Journal of Dental Sciences

Volume 21 | Issue 2 Article 86

Clinical application of an obturator for maxillary defect reconstruction after ameloblastoma excision

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Journal of Dental Sciences 21 (2026) 1320–1322

Available online at https://jds.ads.org.tw/journal/

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KEYWORDS
Obturator;
Maxillary ameloblastoma;
Removable dentures;
Dental technician;
Resection

Ameloblastoma is a benign tumor of the jawbone and accounts for approximately 1 % of all oral tumors. It mainly occurs in the mandible while the ameloblastomas in the maxilla represent only about 1–20 %. The tumor is most commonly observed in the adults between 30 and 40 years of age.[1,2] Because ameloblastoma is locally invasive, it shows a high recurrence rate and the clinical treatment strategies are mainly based on surgical resection.[3] When a tumor occurs in the hard palate, it often causes extensive tissue loss including the teeth and may even result in opening of the maxillary sinus, thereby impairing chewing, speech, and daily functional activities. For this type of defect, the fabrication of an obturator is a commonly used reconstruction method in the clinical practice and it provides closure of the maxillary sinus and restoration of oral function.[4,5]

This study involved a young woman with a rare case of ameloblastoma (Aramany's class I defect) in the maxilla that carried a high risk of recurrence and required special attention (Fig. 1A). Two weeks after tumor resection, clinical observation revealed a clear maxillary sinus opening in this patient (Fig. 1B). The initial impression was obtained using alginate impression material (Jeltrate, Dentsply Sirona Inc, Charlotte, NC, USA) to capture the oral cavity and sinus defect morphology. A working model was created by pouring dental hard plaster to serve as the basis for fabricating a temporary occluder. The model was then sent to the dental technology laboratory for clinical procedures including denture alignment using Bioform IPN (Dentsply Sirona) fabrication of metal forged dental hooks using Wironit (Bego, Bremen, Germany), thermal polymerization of resin using Lucitone 199 (Dentsply Sirona), and polishing to complete the fabrication of a temporary occluder (Fig. 1D). The surgical wound continued to heal and contract and therefore there was a significant contact with the occluder during the follow-up. The adhesion to the tissue surface was then checked using pressure indicating paste (PIP, Keystone Industries, Gibbstown, NJ, USA). After the pore closure was loaded, the PIP dissipated and appeared pink (Fig. 1E). If necessary, areas that made premature contact were removed. Five months after the tissue repair process, a permanent obturator will be fabricated to improve oral function.

The initial mold for the permanent pore closing device was made using alginate material to obtain a preliminary shape (Fig. 1F). A framework was then fabricated using cobalt-chromium metal (Biosil®F, Degudent, Dentsply Sirona), and an impression holder was constructed in the edentulous area to improve impression accuracy (Fig. 1G). To overcome subsidence or deformation of soft tissue, this study used a secondary impression technique with Peri Compound (GC Corporation, Tokyo, Japan) to reimprint the

https://doi.org/10.1016/j.jds.2025.12.024

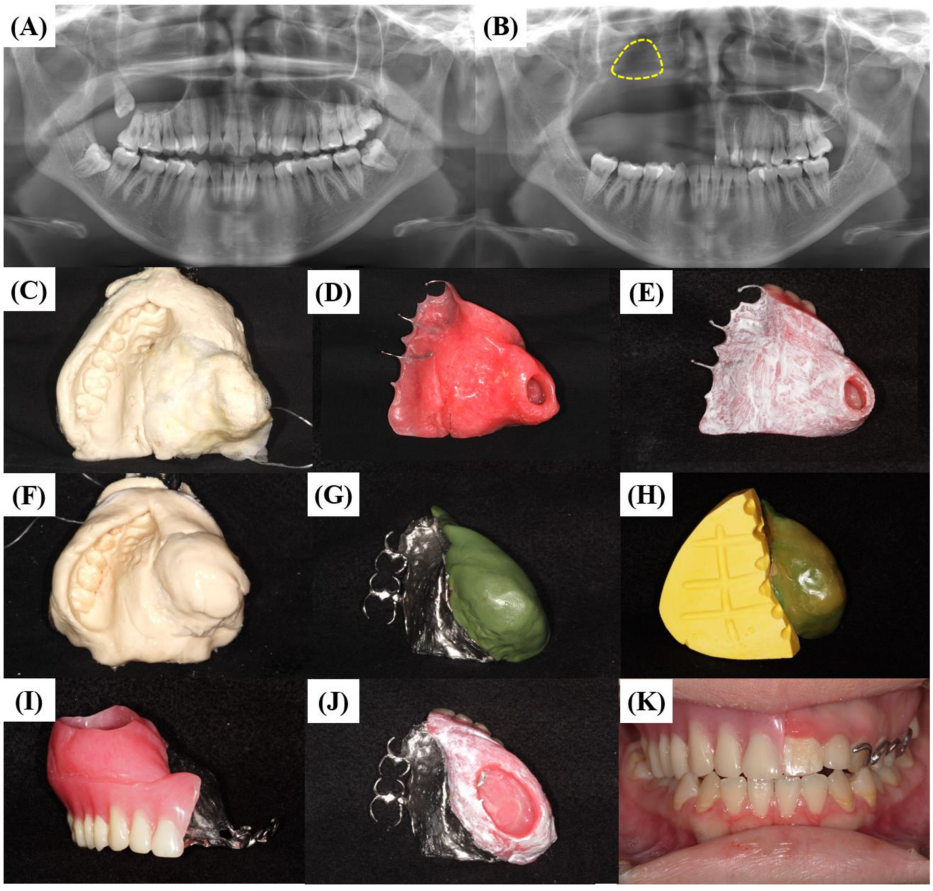

Figure 1 The process of creating an obturator. (A) Panoramic radiograph before ameloblastoma treatment. (B) Panoramic radiograph after ameloblastoma excision. The yellow area indicated the defect site. (C) Initial impression procedure. (D) Tissue surface view of the temporary obturator. (E) Intraoral follow up evaluation of the temporary obturator. (F) Initial impression of the permanent obturator. (G) Secondary impression procedure performed with a metal framework. (H) Tissue surface of the replaced stone model. (I) Labial view of the definitive obturator removable partial denture fabricated with a new tissue surface. (J) Intraoral follow up of the permanent obturator. (K) Final intraoral view of the permanent obturator after installation.

soft tissue area, thereby allowing the model to more accurately reflect tissue morphology (Fig. 1H). The fabrication process for the permanent obturator was similar to that of the temporary obturator and included denture alignment thermopolymerization of resin and polishing. The final prosthesis exhibited excellent fit and uniform force distribution in the oral cavity (Fig. 1I) and a follow-up evaluation was conducted one month after insertion of the obturator (Fig. 1J). The obturator successfully closed the sinus openings and restored the patient's chewing function and esthetic appearance (Fig. 1K).

Early diagnosis and complete resection of ameloblastoma were crucial for the prognosis. However, in the maxillary cases the surgical boundaries were difficult to determine due to proximity to the important anatomical structures and the risk of recurrence was relatively higher. Therefore, a long-term and regular follow-up was required after surgery. Obturator devices were one of the primary reconstruction methods for the maxillary defects. They not only provided sinus isolation but also immediately restored speech, eating, and psychosocial function which was especially important for the young patients. Through close collaboration between dentists and dental technicians, this study achieved both functional and esthetic treatment outcomes in the complex cases of oral defects. Future research aimed to address more challenging clinical cases.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

Acknowledgments

None.

References

1. Hendra FN, Van Cann EM, Helder MN, et al. Global incidence and profile of ameloblastoma: a systematic review and meta-analysis. *Oral Dis* 2020;26:12–21.

2. Chen C, Batstone M, Taheri T, Johnson N. Surgical resection and reconstruction of ameloblastoma: a 13-year retrospective review. *J Oral Maxillofac Surg* 2024;82:862—8.
3. Saverio C, Antonio B, Hao HZ, et al. Definitive palatal obturator applications: a systematic literature review. *Prosthesis* 2025;7:112.
4. Alves MC, Vieira-Silva IF, Almeida MLA, et al. Obturator prostheses with intramucosal retention system in patients with maxillectomy. *Oral Maxillofac Surg* 2024;28:1529—37.
5. Anpalagan A, Tzortzis A, Twigg J, Wotherspoon R, Chengot P, Kanatas A. Current practice in the management of peripheral ameloblastoma: a structured review. *Br J Oral Maxillofac Surg* 2021;59:e1—8.

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Received 18 December 2025
Final revision received 20 December 2025
Available online 1 April 2026