of the anterior denture segment using autopolymerized acrylic resin. The collapsible-hinged mandibular complete denture utilized the resistance provided by the slopes of the residual ridges and tongue pressure for stabilization. Upon denture insertion, overextended borders and sharp edges were relieved from the intaglio surface. Occlusion adjustments were made to achieve equilibration in both static and functional mandibular positions. The patient received instructions and training for denture assembly and removal, along with post-insertion guidance on hygiene, safe storage, and maintenance.

IV. Discussion

A planned and step-by-step approach is crucial when dealing with cases of microstomia. The outcome greatly depends on the complexity of the case and the utilization of recommended materials and equipment; hence, diagnosis and treatment planning play pivotal roles in the management process. In consideration of various factors such as the patient's motivation for treatment, oral hygiene, extent of tissue loss, economic status, and available treatment duration, a sectional complete denture prosthesis was provided. The primary impression was taken using impression compound with carved indexing in the center to facilitate extraoral assembly, enabling a staged process to overcome limited access while maintaining the accuracy of the anatomical record. Additionally, the impression compound used for the primary impression also serves as a flexible impression tray, allowing for retakes and improvements if necessary. A final impression was then made using PVS medium body material to ensure increased accuracy, dimensional stability, and elastic recovery. This technique involved fabricating a sectional maxillary denture (both anterior and posterior segments) and incorporating a CoCr hinge in the center and ball abutments at the periphery of the posterior segment.

(A) Reduced oral access, 20 mm height and 32 mm intercommissural width.
(B) Custom made mandibular hinge.

This allowed for a two-part insertion and enhanced stability through the engagement of ball abutments and the central hinge. It's important to note that the success of the provided prosthodontic treatment is multifactorial. Improvement in mouth opening, soft and hard tissue health, cessation of harmful habits, maintaining good oral hygiene, and regular maintenance of the prosthesis are all critical for a positive treatment prognosis. Given the multifaceted nature of managing microstomia, a comprehensive classification system is essential for executing a holistic management plan. Despite the challenges, it's believed that microstomia management will become more convenient and efficient in the current era of digital development. Technologies such as intraoral scanning, computer-aided design and manufacturing (CAD-CAM), and 3D rapid prototyping can be leveraged to produce precise sectional dentures. This digital workflow can replace the hassle of manual impression recording, dental cast replication, and design processes. Furthermore, the use of dental implant-supported fixed prostheses can further improve oral function and patient satisfaction. By integrating dental implants into the treatment plan, patients with microstomia can benefit from increased stability and functionality, enhancing their overall quality of life. Overall, advancements in digital dentistry offer promising solutions for managing microstomia, providing more accurate and efficient treatment options for patients.

V. Conclusion

Utilizing flexible complete denture material offers a compelling option for patients grappling with challenges like microstomia, scarring, and toughened tissue around the lips due to surgical interventions such as squamous cell carcinoma treatment. These conditions often render conventional dentures uncomfortable or impractical. The advantages of flexible denture materials lie in their capacity to conform to the unique contours of the oral cavity, ensuring a comfortable fit even in scenarios where traditional rigid materials might provoke discomfort or pose difficulties. Their combination of strength, lightness, and tissue adaptability renders them especially suitable for such cases, substantially enhancing the patient's quality of life. Establishing a reliable insertion technique is pivotal for both the clinician and the patient. A technique that can be swiftly and easily managed not only reduces chair time but also minimizes trauma to the patient, particularly when the lips are tender or sensitive. Although the utilization of flexible denture materials holds promise in enhancing patient comfort and treatment outcomes, further research is warranted to evaluate their long-term success rates. Longitudinal studies can furnish valuable insights into the durability, stability, and overall performance of these materials over time, assisting clinicians in decision-making and optimizing patient care.

References

[1] Management Of Edentulous Microstomia Patient: A Case Report And Classification System: Maria S. Abbas, Volume 2022, Article Id 2686983, 5 Pages, 2; Published 1 February 2022

[2] Patil S, Sarode Sc, Sarode Gs, Bhandi S, Awan Kh, Ferrari M. Prosthetic Rehabilitation Of Oral Submucous Fibrosis Patients: A Systematic Review Of Published Case Reports And Case Series. 2017;12:E0184041. 2. Kirchheimer S, Sainuddin S, Bojanic S, Saeed Nr.

[3] Simultaneous Custom-Made Replacement Of The Temporomandibular Joint And Cranioplasty. Br J Oral Maxillofac Surg 2013;51:E70-E71.

[4] Cheng Ac, Wee Ag, Shiu-Yin C, Tat-Keung L. Prosthodontic Management Of Limited Oral Access After Ablative Tumor Surgery: A Clinical Report. J Prosthet Dent 2000;84:269-273.

[5] Garg Sk, Bansal S, Shireen Rk. Microstomia In A Maxillectomy Patient: A Prosthetic Challenge. Contemp Clin Dent 2011;2:34-36.

[6] Gözdetürk Ag, Ulusoy M. A Collapsible Partial Denture For A Patient With Limited Mouth Opening Induced By Scleroderma: A Clinical Report. J Prosthodont 2015;24:334-338.

[7] Jensen J, Pedersen Ss. Osseointegrated Implants For Prosthetic Reconstruction In A Patient With Scleroderma: Report Of A Case. J Oral Maxillofac Surg 1990;46:739-741.