

Letters to the Editor

Autotransplantation for failing and missing anterior teeth

Peter Day¹ • Monty Duggal²

Dear Editor,

We must congratulate the journal and the authors for publication of a case report of autotransplantation (Rao J, Fields HW, Chacon GE. Case report: Autotransplantation for a missing permanent maxillary incisor. *Pediatr Dent* 2008;30:160-6). This is a well established procedure in Europe where premolar transplantation dates back to the 1960s. We find autotransplantation of premolars a very important treatment option for children with failing and ankylosing anterior teeth following trauma and have also used it in cases of dilacerations, hypodontia and pathological root resorption following ectopic unerupted canines.

This treatment option unfortunately seems to have disappeared off the list that pediatric dentists consider when faced with these clinical scenarios. Restorative dentists rely increasingly on the use of implants upon completion of growth with temporary restorations to tide the child through the period of growth. It should not be assumed, however, that implants are always the best restorative option and a number of long term studies (as reviewed by Zachrisson¹) have shown that their use in the anterior maxilla suffers from a number of problems which can lead to poorer esthetics than we imagine. These include: poor gingival contour with blue gingival discoloration, progressive infraocclusion and "root" exposure. They are also expensive to provide and maintain and frequently require additional bone grafting which adds to the complexity and reduces the success rates.²

Transplants when provided within an interdisciplinary team can be a highly successful long term option with a good esthetic outcomes.^{3,4} As pediatric dentists, we see a large proportion of children suffering from dental trauma and are proficient in its management. For us, a transplant is simply a controlled avulsion. In addition, the surgery is frequently best carried out by pediatric dentists as we understand the need for gentle handling of the periodontal ligament to prevent adverse outcomes. Transplants are a biological solution for a missing anterior maxillary tooth as they will induce bone into the area, have a good gingival contour, can be moved into a better position with orthodontics, and can be expected to last as long as any other tooth. Most importantly they provide a

definitive solution while the child is still growing, therefore avoiding some of the difficulties of trying to temporize missing teeth in the anterior maxilla.

In our experience we would advise a number of modifications described in the case report to enhance the long term success of the procedure. These include:

1. using a single rooted premolar which is easier to extract. Therefore less damage is caused to the periodontal ligament (PDL) and cementum. In addition only one root needs to revascularize, and if it becomes non vital it is easier and less time consuming to provide endodontic treatment.
2. waiting until the premolar to be transplanted has erupted into the mouth to minimize any damage to the PDL during its removal.
3. use of hand instruments to prepare the donor socket wherever possible to minimize any thermal damage caused to the bone.
4. delaying transplantation until the root length of the donor tooth is complete but with an open apex in order to minimize any complications if there is no further root growth⁵ as shown in the case reported. This tooth will now have a reduced root crown ratio with a poorer long term tooth survival, which will be exacerbated further by root resorption associated with orthodontic movement.⁵
5. recommending little or no tooth preparation of the transplant to reduce the risk of pulpal necrosis in cases in which pulpal revascularization is the likely outcome. It is often possible to use composites with no tooth preparation to achieve an acceptable esthetic outcome in the short to medium term before definitive orthodontic treatment is undertaken to include the optimal position for the transplant.
6. use of a simple composite wire trauma splint for 7-10 days similar to avulsion guidelines. The importance of keeping the area clean to facilitate gingival healing cannot be underestimated and this we have found difficult to achieve with suture splints.

Reference List

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¹Peter Day is a Lecturer and Specialist Registrar in Paediatric Dentistry, and ²Monty Duggal is a Professor of Child Dental Health; both at the Leeds Dental Institute, Leeds, UK.

2. Andreasen JO, Odman J, Hammerle C, Buser D, von Arx T, Jensen J et al. Implants in the Anterior Region. In: Andreasen JO, Andreasen FM, Andersson L, editors. Textbook and Color Atlas of Traumatic Injuries to the Teeth. 4th ed. Oxford: Blackwell Munksgaard; 2007. 761-97.
3. Czochrowska EM, Stenvik A, Bjercke B, Zachrisson BU. Outcome of tooth transplantation: survival and success rates 17-41. Am J Orthod Dentofacial Orthop 2002;121:110-9.
4. Czochrowska EM, Stenvik A, Zachrisson BU. The esthetic outcome of autotransplanted premolars replacing maxillary incisors. Dental Traumatol 2002;18: 237-45.
5. Paulsen HU, Andreasen JO, Schwartz OA. Pulp and periodontal healing, root development and root resorption subsequent to transplantation and orthodontic rotation: A long term study of autotransplanted premolars. Am J Orthod Dentofacial Orthop 1995;108: 630-40.

Response to letter from Day

Jahnvi Rao, DDS, MS¹ • Henry Fields, DDS, MS, MSD²

Dear Editor:

We are pleased that Drs. Day and Duggal found our article informative and endorsed the concept of the underutilized procedure of autotransplantation for treatment in the U.S. We thank them for their comments.

We attempted to discuss well documented techniques in the paper. Drs. Day and Duggal suggest that some less well documented modification may enhance results. Some appear to be based largely on their experience. Our reading of the same literature brought different conclusions (Andreasen JO, Paulsen HU, Yu Z, Ahlquist R, Bayer T, Schwartz OA. A long term study of 370 autotransplanted premolars. Parts I-IV. Eur J Orthod 1990;12:3-50). We found no indication that teeth other than first premolars provided better results in terms of resorption or pulpal healing due to the ease of extraction. Further, Andreasen et al stated that more fully developed and erupted teeth would require more manipulation and thus more damage to the periodontal ligament. To the point of using hand instruments, the surgical procedure described in the referenced article used burs to prepare the recipient site.

Zachrisson and Mjor, in their classic study that histologically examined teeth recontoured by grinding with diamonds and abundant water cooling, found "no or only minor pulp and dentin reactions" which were transient. (Zachrisson BU, Mjör IA. Remodeling of teeth by grinding. Am J Orthod. 1975;68:545-53).

Finally, the Andreasen paper also noted that splinting methods had no effect on resorption of the transplanted tooth, but that the fixation method did have a statistically significant impact on pulpal necrosis with suture stabilization demonstrating the fewest negative consequences.

¹Dr. Rao, in a private practice of pediatric dentistry, Las Vegas, Nev.; and ²Dr. Fields, is a professor and head, Section of Orthodontics, Ohio State University College of Dentistry, Columbus, Ohio.

We hope investigators continue to advance the science associated with autotransplantation and find this a useful clinical procedure.

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Richard W. Valachovic

To the Editor:

I enjoyed reading the article entitled, "Advocacy Training in US Advanced Pediatric Dentistry Training Programs," in the March-April 2008 issue of *Pediatric Dentistry*. The American Dental Education Association (ADEA) also embraces the imperative that dental educators, students, and practitioners must be engaged in advocacy at both national and state levels if the oral health of the nation is to be enhanced.

I was pleased to see that the ADEA website was visited by two-thirds of the respondents (twice as much as the other listed websites) in the survey. This is an encouraging sign that ADEA's efforts to expand our advocacy are succeeding, particularly among pediatric dental residency program directors. One of the most popular items we post to the website is the *ADEA Washington Update*, a monthly legislative newsletter prepared by ADEA's Center for Public Policy and Advocacy. The newsletter is available to members and anyone who wants to stay abreast of current public policy and Federal legislative initiatives with regard to oral health and dental education.

Our newly-initiated AADR/ADEA Field Advocacy Workshops provide another venue for pediatric dental residency program directors, faculty and students to enhance their advocacy leadership skills and increase their influence with policy makers. The workshops are hosted by academic dental institutions which frequently invite the participation of the institution's government affairs staff, the state dental association and other organizations in the local community. The agenda features timely presentations on the political environment, the Federal legislative process, and the essentials of effective advocacy. Specific issues of current importance to the oral health community at Federal and state levels are identified and studied; and workshop participants are invited to advocate for these issues. The workshops are extremely valuable to individuals who are interested in advocacy but are not able to attend the advocacy sessions ADEA conducts in Washington,

DC. To facilitate the advocacy efforts of our fifty-eight dental schools the deans have selected ADEA Volunteer Advocacy Coordinators to serve as the focal point for coordinating advocacy activities.

Some of ADEA's strategic partners, including the National Dental Association, the American Academy of Public Health Dentistry, the Association of State and Territorial Dental Directors, and Special Care Dentistry have utilized the expertise of ADEA's public policy staff by hosting their own advocacy workshops. Annually, ADEA jointly hosts the AADR/ADEA Advocacy Day on Capitol Hill and the ADEA/ASDA National Dental Student Lobby Day. Other ADEA-sponsored workshops include the ADEA Leadership Institute Legislative Workshop and legislative training for ADEA diversity officers and leaders.

The article suggests, most advocates are born out of personal motivation and interest. But a strong leader who possesses all the necessary attributes to be a great advocate is still but one voice. To significantly influence the formulation of public policy and educate elected officials the advocacy message of that one voice must be broadcast through a larger, unified and more powerful channel. ADEA's goal is to create that channel by developing a cadre of knowledgeable and articulate advocacy leaders speaking as one and seeking solutions to important oral health issues of our time. For more information about ADEA's advocacy efforts contact: Mr. Jack Bresch, ADEA Associate Executive Director and Director of the Center for Public Policy and Advocacy (CPPA) at phone: (202) 289-7201 ext. 169 or by e-mail: Bresch@adea.org.

We welcome pediatric dental educators, students, and dentists to join us in this effort.

Sincerely yours,

Richard W. Valachovic, DMD, MPH
Executive Director, ADEA

Erratum

Regarding the article entitled "Regeneration potential of the young permanent tooth: What does the future hold?" (*Pediatr Dent* 2008;30:253-60): The second author's name was misspelled as "Giesler" in the manuscript provided to the journal. The correct spelling is "Geisler." The journal regrets the error.