Letters

Crowding: timing of treatment

In his article, Crowding: timing of treatment (Angle Orthod 1994;64:415-418) Dr. Anthony Gianelly states that the late mixed dentition is a favorable time to start treatment to resolve crowding, and I would certainly agree. However, he quotes the Lutz and Poulton study (1985) incorrectly. The treated cases came from a study done at UCSF; I was involved with that study from the time it started in 1970. Dr. Jim McInaney treated ten cases and investigated early arch expansion with Crozat appliances. He was never consulted during preparation of the paper nor was he given credit for the case material. One case was treated with a Schwartz and two cases were treated with fixed appliances by Dr. Rod Matthews. The language of the article is confusing, but I believe it states that follow-up studies showed that the mean of the permanent lower canine width was 5.8 mm greater in the treated cases than in the control cases. This is well outside the norm and was stable. All the controls needed subsequent treatment and most had bicuspids removed. None of the treated cases were extracted to finish, and some of the treated cases did not even need phase II treatment.

Another study, by McInaney et al. (1980), used 22 similar cases, and I still have those records. In both studies, the A-P Dimension from the mesial of the first permanent molars to the central incisors (arch depth) did not increase between the start of treatment and after all permanent teeth were in place; most of the time it decreased. Arch width increase in the first bicuspid region accounted for almost as much increase in arch length at the final evaluation as did cuspid expansion.

It was our belief that the Crozat acted as a prosthetic functional matrix to affect muscle function as a result of the widened arches. In practice, we held the expanded arch form until the second primary molars were exfoliated. We then found the permanent dentition was well beyond norms that had been reported by previous investigators.

Sincerely, Jack L. Hockel,
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Author's response

I read Dr. Hockel's letter with great interest, particularly because he was involved with the study that produced the data described by Lutz and Poulton[1] which I used in my article, "Crowding: timing of treatment." He stated that I incorrectly quoted the study. He did not indicate the discrepancy, so I will assume it concerns the conclusions of the article.

I recorded that Lutz and Poulton noted that mandibular intercanine expansion gained by appliance therapy in the group of patients they examined was not stable. Two of their statements were: "According to these numbers, widening of the lower arch between the cuspids has no permanent effect." (pages 306-7) and, "Cuspid width after expansion tended to decrease when the retention was terminated, and was then similar to the cuspid width in the control group."(page 312).

I also used Figures 8, 9, and 10 for my conclusion. Figure 8 depicts the behavior of the lower intercanine dimension of the treated and control groups. In the treated group, the increase in intercanine dimension was followed by a decrease while the intercanine width of the control group steadily increased to reach the same dimension as the treated group; indicating that there was no net gain with treatment. Figures 9 and 10 are similar findings in individual patients.

In addition, Dr. Hockel wrote: "The language in the article is confusing, but if read correctly, I believe it states that follow-up studies showed that the means of the permanent lower canine width were 5.8 mm greater in the treated cases

than in the control cases." I'm not sure of the article in question. If he is referring to the article by Lutz and Poulton, I could not verify this statement in the text. The only place I could find the number 5.8 mm was in the section describing the forward movement of the lower incisors as determined cephalometrically. In the treated group, they moved 5.8 mm anteriorly (page 305).

If he is referring to my article, I cited the study by McInaney et al.[2] in which the lower intercanine width was increased by approximately 5 mm when expansion was done in the deciduous dentition. The authors noted that this change was stable. However, there were no controls in this study. As indicated by Lutz and Poulton (page 300), "Moorrees[3] and Sillman[4] report that a moderate increase in width of the dental arches can be expected from the deciduous dentition stage until the permanent cuspids erupt, particularly in the anterior region. This natural increase in dental arch width must be subtracted from the total measured amount of therapeutic expansion, with only the remaining amount regarded as an orthodontic widening effect."

With this in mind, I estimated in my article that the orthodontic widening effect noted by McInaney et al. was, at best, 2 to 3 mm. According to Germane et al.[5] this 2 to 3 mm increase in intercanine width would provide only enough space to resolve 1 to 2 mm of crowding since they found that a 1 mm increase in intercanine width provided only a 0.73 mm increase in arch perimeter.

From the last paragraph of Dr. Hockel's letter, one might infer that he believes that expansion of the mandibular dental arch in the primary and/or mixed dentition stage to gain space to resolve crowding is a proper strategy. Propenents of this strategy have the obligation to demonstrate that the expansion is stable over the long term.

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Extraction frequencies

Dr. Proffit's recent paper on extraction frequencies over a 40-year period (Angle Orthod. 1994; 64: 407-415) gives pertinent reasons for this major change. However, there are other reasons which I would like to mention: economic, demographic, and legal. I will elaborate somewhat.

1. Most orthodontists have had the experience of presenting a new patient with the reasons for extraction therapy, in a case where it was definitely indicted, only to receive an ambiguous or negative response from the patient, who is then never seen again. Recently, many practicioners have seen a reduction in the number of new patients they treat per year; some parts of the country being more affected than others. This reduction has placed an economic pressure on many orthodontists, who now feel a need to compete with other specialists and with generalists who advertise their emphasis on nonextraction therapy, which is more appealing to the public.
2. There has been a change in patient population over the past 40 years. In "era one," few people sought care at all. In "era two," we treated, for the most part, severe malocclusions. In the present "era three," even patients with minor malocclusion are seeking care; their numbers increased by third party payments. It is almost axiomatic that the more severe the malocclusion, the greater the probability of extraction. It is significant that Dr. Proffit's bar graph for four first premolar extractions (page 409) shows peak extraction years from 1963 to 1973, followed by an almost linear decline from a high in 1963 to a low in 1993. These last

three decades coincide approximately with what I'm calling eras two and three.

3. Although an attorney might argue that his or her client was injured by nonextraction therapy where it was clearly indicated, a more emotional, damaging, and probably viable case could be made for injury from extraction therapy, especially if the plaintiff is a child. This worry is voiced among colleagues but has never been addressed in print.

Eighty years ago, nonextractionist Edward Angle and extractionist Calvin Case battled bitterly over the unbroken "line of occlusion" versus four premolar extractions. It was, and usually still is, an either/or choice. Given this rigid dichotomy, it may be "safer" in borderline and even not-so-borderline cases to opt for nonextraction, even though the practitioner does not feel it is the optimal treatment.

Dr. Proffit's third bar graph consistently shows little attention given to "other extractions" during the period from 1953 to 1993, with a maximum of 16%. Yet a cursory scan of the literature from 1991 through 1994 reveals several papers on atypical extraction patterns: from one to four teeth with numerous combinations other than those of first and second premolars.[1-16] Because no tooth, even a canine, is sacrosanct, there are infinite possibilities. More creative diagnostic thinking is indicated.

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Author's response

Dr. Valinoti's further comments regarding the changes in extraction frequency in recent years are certainly valid extensions of my thoughts about why this has occurred. I do think, however, that the focus of the paper should not be lost in generalizations about extraction versus nonextraction. The change has occurred primarily, indeed almost totally at UNC, in the number of patients who have four first permolars extracted. Even with the decline in this once favored extraction pattern, about one patient in three or four still requires extraction of some tooth or teeth for the best treatment. It is indeed appropriate to extract when that is indicated, and perhaps it is a sign of professional maturity that now there is relatively more variability in the extraction pattern than there was not so long ago.

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