

## CASE REPORT

### Improving obturator retention in hollow palatal defect using silicone soft-reliner

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#### ABSTRACT

**Keywords:** Hollow bulb, Obturator, Palatum defect, Soft-reliner

Defect in the intraoral maxilla or palate resulting from surgical hemimaxillectomy can lead to difficulties in chewing, speaking, swallowing, and may also affect psychological function. One effective rehabilitation method for restoring oral function is the obturator prosthesis. This case report discusses the rehabilitation of a palatal defect following hemimaxillectomy, utilizing a hollow bulb obturator with a silicone-based soft liner and incorporating extracted posterior teeth as immediate dental provisions for relining an interim denture. The patient, a 46-year-old male, presented at Universitas Gadjah Mada Dental Hospital with complaints of discomfort, instability, and inadequate palatal coverage from his prosthetic obturator after undergoing tumor removal in the right maxillary area two years earlier. Examination revealed a significant hollow defect under the palate, exposure of the inferior nasal conchae, and mobility in the first and second premolars on the right side. Panoramic radiographs indicated loss of ridge support around these teeth. To enhance retention and comfort, a silicone-based soft liner was applied to the obturator. The use of extracted teeth proved beneficial for improving occlusal force, strength, and aesthetics. Thus, a hollow ground obturator with a soft reliner is recommended for effective rehabilitation post Class II Aramany hemimaxillectomy. (IJP 2025;6(1):6-9)

#### Introduction

The oral cavity commonly referred as mouth, a part of digestive system which functioned in speech, mastication, and occlusion in life, is enclosed by lips anteriorly, oropharynx at the posterior side, both hard and soft palate superiorly, tongue as the floor with a lining of buccal mucosa lining, upper and lower teeth, and peridontum.<sup>1,2</sup> The soft tissues of the mouth comprise the tongue, floor of the mouth, buccal mucosa, and the retromolar trigone that extends to the tonsillar region.<sup>3</sup> The oral functions include swallowing, speech, mastication and esthetic aspects of facial features that impact human quality of life. The defect on maxilla that creates nasal and oral cavities communication (oro-nasal defect) will impair oral-maxillofacial functions.<sup>4,5</sup>

Maxillofacial defects are usually complex, involving skin, multiple layers of mucosa, muscle, cartilage, and bone.<sup>6</sup> The etiology of maxillofacial defect are broadly classified into congenital and acquired. Trauma, radiation burns, surgical intervention, infection, bone osteonecrosis and some pathological disorders fall under the category of acquired maxillary defects.<sup>7,8</sup> Surgery, as a treatment for cancer that not responding to chemotherapy and radiation, unfortunately could cause wide range of acquired maxillofacial defect. This condition gave rise to concern on understanding the acquired defect to help with the rehabilitation. There were several classification that classify maxillofacial defects, one of them is Aramany's classification that

presented in 1987.<sup>9</sup> Based on a cohort of 123 patients' incidence of defect occurrence, Aramany's divided the defects according to defect relations with the abutment teeth in 6 categories.<sup>9,10</sup> This classification might offer guidance in obturator design.<sup>9</sup>

The most common approaches to the reconstruction of maxillary defects have included prosthetic rehabilitation with obturators and microvascular free flap transfers.<sup>8</sup> Obturator helps to separate the oral and nasal cavity, prevent food or liquid regurgitation, improving on speech as well as facial profile, and giving the benefit for easier cancer recurrence detection.<sup>11,12</sup>

In this case report the author described the utilization of silicone soft-reliner to improve the obturator retention and to provide better defect coverage in order to improve patient quality of life.

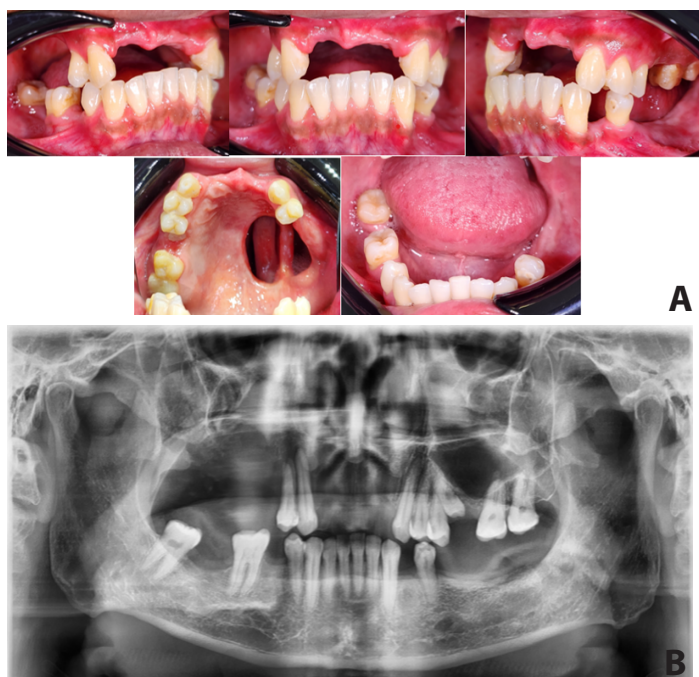
#### Case Report

At Universitas Gadjah Mada Dental Hospital, a 46-years-old male patient, presented with complaints on discomfort, instability, and inadequate palatum covering of his prosthetic obturator after tumor excision on his right maxillary region two years ago.

Upon physical examination, a deep, hollow defect under the palatum [figure 1A](#) were discovered as well as an exposed inferior nasal conchae and the nasal cavity's lateral wall.

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**Figure 1. A. Intraoral examination, B. Panoramic radiograph**



**Figure 2. A. Preparation of making the silicone index, B. The relining process of previous interim denture after tooth 14 and 15 extraction**

On the right maxilla, there was third-degree mobility in the first and second premolars. According to the panoramic radiography [figure 1B](#), The first and second premolars on the left maxilla area's ridge support had ceased, and there were additional teeth on the right maxilla region between them. A several tooth loss can be seen 18, 17, 16, 13, 12, 11, 21, 22, 26, 38, 37, 36, 34, 45, 47, and the rest of the remaining tooth is still in healthy state.

Due to the tooth's third-degree movement, tooth 14 and 15 had to be extracted as a preliminary treatment. Before that, a silicone index using silicone putty with the patient's using his previous interim denture was made as a preventative step against the occlusion key lost once the extraction was completed [figure 2A](#).

The extracted tooth served as a natural replacement for the interim denture, and silk thread was utilized to stitch the extraction site. The teeth were first severed in half, and the pulp was then taken out. Following that, the pulp room was expanded to accommodate the acrylic, and the tooth was disinfected for five minutes in 5% NaOCL. After the cleaning, the tooth was placed into the silicone index along with the temporary denture. The acrylic was poured as a reliner and molded into the mouth. Once the acrylic had hardened. The temporary denture was taken out then any extra acrylic was cut and polished [figure 2B](#).

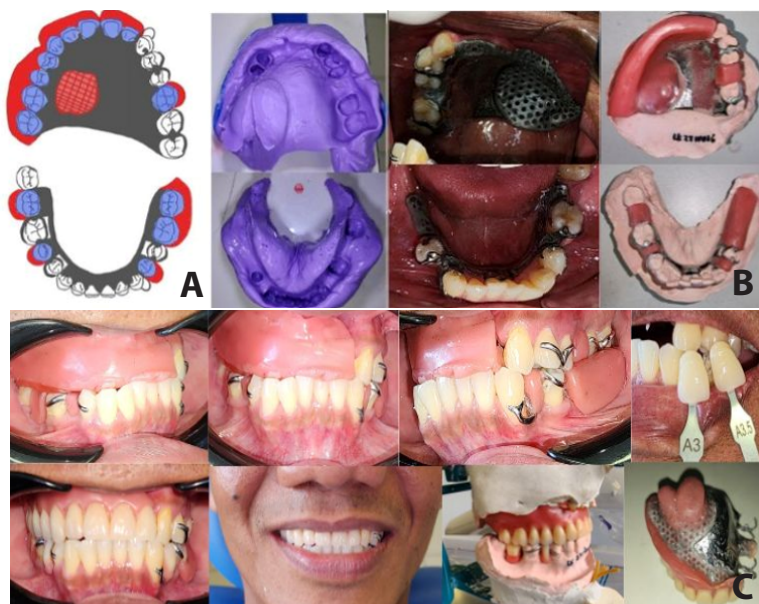
After a week, an inspection and hefting off were conducted on the surgical wound. To create a final denture, fresh impressions were cast after two months. The prior Kennedy classification changed to Kennedy class 1 as a consequence of the tooth extraction, thus explaining why the RPD was created [figure 3A](#). The laboratory created the metal frame based on the cast, and once the metal frame was returned, the try-in procedure was completed. The maxilla-mandibular relation (MMR) and bite rim making would be performed after the metal frame was correctly positioned [figure 3B](#).

The bite rim was marked with the smile line, canine line, and median line as MMR was carried out. After using bite registration material to record the biting record, the articulator was mounted. Both the second try-in and the positioning of the artificial teeth were completed. Once the layout didn't require any adjustment, the laboratory was utilized to make the acrylic and hollow bulb. The third attempt was made to examine the oral occlusion, pain, ulcer, retention, and stabilization of the completed RPD [figure 3C](#).

An issue regarding RPD retention was found during the inspection. In order to fix the retention problem, silicone reliner was required. After applying primer and silicone to the acrylic hollow bulb, it was molded into the palatum hollow [figure 4A](#). The denture was removed once the silicone had hardened, and the undercut surrounding the hollow bulb was discovered. This undercut could benefit in the hollow bulb retention.

After 3 month after using his new obturator [figure 4B](#) the patient was asked about his testimonial. Patient is satisfied with the treatment, the obturator fit perfectly and he feel comfortable using the new obturator, it helps restore the mastication function, and the aesthetic makes him more confident. While eating and drinking, he feel no more choking and he can speak fluently after using his new obturator.





**Figure 3.** A. RPD design, B. RPD frame fitting, C. MMR and the laboratory process



**Figure 4.** A. The relining process of the final denture using silicone soft-reliner, B. The result between before and after treatment

## Discussion

An obturator prosthesis is essential to a patient's ability to regain oral function following a maxillectomy. The design of the obturator structure may vary depending on the defect classification system.<sup>13</sup> Obtaining proper retention, stability, support for prosthetic treatment, relieving pain and ease of use is the most frequent issues.<sup>14-16</sup> Hence, all removable obturator prosthesis should be designed with basic prosthodontic principles in mind, such as wide stress distribution, cross-arch stability with a rigid major connector, along with stabilizing and retaining components at proper arch locations to effectively reduce dislodging functional forces.<sup>13</sup>

Intraoral examination in this case revealed an Aramya class II maxillary defect in the right maxilla.<sup>3</sup> Speaking, eating, and appearing normal are all made possible with a definitive obturator, which serves as a barrier between the nasal and oral cavities.<sup>17,18</sup> When fabricating a definitive obturator, caution should be exercised to ensure that the site is free from new difficulties. Only after the defect's size is dimensionally stable should the final prosthesis be provided. In this case, the intervention is an end-of-treatment procedure.<sup>18</sup>

A tripodal design was employed in this instance. The prosthesis was supported by the remaining teeth, the palate, and the rest. The left first premolars, second premolars, and canines were prepared for resting, as were the second and third molars in the left quadrant of the maxilla. Optimizing the distribution of the functional load across the tissue was the aim of the entire palate design. To provide retention, double akers are used on the second and third molars as well as the first and second premolars. Stability is provided by the left caninus RPI-bar clasp. However, since the arch is only made of one side, it is unable to adequately support the denture's retention. Consequently, using a soft retainer with a silicone base is required to improve retention.

A recent systematic review found that the masticatory function of denture users was improved when soft silicone reliner was compared to typical acrylic resin materials. Researchers that compared silicone soft reliner to conventional hard acrylic denture relining discovered considerable improvements in patients' overall health and enjoyment of life, as well as their ability to eat and swallow.<sup>19,20</sup>

## Conclusion

The application of a soft reliner with a silicone base could improve obturator retention, resulting in enhancing the one sided denture anchorage. On the other hand, it provides better defect coverage which reduces oro-antral interaction and increases comfort while speaking, eating, and drinking. Utilizing the the patient's natural teeth in place of artificial ones may help the patient maintain occlusion caused by tooth extraction as well as provide the benefit of having similarcolored teeth.

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