

Prosthetic and psychological factors in treating patients with congenital and craniofacial defects

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This article addresses treatment of patients with various types of congenital defects, including partial and total anodontia, hypohydrotic ectodermal dysplasia, dentinogenesis imperfecta, and cleft lip and palate. The psychosocial aspects of these patients and rehabilitation with removable, fixed, and implant-supported prostheses are discussed. The factors to be considered are altered anatomy, lack of teeth or malformed teeth, teeth in abnormal positions, lack of facial growth, and altered arch development. The short- and long-term treatment of patients in these categories is discussed. (J Prosthet Dent 2006;95:392-6.)

Providing maxillofacial prosthetic treatment for patients with congenital and craniofacial defects should not only address physical and functional deficiencies but, ideally, should also evaluate the possible psychological effects of these deformities. Unfortunately, only 20% of cleft palate teams worldwide perform psychological assessments for these patients.¹ This portion of the treatment evaluation is often overlooked or ignored and should be integrated into the overall treatment. The purpose of this article is to illustrate that both physical and psychological factors should be considered when treating congenital and craniofacial patients.

PSYCHOLOGICAL TREATMENT CONSIDERATIONS

The treatment of patients with congenital craniofacial defects presents psychosocial as well as technical challenges. In the general population, physical attractiveness contributes to a positive self-concept and social well-being.² The research of social psychologists emphasizes the cultural importance of physical appearance, particularly in the development of interpersonal relationships.³ Among American youth, self-perceptions of appearance are inextricably linked to level of self-esteem, and cultural and media messages emphasize appearance as essential to popularity.⁴ Other psychologists describe the self-fulfilling nature of social stereotypes: appearance forms the basis for responses and impressions by others, which then influence individual behavior.^{5,6} Research has shown that global self-esteem in children and adolescents is highly determined by assessment of one's own physical presentation, as well as comparisons with the attractiveness, ability, intellectual skills, and social acceptance of other people.⁷

Unusual facial features exacerbate the social challenges of meeting new people and getting along with others, particularly in middle and high school years.⁸ Lowered self-esteem, speech defects, decreased academic performance, and social isolation may result from merely "looking different" from one's peers. These factors can contribute to inappropriate acting out and impaired social interactions.⁹ These patients must contend with stereotypes that correlate decreased intelligence with facial abnormalities. As a result, individuals may become less confident in actual ability and question self-worth, which can become a self-fulfilling prophesy of failure.

Other longitudinal research of children with cleft lip, cleft palate, and other craniofacial abnormalities suggests that these children develop in a typical manner and do not experience psychological problems.¹⁰⁻¹² Children with a strong family support system and positive peer relationships demonstrate fewer psychological problems. A significant percentage (30%-40%) of children with craniofacial abnormalities, however, experience difficulties with internalizing (shyness, depression, and social isolation) and externalizing (disobedience, fighting, and impulsive behavior) problems, learning disorders, and social competence.¹⁰ These individuals may develop coping mechanisms to reduce social interaction and avoid scrutiny, including teasing, belittling, and other negative social contacts.

In many cultures, children's attitudes towards facial disfigurement result in a negative general perception of those afflicted with craniofacial disfigurement.^{13,14} Japanese children with cleft lip and palate, aged 7 to 9 years, feel anxiety and fear toward their parents and rarely view their homes as restful places.¹⁵ Chinese adults with cleft lip and cleft palate reported significantly more social anxiety than unaffected siblings and control subjects; these individuals may be more disadvantaged with respect to social affiliation and adaptation than unaffected adults.¹⁶

It is critical to discuss with each patient the expectations of treatment outcomes, and the patient must

Presented at the Annual Meeting of the Academy of Prosthodontics, April 2004, Niagara Falls, Ontario, Canada.

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Fig. 1. Pretreatment frontal view.



Fig. 2. Frontal view of definitive prosthesis.



Fig. 3. Smile line provided by definitive prosthesis.

have a realistic understanding of treatment length, process, and effort necessary to achieve treatment goals. The patient must take an active role in treatment decisions and be an involved participant in his or her care. If the patient would benefit from and be receptive to psychotherapy, then the appropriate referral should be made. Wiens et al¹⁷ summarized the psychological conditions that may be encountered in the maxillofacial prosthetic patient.

When medical and dental interventions improve the appearance and function of a patient with congenital and craniofacial defects, this can have a profound effect on the individual's happiness and productivity. Implant-supported fixed and removable prostheses, overdentures, and traditional fixed and removable prostheses can provide more normal facial contours, an improved smile line, improved arch relationships, and improved function for teens and young adults with facial defects. Implant-supported prostheses can enhance stability, retention, function, and bone preservation.

The authors have observed that patients with congenital craniofacial defects often feel more positive about themselves after prosthetic treatment. Patients

embarrassed by their teeth and facial appearance are frequently less motivated to maintain good oral hygiene or seek regular dental care, resulting in increased tooth loss and destruction of oral tissues; this exacerbates an existing problem. Early intervention can be extremely beneficial for the patient's well-being.

PHYSICAL AND FUNCTIONAL TREATMENT CONSIDERATIONS

The authors have observed over the years that patients with partial anodontia, cleft lip and palate, amelogenesis imperfecta, dentinogenesis imperfecta, ectodermal dysplasia, and neurological defects frequently demonstrate physical anomalies. These anomalies include but are not limited to decreased vertical dimension of occlusion, decreased facial support, temporomandibular joint symptoms, lack of functional occlusion, altered speech, poor esthetics, teeth sensitivity due to abnormal wear and abrasion, lack of a normal smile line, and altered anatomy in the lower third of the face. These patients often require a combination of dental and medical specialists to improve these functional and esthetic problems. Maxillofacial prosthodontic treatment offers improvement in appearance, function, and health of patients with congenital and craniofacial defects.

When evaluating a patient with congenital abnormalities, the initial steps involve inspection of appropriate occlusal vertical dimension (OVD). Insufficient OVD may be secondary to lack of teeth, abraded and worn teeth, altered anatomy intraorally and extraorally, or inadequate arch development. For example, an 18-year-old boy presented with partial anodontia with no prosthetic replacements. Figures 1, 2, and 3 illustrate the use of a maxillary overdenture and a mandibular removable partial denture to restore OVD, function, and esthetics. No teeth were reduced, nor was root canal treatment provided, prior to maxillofacial prosthetic fabrication. The patient related that he was often teased



Fig. 4. Pretreatment frontal view.



Fig. 5. Pretreatment frontal view without removable prosthesis.



Fig. 6. Frontal view, definitive prosthesis.

and ridiculed in high school due to his appearance. Following prosthetic treatment, he was leaving for college with renewed self-confidence. Many variables determine the appropriate OVD to restore functional occlusion and facial support for each patient. These processes include an evaluation of speaking space, interocclusal distance, facial contours, lip contours, speech, condition of remaining teeth, and occlusion. Mounted diagnostic casts, detailed oral examination, periodontal evaluation, and a full series of periapical radiographs, panoramic radiographs, and cephalometric radiographs are necessary for a thorough evaluation. A thorough assessment evaluates the need for periodontal care, endodontic treatment, orthodontic treatment, oral and maxillofacial surgery, or plastic surgery either prior to or during the maxillofacial prosthetic treatment. Other factors such as work and/or family commitment may contribute to the course of prosthetic and other treatments selected. Treatment such as orthognathic surgery, bone grafts, and orthodontics, which would require more treatment time, may not be possible options. To illustrate, a 27-year-old man presented with

an inadequately repaired cleft lip and palate. The patient desired only prostheses to improve his situation as much as possible. The patient believed that a better facial appearance could enhance his employment opportunities. Extraction of retained primary teeth, root canal treatment of the maxillary right and left central incisors, and periodontal surgery to reduce the incisal height of premaxilla were performed prior to providing a prosthesis. A maxillary combined removable partial denture was fabricated (Figs. 4, 5, and 6).

Provisional restoration with either fixed or removable prosthetics, if possible, provides the patient time to adjust to the changed OVD, facial support, and function. Even provisional improvements may give the patient resolve to complete treatment and an idea of the definitive outcome. The patient and clinician can then determine if the patient has the ability to tolerate these functional and esthetic changes by evaluating temporomandibular symptoms, possible muscle soreness, or changed facial contours prior to committing to the definitive prosthetic treatment.

For some patients, it may be better to consider a more expedient treatment that obtains a high degree of success, such as an overdenture, versus a long-term complicated treatment involving multiple procedures and increased expense during the critical development phase of adolescence or young adulthood. The more expedient treatment can give an individual more immediate esthetic, functional, and psychological support. For example, a 15-year-old girl presented with a cleft lip and palate with collapsed OVD, inadequate facial support, poor esthetics, and related severe psychosocial problems. The primary teeth were extracted and root canal treatment completed on the right and left maxillary incisors prior to prosthetic treatment. A maxillary overdenture was fabricated. The patient related that she hated to smile and did not like going to school because she was ridiculed. After treatment, the patient became more socially outgoing and enjoyed school and friends



Fig. 7. Posttreatment view of maxillary arch.



Fig. 8. Frontal view, definitive prosthesis.

(Figs. 7 and 8). Often a combination of fixed, implant-supported, and removable prostheses in conjunction with other dental and medical treatment may be necessary to obtain the maximum ideal outcome for the patient. Maxillofacial prosthetic treatment allows these patients to feel more normal, and to have better self-esteem, more opportunity to fulfill their potential socially, and improved employment possibilities.

DISCUSSION

In 1993, the American Cleft Palate Association stated parameters of evaluation and care.¹⁸ The important long-term outcome in the treatment of children with craniofacial anomalies is a functionally habilitated young adult with acceptable speech, appearance, mastication, and educational attainment, who is psychologically well adjusted. To achieve this goal, cleft and craniofacial teams must provide both medical and psychological intervention on a regular basis to families in need of these services.¹⁸

Since only 20% of cleft teams worldwide perform a psychological assessment for patients,¹ it is likely that the

prevalence of psychological problems is higher than the literature suggests. To maximize the chances of a positive outcome in the care of cleft-afflicted individuals, patients who are concerned about appearance or who have experienced psychosocial problems must be identified by the cleft team. If psychological issues such as depression, poor self-image, and low self-esteem are expressed by patients with congenital and craniofacial defects during the team evaluation, referral to a licensed clinical psychologist may be appropriate. Psychological testing, which may include use of the Children's Depression Inventory Manual,¹⁹ Beck Depression Inventory II Manual,²⁰ and Multi-Dimensional Self-Concept Scale Examiner's Manual,²¹ may provide indications of the level of distress experienced by the patient, and whether a psychotherapy referral would be appropriate. Interventions such as counseling or social interaction skills training should be offered so that the patient's self-esteem and social self-confidence can be improved.¹

In addition to the influence of family dynamics, educational, and vocational factors on the social development and rehabilitation of patients with congenital and craniofacial defects, psychological problems are also experienced by these individuals. Correcting the physical deformities with a multispecialty treatment is critical. However, psychological evaluation and treatment is an integral part of the overall rehabilitation as well.

SUMMARY

Persons with a congenital or craniofacial defect are unique, and oral problems must be evaluated individually to the most ideal treatment(s). The changes in appearance, function, and psychological well-being have an enormous impact on patients' personal lives and are rewarding for the maxillofacial prosthodontist providing this care.

REFERENCES

1. Turner SR, Rumsey N, Sandy JR. Psychological aspects of cleft lip and palate. *Eur J Orthod* 1998;20:407-15.
2. Diener E, Wolsic B, Fujita F. Physical attractiveness and subjective well-being. *J Pers Soc Psychol* 1995;69:120-9.
3. Hatfield E, Sprecher S. *Mirror, mirror: the importance of looks in everyday life*. Albany (NY): State University of New York Press; 1985. p. 199-231.
4. Harter S. Is self-esteem only skin-deep? The inextricable link between physical appearance and self-esteem. *Reclaim Child Youth* 2000;9:133-8.
5. Bersheid E, Walter E. Physical attractiveness. In: Berkowitz L, editor. *Advances in social and experimental psychology*. New York: Academic Press; 1974. p. 157-215.
6. Harter S. *The construction of the self: a developmental perspective*. New York: Guilford Publications; 1999. p. 315-43.
7. Harter S. Processes underlying the construction, maintenance and enhancement and self-concept in children. In: Suls J, Greenwald R, editors. *Psychological perspectives on the self: the self in social perspective*. Hillsdale (NJ): Lawrence Erlbaum Associates; 1993. p. 137-81.
8. MacGregor FC. Facial disfigurement: problems and management of social interaction and implications for mental health. *Aesthetic Plast Surg* 1990; 14:249-57.

9. Pope AW, Ward J. Factors associated with peer social competence in preadolescents with craniofacial anomalies. *J Pediatr Psychol* 1997;22: 455-69.
10. Endriga MC, Kapp-Simon KA. Psychological issues in craniofacial care: state of the art. *Cleft Palate Craniofac J* 1999;36:3-11.
11. Slifer K, Beck M, Amari A, Diver T, Hilley L, Kane A, et al. Self-concept and satisfaction with physical appearance in youth with and without oral clefts. *Child Health Care* 2003;32:81-101.
12. Persson M, Aniansson G, Becker M, Svensson H. Self-concept and introversion in adolescents with cleft lip and palate. *Scand J Plast Reconstr Surg Hand Surg* 2002;36:24-7.
13. Harper DC. Children's attitudes to physical differences among youth from Western and non-Western cultures. *Cleft Palate Craniofac J* 1995;32: 114-9.
14. Chigier E, Chigier M. Attitudes to disability of children in the multicultural society of Israel. *J Health Soc Behav* 1968;9:310-7.
15. Kasuya M, Sawaki Y, Ohno Y, Ueda M. Psychological study of cleft palate children with or without cleft lip by kinetic family drawing. *J Craniomaxillofac Surg* 2000;28:373-9.
16. Berk NW, Cooper ME, Liu YE, Marazita ML. Social anxiety in Chinese adults with oral-facial clefts. *Cleft Palate Craniofac J* 2001;38: 126-33.
17. Wiens J, Wiens R, Taylor T. Psychological management of the maxillofacial prosthetic patient. In: Taylor TD, editor. *Clinical maxillofacial prosthetics*. Chicago: Quintessence; 2000. p. 1-13.
18. American Cleft Palate Craniofacial Association. Parameters for evaluation and treatment of patients with cleft lip/palate or other craniofacial abnormalities. *Cleft Palate Craniofac J* 1993;30:S1-16.
19. Kovacs M. Children's depression inventory manual. Toronto: Multi-health Systems, Inc; 1992.
20. Beck A, Steer RA, Brown GK. Beck depression inventory II manual. San Antonio (TX): PsychCorp; 1996.
21. Bracken B. Multi-dimensional self-concept scale examiner's manual. Austin (TX): Pro-Ed Inc; 1992.

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0022-3913/\$32.00
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doi:10.1016/j.prosdent.2006.03.002

Noteworthy Abstracts of the Current Literature

The impact of conventional and implant supported prostheses on social and sexual activities in edentulous adults: Results from a randomized trial 2 months after treatment

Heydecke G, Thomason JM, Lund JP, Feine JS. *J Dent* 2005 Sep;33: 649-57.

Objectives: To determine the impact of mandibular two-implant overdentures or conventional complete dentures on leisure and sexual activities.

Methods: One hundred two subjects, aged 35-65 years, received either mandibular overdentures retained by two implants (IOD; n=54) or new mandibular conventional complete dentures (CD; n=48) in a randomized controlled clinical trial. A Social Impact Questionnaire was used to assess the impact on social and sexual activity including avoiding conversation, refusing invitations, avoiding sport and feeling uneasy when kissing and in sexual relationships, and the looseness of the prostheses during such activities. Ratings were recorded on categorical scales at baseline and 2 months after treatment. Oral health related quality of life was measured with the Oral Health Impact Profile (OHIP). Between and within group comparisons were carried out using regression models. The correlation between post-treatment OHIP scores and the leisure and sexual impact items was assessed.

Results: Two months after delivery of the prosthesis there were significant improvements in the IOD group for looseness when eating, speaking, kissing and yawning. The IOD group reported significantly less post-treatment looseness than the CD group for all parameters investigated ($P<.0001$). IOD subjects felt less uneasy while kissing and less uneasy during sexual activity than CD subjects. Correlations between the two sexual activity items (uneasiness when kissing and during sexual relations) and the OHIP scales were weak.

Conclusions: Edentulism has a negative impact on social and sexual life. Mandibular overdentures provide greater improvement in unease in intimate activities than new conventional mandibular dentures.—*Reprinted with permission of Elsevier Inc.*