Using Acrylic Resin Tooth Veneers in Patients with an Abnormal Jaw Relationship: A Case Report

Tsung-Chieh Yang, DDS, PhD[a]/Yi-Hao Lan, DDS[b]/Tong-Mei Wang, DDS[c]/
Ching-Yu Tu, DDS[d]/Li-Deh Lin, DDS, PhD[e]

This case report describes and evaluates a method of arranging artificial teeth in patients with an abnormal jaw relationship in which a wider maxillary arch opposes a narrower mandibular arch. First, the fossa of mandibular posterior teeth was positioned on the crest of the mandibular edentulous ridge. The maxillary posterior teeth were then placed palatally to maximize occlusal contacts with the opposing mandibular teeth. Finally, acrylic resin tooth veneers were attached on the buccal surface of posterior maxillary teeth to improve the arch discrepancy. This method addresses functional considerations with the inner aspect of teeth and esthetic considerations with acrylic resin tooth veneers. *Int J Prosthodont 2014;27:570–572. doi: 10.11607/ijp.4064*

Complete denture stability is enhanced by parallelism of the primary denture-bearing areas. Problems may occur with tooth arrangement and occlusion with asymmetric arches.[1] In patients with larger maxillary and smaller mandibular arches and with maxillary posterior teeth conforming to the outline of anterior teeth, there may be inadequate occlusal contacts with mandibular posterior teeth. In contrast, if these patients have appropriate posterior occlusal contacts, the maxillary posterior teeth would be positioned palatally, resulting in a "key-hole" effect that is detrimental to esthetics.[2] This case report describes and evaluates a method of improving both occlusion and esthetics in patients with arch discrepancy using acrylic resin tooth veneers.

Case Report

A 63-year-old man with a complete maxillary denture requested a removable prosthesis for his completely edentulous mandibular ridge to improve chewing function. Clinical evaluation revealed acceptable tissue adaptation, border extension, and lip support for the maxillary denture, but the posterior teeth showed severe tooth wear. In addition, arch discrepancy was found in the posterior edentulous region, where the maxillary arch was wider than the mandibular arch (Fig 1). After discussion, the patient was treated with replacement of the maxillary posterior teeth and fabrication of a complete mandibular denture.

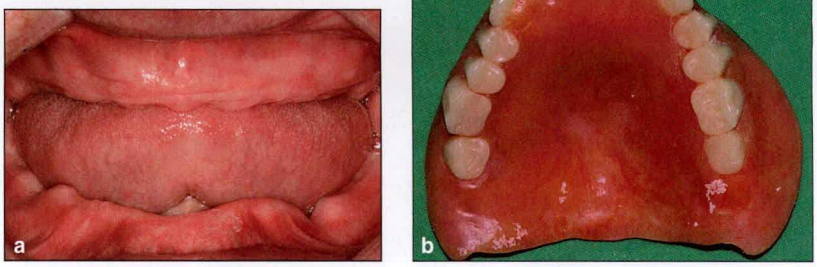
Prosthetic treatment began with border molding and functional impressions of the mandible. The vertical dimension and interocclusal record were transferred to an articulator. The severely worn maxillary posterior teeth were removed to leave space for tooth arrangement (Fig 2a). The anterior mandibular teeth were positioned to maintain adequate horizontal and vertical overlap. The central fossa of the mandibular posterior teeth was placed on the crest of the alveolar ridge. Next, the posterior maxillary teeth were placed to maximize occlusal contact, which positioned them palatal to the alveolar ridge crest (Figs 2b and 2c). Occlusion was adjusted to group function on the working side with bilaterally balanced contacts.

Next, another set of maxillary posterior teeth was ground to leave a thin layer (approximately 2 mm) of buccal surface to fabricate custom acrylic resin tooth veneers. The acrylic resin veneers were placed on the buccal surface of the posterior teeth, following the curvature of the anterior teeth and addressing esthetic considerations (Figs 2d and 2e). Wax should never cover the occlusal surface of the veneers because that could lead to tooth movement during denture packing. It was confirmed that the veneers did not interfere with occlusion. After a trial with wax dentures,

[a]*Assistant Professor, School of Dentistry, National Taiwan University, Taipei, Taiwan.*
[b]*Resident, National Taiwan University Hospital, Taipei, Taiwan.*
[c]*Lecturer, School of Dentistry, National Taiwan University, Taipei, Taiwan.*
[d]*Visiting Staff, Division of Prosthodontics, Department of Dentistry, Cathay General Hospital, Taipei, Taiwan.*
[e]*Professor, School of Dentistry, National Taiwan University, Taipei, Taiwan.*

Correspondence to: *Prof Li-Deh Lin, National Taiwan University, School of Dentistry, No. 1, Chang-Te street, Taipei 100, Taiwan. Fax: +886-2-23831346. Email: lidehlin@ntu.edu.tw*

Fig 1 **(a)** Frontal view of edentulous ridges. **(b)** Maxillary denture showing severe tooth wear in the posterior region and inharmonious tooth arrangement.



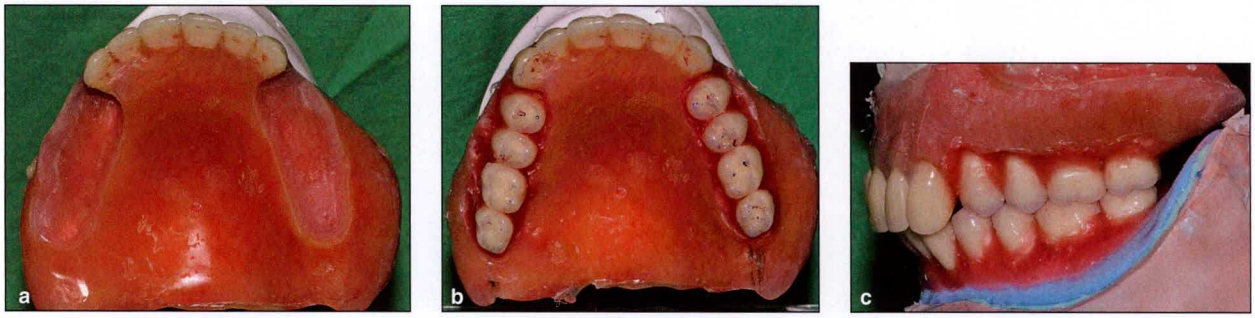


Fig 2 **(a)** Maxillary posterior acrylic resin teeth were ground out. **(b and c)** Maxillary and mandibular posterior teeth were placed to maximize occlusal contacts. **(d and e)** Acrylic resin tooth veneers were placed on the buccal surface, masking the discrepancy between anterior and posterior teeth.

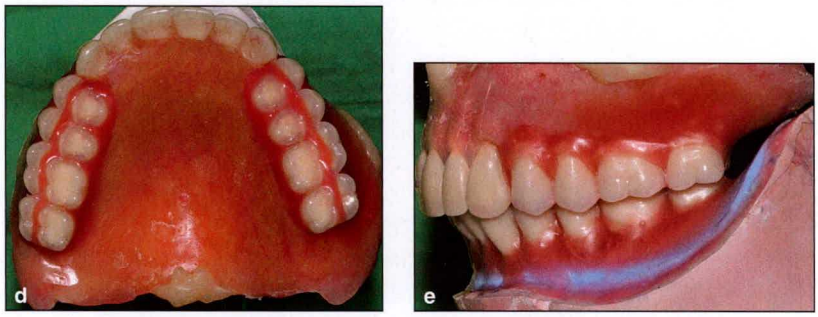


Fig 3 **(a)** Frontal and **(b)** buccal views of new prostheses.

definitive dentures were fabricated by packing, laboratory remounting, and polishing. Tissue and occlusal surfaces of the dentures were adjusted several times to maximize oral function (Fig 3).

In the follow-up period, stone dental casts were used to evaluate the efficacy of the occlusal relationship. The cross section from incisor to second molar demonstrated the following (Fig 4):

In the anterior region, the mandibular teeth were arranged to contact the maxillary teeth over the cingula.

In the posterior region, the occlusal contacts were designed in a "cusp-to-fossa" relationship with better occlusal force transfered to the ridge. The veneers on the maxillary posterior teeth did not interfere with functional occlusion.

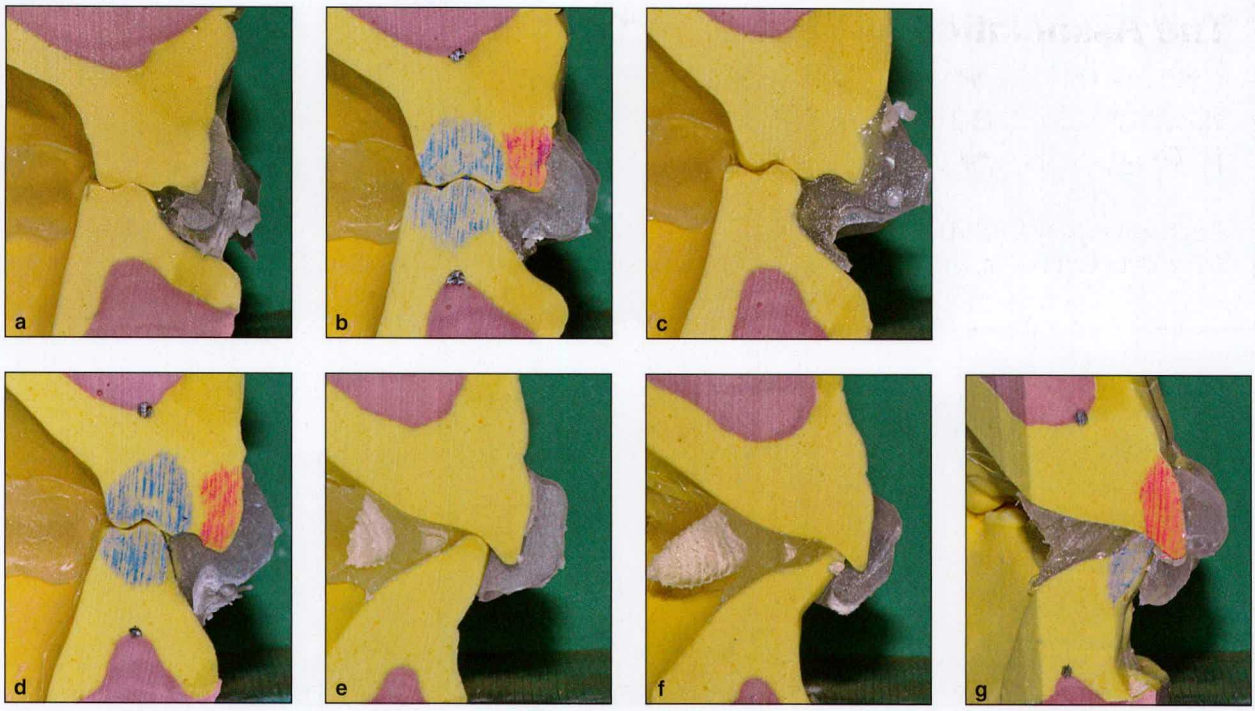


Fig 4 Cross section of stone cast showing occlusal relationships. Red stone reveals the residual ridge pattern and yellow stone represents the outline of the denture. **(a)** Second molar. **(b)** First molar. Blue portions represent maxillary and mandibular molars; red portion is veneer. **(c)** Second premolar. **(d)** First premolar. Blue portion represents premolars; red portion is veneer. **(e)** Canine. **(f)** Lateral incisor. **(g)** Central incisor. Red and blue portions are maxillary and mandibular incisors, respectively.

Discussion

In a normal ridge relationship, the maxillary ridge in the anterior region is slightly labial to the mandibular ridge and the interalveolar crest line between the ridges forms an 80-degree angle on the horizontal plane in the posterior region.[3] In patients with a wider maxillary arch opposing a narrower mandibular arch, palatolingual ramps or acrylic resin attached on the buccal surface of maxillary posterior teeth are reported to fulfill esthetic requirements and to provide cheek support.[4,5] Nonanatomical teeth or lingualized occlusion also are thought to provide freedom for mandibular movement.[2] In this case, a new set of artificial teeth were ground to fabricate veneers and packed into the denture, which allowed better abrasive resistance and natural tooth color. Occlusal relationships also were evaluated slice by slice with a stone cast, and adequate contacts were present from incisors to molars (Fig 4). However, this method requires more laboratory work than traditional dentures.

Conclusions

This report described and analyzed the attachment of acrylic resin tooth veneers to posterior teeth for a patient with an arch discrepancy and their effect on oral function. In this case, the new tooth arrangement maintained occlusal function of the inner tooth surfaces while improving esthetics with acrylic resin tooth veneers.

Acknowledgments

The authors reported no conflicts of interest related to this study.

References

1. Zarb GA, Hobkirk JA. History taking, treatment planning, and improving denture-bearing areas for edentulous patients. In: Zarb G, Hobkirk JA, Eckert SE, Jacob RF, eds. Prosthodontics Treatment for Patients. 13th ed. St Louis: Elsevier, 2013:53–92.
2. Curtis TA, Langer Y, Curtis DA, Carpenter R. Occlusal considerations for partially or completely edentulous skeletal class II patients. Part I: Background information. J Prosthet Dent 1988; 60:202–211.
3. Goyal BK, Bhargava K. Arrangement of artificial teeth in abnormal jaw relations: Maxillary protrusion and wider upper arch. J Prosthet Dent 1974;32:107–111.
4. Curtis TA, Langer Y, Curtis DA, Carpenter R. Occlusal considerations for partially or completely edentulous skeletal class II patients. Part II: Treatment concepts. J Prosthet Dent 1988;60: 334–342.
5. Shannon JL. A bilaterally balanced occlusal scheme for patients with arch width and curvature discrepancies. J Prosthet Dent 1980;44:101–103.