

## Congenital Partial Anodontia: Prosthodontic Considerations

Aris-Petros Tripodakis, DDS, MS, Dr Odont  
Practice Limited to Prosthodontics  
92 Vas Sophias Avenue  
Athens 115 28  
Greece

Patients presenting with congenital partial anodontia often have occlusal instability and esthetic problems resulting from the absence of permanent teeth. This creates a complex prosthodontic problem that may involve malposition of the permanent teeth, reduced retention and support for fixed reconstruction, inappropriate space available in edentulous areas, inadequate anchorage for orthodontic therapy, and reduced occlusal vertical dimension. Prosthodontic therapy becomes complicated and challenging. This article presents a variety of clinical approaches to addressing the prosthodontic problems. *Int J Prosthodont* 1988; 1:175-180.

Congenital partial anodontia is the absence of some permanent teeth, usually combined with the presence of some deciduous teeth. Such a condition may involve a few (hypodontia) missing teeth (Fig 1) or many (oligodontia) missing teeth (addressed in detail later in this article). Patients so afflicted usually present esthetic and/or occlusal problems that require prosthodontic care.

Congenital partial anodontia has been described extensively in the dental literature in terms of occurrence, diagnosis, pathology, and etiology; however, little has been written addressing the required restorative procedures.

A review of the literature reveals considerable clinical interest in the congenital absence of teeth from the standpoint of orthodontics and pediatric dentistry. The prosthodontic care proposed for younger patients tends to be conservative, with consideration of the continued growth of the face.<sup>1-4</sup>

Even for the adult patient there is a tendency for "conservative" care using removable partial dentures, overdentures, or resin-bonded prostheses as well as esthetic reshaping and laminate veneers.<sup>5-9</sup> Although fixed prosthodontics has been considered an excellent form of treatment for this anomaly, it is referenced only occasionally in the literature. Such



**Fig 1** Hypodontia with congenitally missing lateral incisors. An impacted permanent canine is present on the left with a retained deciduous lateral incisor.

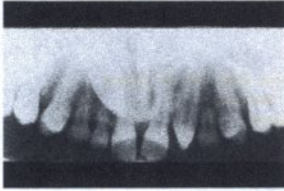
citations usually relate to the prosthetic replacement of a congenitally missing anterior tooth<sup>10,11</sup> and rarely involve a complete arch rehabilitation.<sup>12</sup> The possible reason is that many difficulties are encountered in treating such patients. These may include malposition of permanent teeth, a reduced number of abutment teeth, reduced length of the clinical crowns, inappropriate edentulous space, inadequate anchorage for potential orthodontic treatment, and reduced occlusal vertical dimension.

This article presents several possible therapeutic approaches to the prosthodontic care of patients with congenital partial anodontia.

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**Fig 2a** Radiograph of a patient with congenitally missing lateral incisors. The right canine has erupted mesially to the remaining deciduous canine. The left canine is impacted.



**Fig 2b** Following extraction of the retained deciduous teeth, orthodontic movement has brought the canines into the Class I position. Note the improper labiolingual inclination.



**Fig 2c** Fixed prosthodontic replacement of the lateral incisor with a resin-bonded retainer on the central incisor and a metal ceramic retainer on the canine.

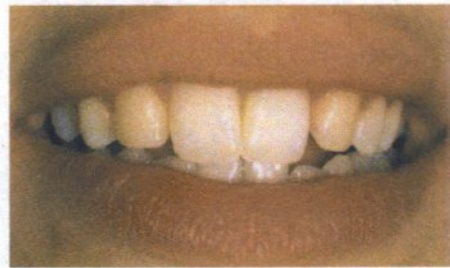
### Congenitally Missing Maxillary Lateral Incisor

The maxillary lateral incisor is frequently missing, and the permanent canine may erupt in the more mesial position. This results in a wide interdental space both mesially and distally (Fig 2a). Ideally, distal orthodontic movement of the canine into an Angle Class I relationship would result in an improved occlusion and correct the flattening of the facial contour,<sup>10,13</sup> allowing the lateral incisor to be replaced by a fixed prosthesis (Figs 2b and 2c).

Extensive bodily movement of a canine, however, can be quite difficult. Reduced anchorage, resulting from the missing lateral incisor and the concavity of the alveolus between the canine and first premolar roots, may limit achieving the ideal canine labial root prominence. In young patients these considerations, together with the general desire to avoid a fixed prosthesis, often leads to the closing of the space toward the mesial.<sup>8</sup> A canine in this more anterior position must be reshaped in an attempt to emulate a lateral incisor. Unfortunately, the esthetic result of such treatment may be compromised because of incompatibility of the color and size between the two teeth. It may also result in an unrestored flattening of the facial contour (Fig 3).

If orthodontic treatment is indicated, a decision must be made to either open a space for the lateral incisor or close the space toward the central incisor. The decision will be influenced by the position of the canine as well as the overall occlusion. Patients with severe malocclusion requiring extraction of permanent teeth, or those with canines that have erupted in proximity to the central incisors, are best treated by space closure. However, the absence of a malocclusion with the presence of an Angle Class I occlusal relationship favors treatment by orthodontic space opening and the replacement of the lateral incisor with a fixed prosthesis<sup>10,11</sup> (Fig 2c).

When orthodontics is impractical, the treatment



**Fig 3** Canines have been positioned mesially and reshaped to resemble the missing lateral incisors. Note the esthetic compromise resulting from color differences and size discrepancies. (Courtesy of Stavros Papaconstantinou.)

of choice may be the placement of a fixed partial denture from the canine to first premolar. The edentulous space is filled with a canine pontic, and the natural canine is contoured as a lateral incisor<sup>11</sup> (Figs 4a and 4b). This approach may still be problematic, since extensive reduction of the canine is necessary and may require intentional endodontic therapy. Moreover, the large cervical circumference of the canine often precludes simulation of the cervical form of a lateral incisor.

All such situations require careful diagnosis and treatment planning. Poorly designed fixed partial dentures can lead to a result that is compromised both esthetically and biologically. Preparatory procedures include diagnostic waxing and the placement of a well-designed provisional restoration that permits evaluation of the intended form prior to fabrication of the final prosthesis.<sup>14</sup>

### Congenitally Missing Canine

The canine teeth have a major impact on both esthetics and function. The prosthodontic difficul-



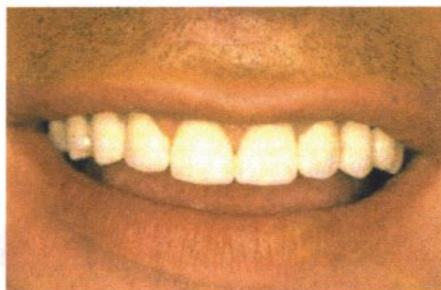
**Fig 4a** Pretreatment condition. The canine is in a mesial position and two premolars have previous restorations.



**Fig 4b** Prosthetic treatment with a fixed partial denture from canine to the second premolar. A third premolar is cantilevered distally. The edentulous space has been filled with a canine pontic, while the natural canine has been shaped as a lateral incisor.



**Fig 5a** Pretreatment condition with congenitally missing canines. Previous treatment had restored the canine with a cantilever fixed partial denture from a double abutted lateral and central incisor.



**Fig 5b** Treatment with conventional fixed partial dentures from lateral incisor to first premolar. The central incisors are restored with single crowns. Note that adequate lip support has been established.

ties imposed by their absence presents a major problem. When this esthetic cornerstone is missing, there is a flattening of the arch contours, reflected in reduced support for the overlying facial structures.

Cantilevering a canine pontic is often not the best solution, as the pronounced occlusal forces placed on the canine must be borne by the adjacent teeth. The treatment of choice is frequently the use of

abutments bordering the edentulous space. This approach improves periodontal support, but the interproximal embrasures must be developed to provide for proper plaque control (Figs 5a and 5b).

A major problem results when congenitally missing canines are accompanied by the absence of several other missing teeth (oligodontia). In such instances there is a general collapse of the occlusion and loss of vertical dimension. The few remaining

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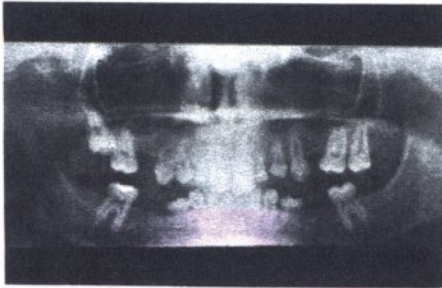
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**Fig 6a** Patient with oligodontia. In the maxillary arch, both canines and the left lateral incisor are missing. In the mandibular arch both canines, both central incisors, and the right lateral incisor are missing.



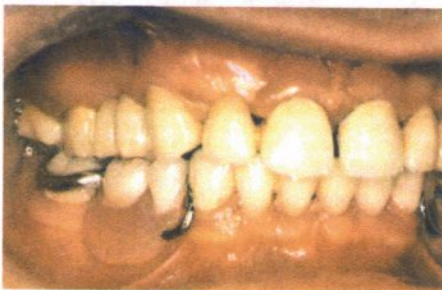
**Fig 6b** Reconstruction in the maxillary arch involved two four-unit fixed partial dentures extending from the central incisor to first premolar. In the mandibular arch, the only permanent anterior tooth present is the left lateral incisor. Cross arch stabilization was provided by splinting the two premolars and first molar bilaterally.



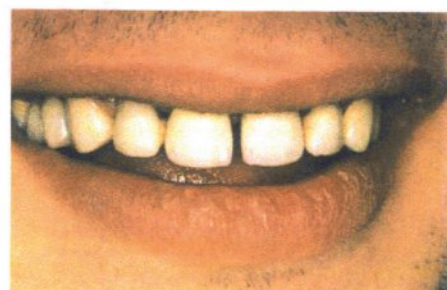
**Fig 7a** Panoramic radiograph of a patient with severe oligodontia. In the mandibular arch, the only permanent teeth present are the first molars. In the maxillary arch, the permanent canines have erupted distal to the primary canines.



**Fig 7b** Intraoral appearance.



**Fig 7c** Posttreatment (orthodontic-prosthetic) result. The vertical dimension of occlusion has been increased. The maxillary arch was reconstructed with two six-unit fixed partial dentures extending from the central incisors to the first molars. In the mandibular arch, the deciduous canines were used as abutments for a fixed partial denture, and two posterior teeth were replaced with a removable partial denture.



**Fig 7d** Patient's smile after treatment.

deciduous and permanent teeth may not allow maintenance of a stable occlusion, and significant attrition can occur (Fig 6a). Oral rehabilitation for such patients is possible only if there are sufficient permanent teeth to provide anterior and posterior support. On occasion, otherwise inadequate support can be compensated by the use of multiple abutment teeth and cross arch stabilization (Fig 6b). There must be an adequate clinical crown length to provide the necessary retention, and the patient must be able to accommodate the altered vertical dimension. Such changes should first be evaluated with a removable occlusal overlay and then verified with the provisional restoration.

### Misplaced Canines

Patients with oligodontia may present with the canine erupted in an abnormal distal position as a result of the presence of deciduous teeth. This again results in unsatisfactory esthetics, abnormal occlusion, and inadequate facial support (Figs 7a and 7b). Orthodontic movement of the canine to a normal position would be the treatment of choice. However, the extensive bodily movement of a canine can be complicated and time consuming as a result

of the reduced anchorage offered by the few remaining teeth (Figs 7c and 7d).

### Partial Anodontia and Cleft Palate

Cleft palate patients may present severe occlusal disturbances because of congenitally missing or malpositioned maxillary teeth, resulting in abnormal occlusal contacts and retrusion of the maxillae with a pseudo Class III maxillomandibular relationship. Most of these patients are best treated by a maxillary overdenture that can correct the occlusion, properly support the facial structures, and obturate the maxillary defect (Figs 8a to 8c).

On occasion, however, orthognathic surgery can bring the maxillae into a proper relationship to the mandible, allowing restoration with fixed partial dentures to replace the missing teeth (Figs 9a to 9c).

### Summary

Patients with congenital partial anodontia present a complex and challenging prosthodontic problem. When fixed prostheses can be used, one must be prepared to face many clinical difficulties. Nonetheless, the possibility of using fixed partial dentures



**Fig 8a** Congenital partial anodontia combined with a cleft palate.



**Fig 8b** Retrusion of the maxillae results in a pseudo Class III maxillomandibular relationship.



**Fig 8c** Maxillary overdenture corrects the occlusion and obturates for the maxillary defect.



**Fig 9a** Preoperative condition of a patient combining congenital partial anodontia with cleft lip and palate. Orthognathic surgery has attempted to bring the maxillae into proper relationship with the mandible.



**Fig 9b** Restoration has transformed the canine into a central incisor and the first premolar into a lateral incisor. The extracted first molar has been replaced by a canine pontic and the reverse occlusion of the second molar has been corrected.



**Fig 9c** Patient's smile postoperatively.

should be given consideration. Adequate diagnosis and treatment planning are essential, and treatment may be facilitated by consultation and treatment with other specialists.

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### Literature Abstracts

#### Provisional Fixed Partial Denture Using the New Visible-Light-Polymerizing Resin System

A description of the fabrication of a fixed provisional restoration, using a light-polymerized resin system (Triad), is provided. A diagnostic cast is prepared with missing teeth restored. A clear plastic template is made on a duplicate cast while the original cast is used for gross preparation of abutments. Light-polymerized resin is placed in the template, seated on the preparations, and placed in the Triad unit after trimming. The provisional restoration is strong, dense, color stable, possesses strong margins, and has no monomer to injure tissues. However, it is expensive, has only three shades, and has potential to lock undercuts on prepared teeth.

Dennis YB, Millick SC, Johansen RE. *Clin Prev Dent* 1988;10(3):10-13. **References:** 6. **Reprints:** Dr Yeda B. Dennis, UMDNJ-New Jersey Dental, 100 Bergen Street, Room D603, Newark, New Jersey 07103.—John-Peter Rallo, DDS; Rhonda S. Katz, DDS, Veterans Administration Medical Center, New York, New York

#### A Longitudinal Study Comparing Scaling, Osseous Surgery and Modified Widman Procedures—Results After One Year

Sixteen adult patients with moderate to advanced periodontitis were treated to compare three modalities of periodontal therapy. These included scaling and root planing, osseous surgery, and the modified Widman procedure as reported by Ramfjord and Nissle in 1975. All procedures were performed by a periodontist. Results were compared at 1 year. With 3-month maintenance visits the modified Widman and osseous surgery procedures showed the greatest reduction of probing depths, with pockets of 4 to 6 mm and greater than 7 mm. There was a slight gain of clinical attachment. Scaling and root planing were effective in maintaining attachment levels, but were not as effective as the surgical procedures in reducing pockets.

Becker W, Becker EB, Ochsenbein C, Kerry G, Caffesse R, Morrism EC, Prichard J. *J Periodontol* 1988;59:351-365. **References:** 27. **Reprints:** Dr William Becker, 810 North Wilmot B-2, Tucson, Arizona 85711.—Gary Dickinson, DDS, MS, Albuquerque, New Mexico