

Prosthetic rehabilitation of edentulous older adults with microstomia: A case series

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Abstract

Objectives:

Precise fabrication of complete dentures is essential to ensure optimal function, aesthetics, phonetics, and comfort for edentulous patients. Microstomia poses significant challenges for prosthetic rehabilitation, particularly in completely edentulous patients, as restricted mouth opening complicates impression making, jaw relations, and prosthesis insertion. This case series describes two clinical scenarios of edentulous older adults with microstomia managed using modified impression techniques and sectional prostheses where indicated. The report emphasises the importance of tailored approaches for successful functional and aesthetic rehabilitation.

Materials and methods:

Two completely edentulous older adults with varying degrees of microstomia were rehabilitated using sectional trays for impression making. In one case, conventional dentures were delivered, while in the second case with severe restriction, sectional dentures with rust-proof snap press button attachments were fabricated.

Results:

Both patients achieved satisfactory functional and aesthetic outcomes. The sectional approach effectively addressed the limitations posed by reduced mouth opening.

Conclusions:

Sectional impression trays and prostheses represent a viable, patient-centred approach for the prosthetic management of microstomia in older adults.

Keywords: Microstomia; Edentulism; Older adults; Sectional denture; Prosthetics; Geriatric dentistry

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I. INTRODUCTION

Microstomia, defined as an abnormally reduced oral aperture, presents a significant clinical challenge in prosthetic rehabilitation, particularly among older adults who are completely edentulous. The condition may arise due to congenital anomalies, trauma, surgical interventions, or systemic disorders such as scleroderma or oral submucous fibrosis, all of which are more prevalent or have a greater impact in older populations¹⁻³.

In edentulous older adults, restricted mouth opening can severely impair routine prosthetic procedures. Inserting standard impression trays, recording jaw relations, and delivering complete dentures often become impractical. Additionally, age-related reductions in manual dexterity and cognitive function can further compromise the patient's ability to manage complex prostheses^{4,5}.

The literature describes several modifications to conventional techniques for managing such cases, including the use of sectional or collapsible impression trays, flexible denture materials, and sectional prostheses with mechanical, magnetic, or snap-fit locking mechanisms^{3, 11}. These approaches aim to restore oral function, improve aesthetics, and enhance quality of life, all while respecting the physical and cognitive limitations commonly encountered in geriatric patients^{1,3, 11}.

This case series presents two completely edentulous older adults with microstomia managed using sectional techniques tailored to their specific clinical needs. The report highlights the importance of individualised, minimally invasive, and functionally effective prosthetic solutions for this unique subset of patients.

II. CASE REPORTS

2.1 | Case 1

A 66-year-old female patient reported for complete denture rehabilitation with complaints of difficulty in mastication and speech due to edentulism. The patient had a restricted maximal mouth opening of 23 mm.

Management:

Primary impressions were made using condensation silicone putty (Speedex®, Coltène/Whaledent AG, Altstätten, Switzerland)³. Sectional custom trays were fabricated with a locking mechanism using rust-proof snap press buttons³. Each side of the tray was separately border-moulded with low-fusing compound to avoid distortion due to limited access³. Tray segments were assembled extraorally. Final impressions were made with the interlocked, border-moulded tray.

Jaw relations were recorded conventionally. Complete maxillary and mandibular dentures were fabricated and delivered as a whole. The patient could insert and remove the dentures without difficulty using a rotatory movement³.

Outcome:

The patient reported satisfaction with the dentures in terms of aesthetics, stability, and masticatory efficiency. Follow-up at 3 and 6 months revealed no complications.

2.2 | Case 2

A 70-year-old male presented with complete edentulism and a severely restricted oral opening (15 mm inter-incisally) due to carcinoma of the mandible, managed with hemimandibulectomy two years prior. The patient reported significant difficulty with oral hygiene, mastication, and denture use.

Management:

Primary impressions were taken using condensation silicone putty³. Sectional custom trays with a locking mechanism (rust-proof snap press buttons) were fabricated³.

Secondary impressions were made sectionally using zinc oxide eugenol paste³. Border moulding was performed on one half of the tray (pink), followed by an impression for that side (Fig 9). After setting, the second half was inserted, leaving the first section (pink) stable to prevent distortion. The second section (purple) was border-moulded, removed, loaded with impression material, and interlocked with the first section (pink) intraorally. After setting, the segments were removed separately and reassembled extraorally for accurate alignment³.

Jaw relations were recorded using sectional record bases with a locking mechanism³. A maxillary denture was fabricated in two sections incorporating snap press buttons for intraoral assembly³.

Outcome:

The patient successfully adapted to the sectional denture, reporting improved mastication, speech, and comfort. No mucosal trauma or prosthesis dislodgement was observed during follow-up.

III. DISCUSSION

Prosthetic rehabilitation of older adults with microstomia requires careful planning and consideration of both anatomical limitations and age-related factors such as reduced manual dexterity, cognitive decline, and comorbidities^{1,2}. Conventional prosthetic techniques are often impractical when faced with restricted oral access^{1,3,11}.

The use of sectional trays and prostheses, as demonstrated in these cases, enables successful management of severely restricted mouth openings^{3, , , 1}. Various designs have been proposed, including mechanical

interlocks, magnets, snap buttons, and flexible materials, all aiming to enhance prosthesis insertion and stability without compromising function^{3, 11, 12}.

Older adults are particularly vulnerable to the functional and psychosocial consequences of edentulism, including nutritional deficiencies, impaired speech, and social withdrawal^{1, 3, 13}. Addressing these issues in the presence of microstomia is essential to improving quality of life^{1, 3, 1}.

Recent literature also highlights the role of digital technologies for enhanced prosthetic rehabilitation in such complex cases¹. Additionally, reports describe the successful application of collapsible or foldable dentures, magnetic attachments, and hybrid designs for managing microstomia effectively^{12, 11}.

These cases emphasise that individualised, minimally invasive prosthodontic approaches, when adapted to the specific needs of geriatric patients, can effectively restore oral function and aesthetics, even in complex situations such as microstomia.

IV. CONCLUSIONS

Microstomia in older edentulous adults presents significant challenges for prosthodontic rehabilitation. Sectional impression techniques and sectional dentures offer practical and effective solutions tailored to the degree of mouth opening limitation. A patient-centred approach, incorporating modifications based on clinical assessment, functional requirements, and patient adaptability, is essential to achieve successful outcomes in this population.

5 | ETHICAL CONSIDERATIONS

Informed consent was obtained from both patients for the treatment provided and for the publication of clinical details and images. The study adhered to ethical principles for clinical case reporting.

6 | CONFLICT OF INTEREST

The authors declare no conflict of interest.

7 | FUNDING

This work received no external funding.

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Figures and Legends

Case 1:



Fig 1- Reduced mouth opening(interarch distance- 23mm)

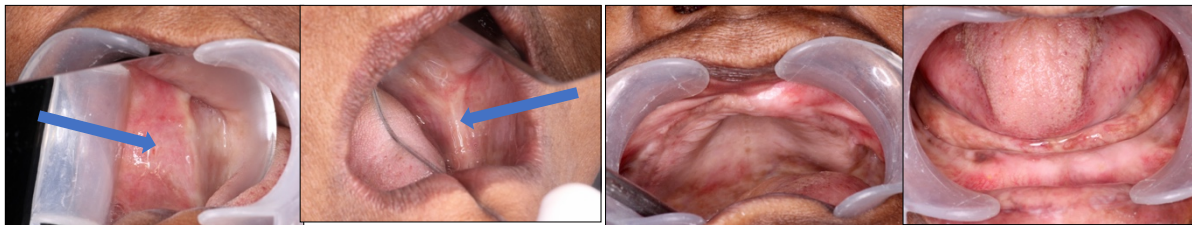


Fig 2- Intraoral findings- Fibrous bands present bilaterally in buccal sulcus.

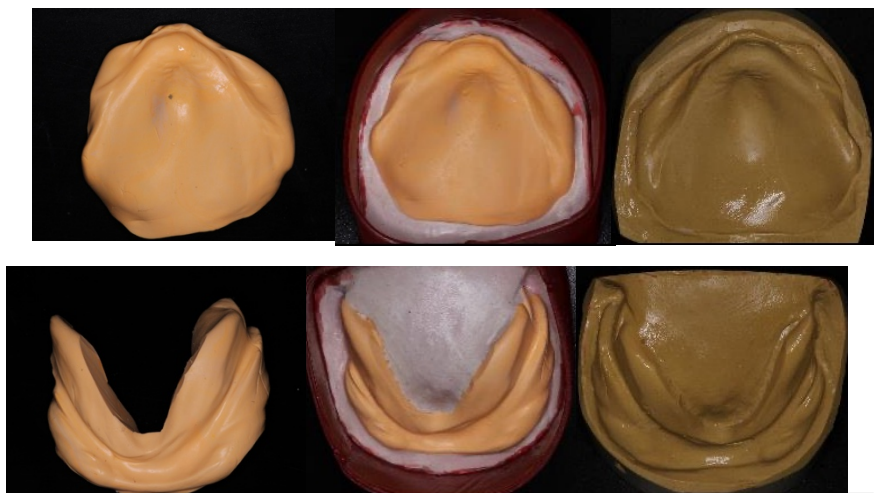


Fig 3- The Primary Impression using condensation Silicone putty (Speedex, Coltène /Whaledent AG, Altstätten, Switzerland).F

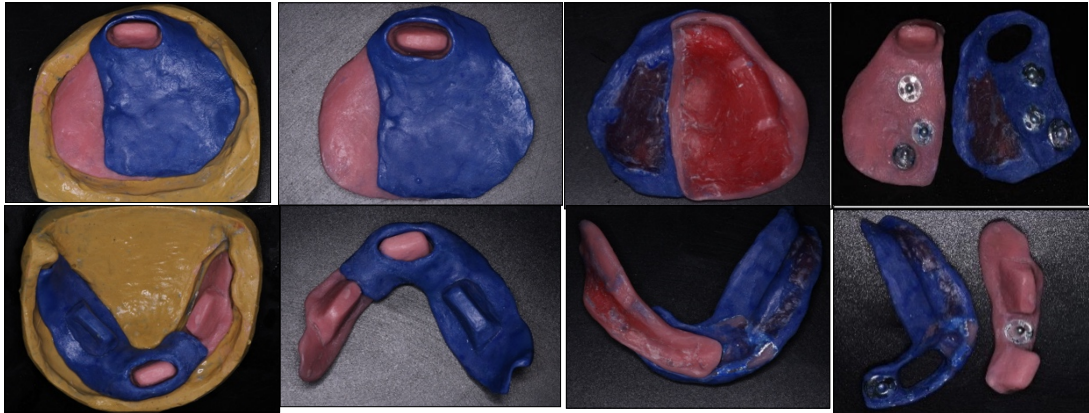


Fig 4- Sectional dentures with rust proof snap press button attachment

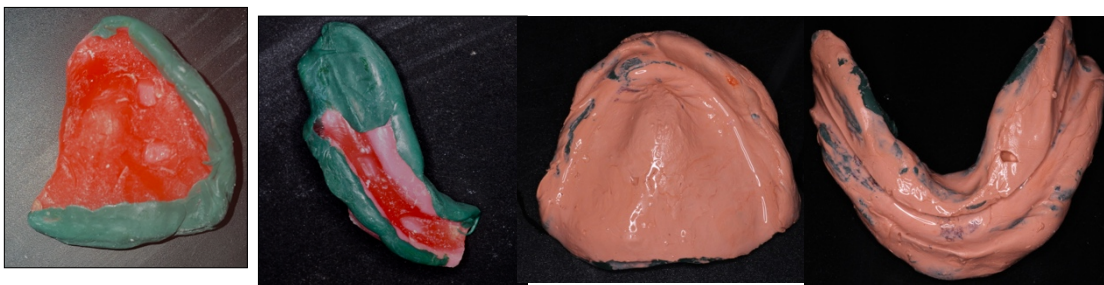


Fig 5- Separate border moulding and final impressions merging the trays



Fig 6- Conventional complete dentures

Case 2:

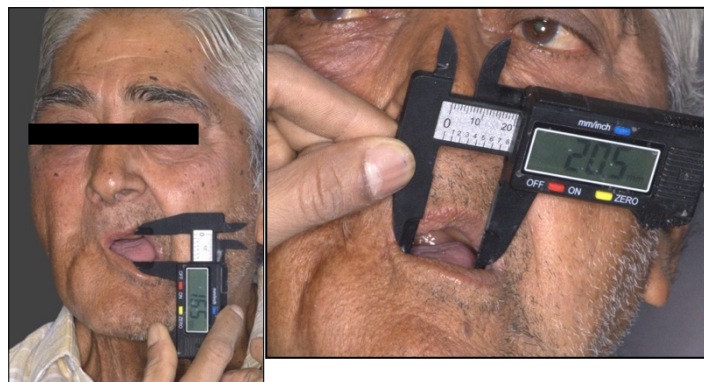


Fig 7- Reduced mouth opening(interarch distance- 15mm)

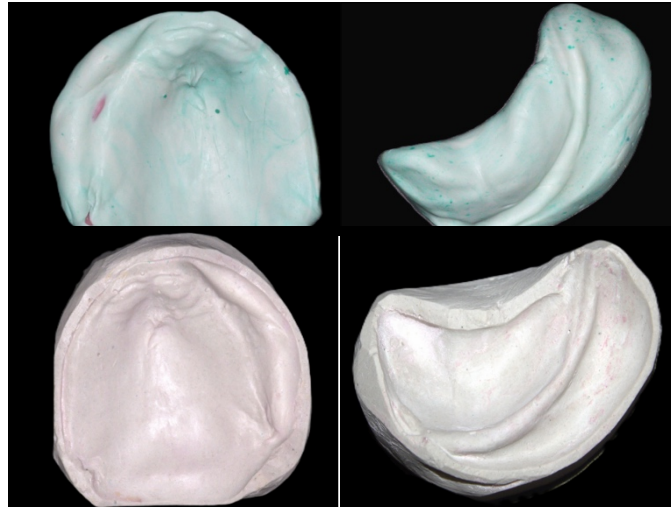


Fig 8- The Primary Impression using condensation Silicone putty (Speedex, Coltène /Whaledent AG, Altstätten, Switzerland).F



Fig 9- Sectionally made final impressions

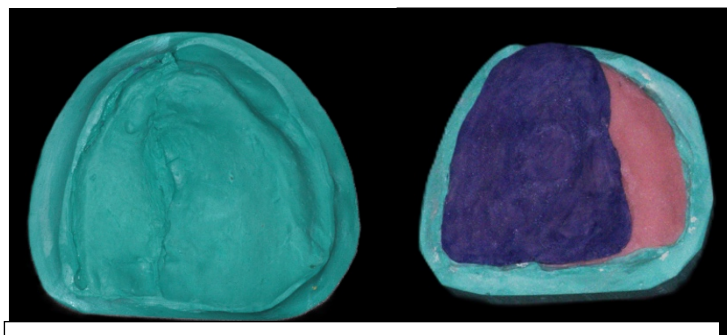


Fig 10- Record base in sections

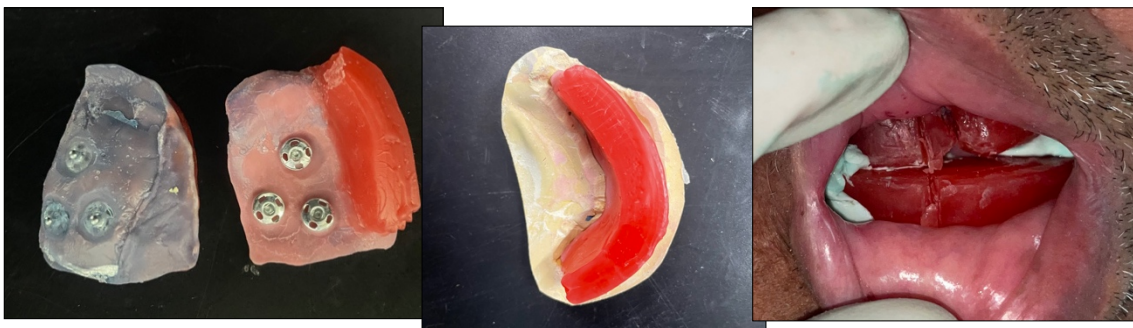


Fig 11- Jaw relations recorded using sectional record bases

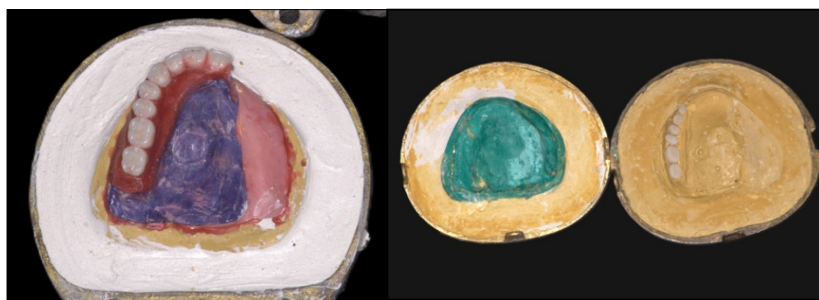


Fig 12- Flasking



Fig 13- Sectional complete dentures



Fig 14- Pre-operative and post-operative view