

## CASE REPORT

### Management of fully edentulous with flabby ridge using double spacer custom tray and modified impression techniques

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#### ABSTRACT

**Keywords:** Complete denture, Double spacer custom tray, Flabby ridge, Selective pressure impression technique

A flabby ridge refers to an area of alveolar ridge with hypermobile and fibrous soft tissue that typically forms as a result of prolonged pressure or unstable occlusion, which posing difficulties in achieving proper denture retention, support, and stability. A precise impression is essential for ensuring the stability of complete dentures with flabby ridge. The fundamental principle for impressions of a flabby ridges is to apply minimal pressure on the flabby area to prevent distortion impression outcome. To achieve that, double spacer custom tray along with selective pressure impression techniques was employed. This case report aims to gain impression with minimum pressure on flabby ridge to enhance retention, support, and stability of the complete denture. A 70-year-old male patient came to the Polyclinic Prosthodontics Oral dan Dental Hospital Universitas Padjadjaran complaining that his old 10-years-used denture felt loose and uncomfortable. Intraoral examination showed that both maxillary and mandibular arches were fully edentulous, with flabby ridges present. Following the assessment, it was decided to make a new complete denture using double spacer custom tray and selective pressure impression techniques. Double spacer custom tray and selective pressure impression techniques have been effective in minimizing pressure that could lead to tissue compression during impression procedures, resulting more comfortable dentures with greater retention and stability. (IJPD 2025;7(1):43-47)

#### Introduction

Abnormalities of the denture-supporting tissues present a challenge for dentists, particularly in the fabrication of complete dentures.<sup>1</sup> The primary objective of complete denture treatment is to restore function, aesthetics, and patient comfort with a prosthesis that provides adequate retention, stability, and support to replace the lost teeth and surrounding bone.<sup>2,3</sup> The residual ridge, as a denture-supporting structure, should ideally be covered by a mucosal layer measuring 1.5–2 mm in thickness.<sup>3,4</sup> In cases of flabby tissue, the mucosal layer consists of hyperplastic, mobile fibrous tissue located on the surface of the alveolar ridge. Flabby tissue occurs in approximately 24% of cases in the maxilla and 5% in the mandible, more frequently in the anterior maxillary region, and is often associated with combination syndrome.<sup>1-5</sup>

The Glossary of Prosthodontic Terms 9th edition (GPT-9)<sup>6</sup> defines flabby tissue as excessive tissue that is movable. This condition occurs due to the replacement of alveolar bone with fibrous tissue. It commonly develops in the anterior maxilla, especially when natural anterior teeth remain in the mandible—a condition known as combination syndrome—which results in unstable occlusal forces from the remaining natural teeth, thereby creating excessive loading on the residual ridge.<sup>7</sup> Other etiological factors contributing to flabby tissue include long-term denture wear without periodic maintenance, trauma from the denture base, ill-fitting dentures, malocclusion, and abnormal pressure on the denture.<sup>8,9</sup>

Flabby tissue forms as a result of excessive pressure or unstable occlusion on the alveolar bone supporting the denture, leading to the replacement of alveolar bone with hyperplastic fibrous soft tissue. This condition complicates denture retention, stability, and support.<sup>9,10</sup> Complete denture support is compromised when the mobile flabby tissue is displaced more than 2 mm under pressure.<sup>4,11</sup> The excessive movement caused by flabby tissue may result in clinical problems such as denture dislodgement and pain during function.<sup>11</sup> Because flabby tissue provides inadequate support, it easily displaces under pressure, reducing retention by disrupting the peripheral seal of the denture.<sup>12</sup>

Impression procedures in complete denture cases involving flabby tissue require special attention. During impression making, the applied pressure may cause displacement or distortion of the flabby tissue, making it difficult to obtain an accurate anatomical form. This can adversely affect the retention, stability, and support of the final complete denture.<sup>11-13</sup>

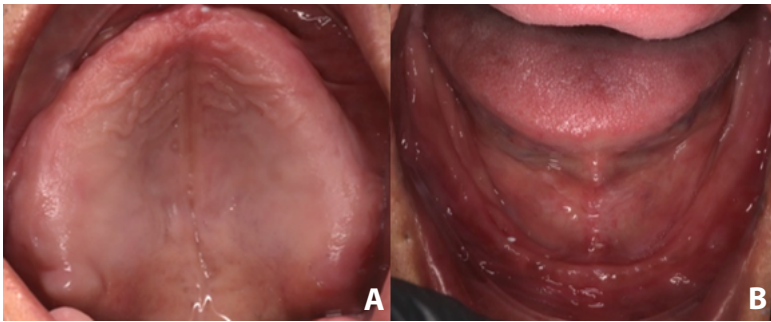
Management of flabby tissue is generally divided into three approaches. First, a surgical approach involving excision of the flabby tissue prior to denture fabrication. Second, fabrication of implant-supported dentures. Third, a non-surgical approach using conventional dentures with modified impression techniques.<sup>5,13,14</sup> Surgical removal

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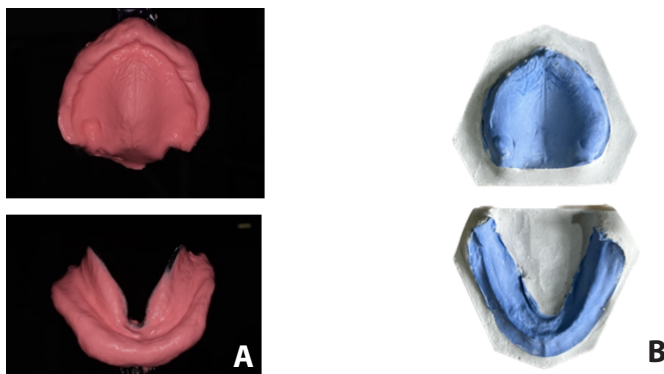
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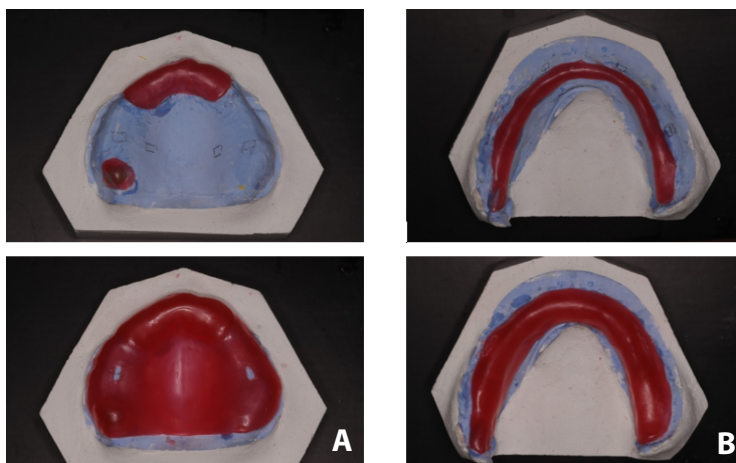
**Figure 1.** Extraoral profile of the patient.



**Figure 2.** Intraoral findings of the patient: A. Maxillary occlusal view, B. Mandibular occlusal view.



**Figure 3.** A. Preliminary impression with alginate, B. Cast study.



**Figure 4.** Fabrication of double spacer on; A. Maxilla and B. Mandible.

of flabby tissue is considered an effective method to create a firm denture-bearing area. However, this approach may reduce vestibular depth, thereby decreasing denture retention. Implant-supported prostheses provide additional support from the underlying bone and minimize reliance on soft tissue support, but they require higher costs and longer treatment time. Compared with the two approaches above, the non-surgical method using conventional prostheses with modified impression techniques and balanced occlusal contacts is more commonly selected, particularly for patients with compromised general health or limited financial resources.<sup>15,16</sup>

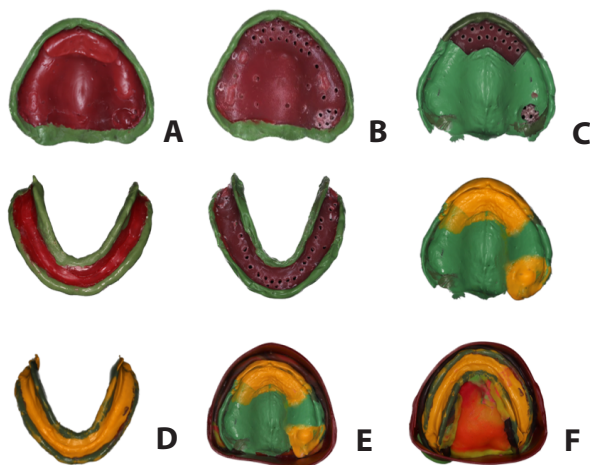
### Case Report

A 70-year-old male patient came to the Prosthodontics Clinic of Oral and Dental Hospital (RSGM) Universitas Padjadjaran with a chief complaint of difficulty chewing due to the loss of all teeth in both the maxilla and mandible. The patient had been wearing complete dentures for the upper and lower jaws for 10 years; however, the dentures had become loose and painful, especially during mastication. The patient reported no systemic conditions. He expressed a desire to have new dentures fabricated that would be more comfortable and free of pain during use [figure 1](#).

Intraoral examination showed that the patient had lost all teeth in the maxilla and mandible with flabby ridges present on region anterior and right tuberosity of maxilla, and the entire mandible [figure 2](#). Due to economic factor, patient refuse to do a treatment with surgical approach or implant-supported complete denture. After discussing, it was decided to make a new conventional removable complete denture.

Following the patient's approval of the treatment plan and completion of informed consent, a preliminary impression was made using irreversible hydrocolloid/alginate to produce a cast study. The obtained impression was subsequently poured with dental stone [figure 3](#). On the cast study, a double wax spacer was fabricated, with additional spacer placed over the flabby areas in both the maxilla and mandible [figure 4](#). A custom tray was then constructed using light-cured resin material. The borders of the custom tray were designed to be 2 mm short of the muco-buccal fold to provide space for muscle activation during border molding. The lips, cheeks, and tongue were evaluated during the intraoral try-in of the custom tray.

Border molding of both the maxilla and mandible was performed using greenstick compound along the borders of the custom tray [figure 5A](#). The wax spacer was then carefully removed from the custom tray without damaging the greenstick compound. Escape holes were subsequently created in the custom tray. In the flabby areas, the escape holes were made more numerous and wider to reduce pressure during the final impression [figure 5B](#). The final impression was taken



**Figure 5.** A. Border molding, B. Creating escape holes, C. Final impression of the maxilla, D Final impression of the mandible, E-F. Beading and boxing of the maxilla and mandible.



**Figure 6.** Determination of the parallelism of the maxillary bite rim from A. Left side, B. Front view, and C. Right side.



**Figure 7.** A. Determination of the parallelism of maxillary and mandible bite rim, B. Rest position of the patient, C. Establishment of vertical dimension in patient on centric relation.

using polyvinyl siloxane (PVS), with light-body material applied to the flabby areas and regular-body material to the non-flabby areas figure 5C – figure 5D. Beading and boxing procedures were carried out on the impression, which was then poured with dental stone to obtain the master cast figure 5E – figure 5F.

Record bases and bite rims were done on the master casts. The maxillary and mandibular bite rims were tried in the patient’s mouth. First, the parallelism of the maxillary bite rim was assessed using a Fox plane. At this stage, orientation lines were also determined on the bite rim, including the high lip line, low lip line, midline, and canine lines figure 6.

Subsequently, the mandibular bite rim was tried in, followed by determination of the patient’s

vertical dimension and centric relation figure 7. The patient’s vertical dimension at rest was measured at 76 mm, and the vertical dimension of occlusion was established at 73 mm. After determining the vertical dimension and centric relation, a facebow transfer was performed to transfer the maxillomandibular relationship to the cranial base onto the articulator. The bite rims were then secured using a stapler and removed from the patient’s mouth. The master casts with the bite rims were mounted on a semi-adjustable articulator figure 8. During this visit, the shade and shape of the artificial teeth were selected according to the patient’s skin tone, facial form, age, and gender, followed by the arrangement of the maxillary and mandibular artificial teeth figure 9.

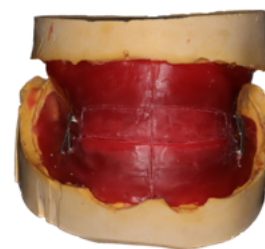
Next step was a wax try-in of the dentures in the patient. Aesthetics, midline, low lip line, smile line, as well as centric and eccentric occlusion were evaluated. After confirming satisfactory results, the laboratory procedures for complete denture fabrication were carried out, including packing, finishing, and polishing figure 10.

The completed complete dentures were evaluated for any sharp edges, unpolished, or rough surfaces figure 11. Afterward, the complete dentures were inserted into the patient’s mouth. During insertion, retention, stability, adaptation, denture base extension, centric and eccentric occlusion, as well as aesthetics were assessed figure 12. The patient was also re-educated on the proper insertion and removal of the prostheses, as well as instructions for cleaning and maintenance.

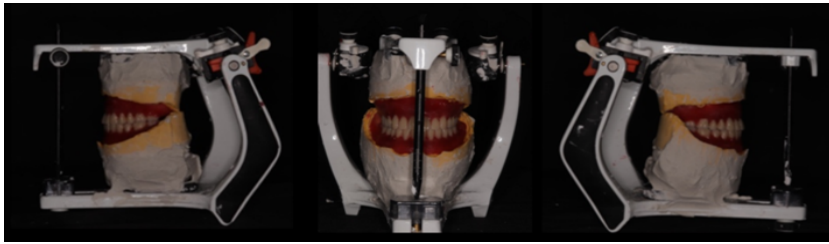
The patient then returned for a one-week post-insertion follow-up to evaluate the condition of the oral cavity and assess the patient’s adaptation to the new dentures. During this visit, both subjective complaints and objective examination of the oral soft tissues were performed. The patient reported that the new dentures were more comfortable and did not cause pain or pressure on the gums.

**Discussion**

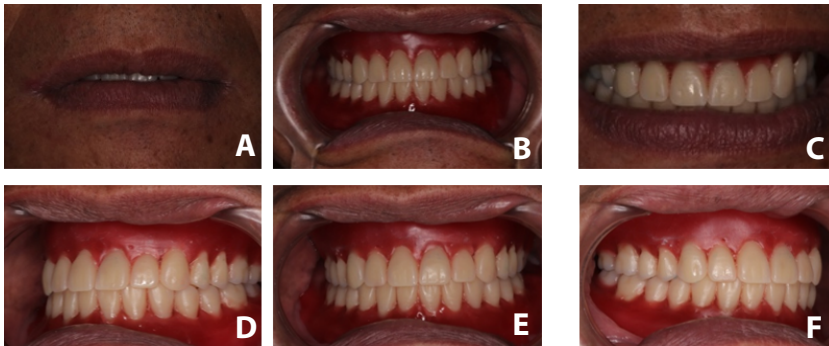
Compression of flabby tissue during conventional impression procedures can distort the fibrous tissue, resulting in poor stability during denture insertion.



**Figure 8.** Bite rims after fixation.



**Figure 9.** Arrangement of artificial teeth for the maxilla and mandible on semi-adjustable articulator.



**Figure 10.** Evaluation of the wax denture try-in: A. Low lip line, B. Occlusion, C. Smile line, D-F. Patient's occlusion from the left, front, and right views.



**Figure 11.** Complete dentures of the maxilla and mandible A. Left side, B. Frontal view, C. Right side.



**Figure 12.** Insertion of the complete dentures of the maxilla and mandible.

Movement of flabby tissue during function may alter the position of the denture and affect the peripheral seal, leading to inadequate retention and frequent dislodgement.<sup>5,16</sup> To obtain optimal support, impression technique plays a crucial role in the fabrication of dentures in cases with flabby tissue. The impression should apply pressure to the non-flabby tissues while avoiding pressure on the flabby areas.<sup>8</sup> Modified custom trays are

specifically fabricated as an alternative approach to manage edentulous cases with flabby tissue.<sup>17</sup>

The selective pressure impression technique is an important method designed to optimize denture function and comfort. By selectively applying pressure to primary stress-bearing areas and reducing pressure on non-load-bearing areas, this technique aims to distribute masticatory forces evenly. It involves the use of custom trays, selective relief methods, and dual-viscosity impression materials to ensure precise tissue recording.<sup>18</sup>

Flabby tissue should be recorded in a mucostatic condition, meaning in a resting state. Impression technique and impression material are two factors that can conservatively address this issue.<sup>19</sup> Several methods are used to provide relief to flabby tissue, including custom trays with additional escape holes, double spacers, and window techniques in custom trays.<sup>11</sup> Previous studies have reported that using custom trays with escape holes greater than 1 mm in diameter or a spacer thickness of 1.4 mm can effectively reduce pressure in edentulous areas. Pressure on flabby tissue can be minimized by providing additional relief space in the flabby area through the placement of two layers of baseplate wax as spacers and by increasing the number or size of escape holes in the custom tray.<sup>11-20</sup> The wax spacer placed in the custom tray provides sufficient space for the flow of low-viscosity final impression material, while the additional escape holes create an outlet pathway for excess material, thereby reducing pressure on the flabby area during impression making.<sup>21</sup>

Impression material selection is also a critical aspect in managing flabby tissue. The flow properties of the material significantly influence impression success. Polyvinyl siloxane (PVS) is an elastomeric impression material commonly used in clinical practice. PVS is available in various viscosities, including extra light, light (wash), medium (regular), heavy, and putty (extra heavy).<sup>1</sup> These different viscosity forms allow adaptation to the selected impression technique.

In this case, the flabby tissue in both the maxilla and mandible was most likely caused by long-term use of ill-fitting dentures and unstable occlusion over a 10-year period without regular follow-up. Management was performed using a non-surgical approach with modification of the impression technique through the use of a double spacer. The non-surgical approach was chosen by the patient considering cost and treatment duration. Custom trays were fabricated with a double spacer and additional escape holes in the flabby areas of both the maxilla and mandible. The final impression was made using dual-viscosity PVS impression material, with regular-body applied to non-flabby areas and light-body applied to flabby areas. Tooth arrangement was carried out until balanced occlusal contacts were achieved to prevent unstable occlusion

during function. After denture insertion, the patient reported satisfaction and improved comfort compared to the previous dentures. This demonstrates that the double spacer impression technique is effective in managing complete edentulism cases with flabby tissue during the fabrication of complete dentures.

This case report has several limitations. It presents the management of a single patient, limiting the generalizability of the findings to broader populations with flabby ridge conditions. The follow-up period was relatively short, and long-term evaluation is necessary to assess the stability, retention, and tissue response of the dentures over time. In addition, the clinical outcomes were primarily based on subjective patient feedback and conventional examination, without quantitative assessment of pressure distribution or tissue displacement. Further studies with larger sample sizes and longer observation periods are needed to support the effectiveness of the double spacer impression technique.

## Conclusion

The impression technique using a double spacer and additional escape holes in a custom tray has been proven effective in reducing pressure that may cause compression of flabby tissue during the impression procedure. This is an important factor in producing precise and comfortable complete dentures for patients with flabby tissue.

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