Letters

Cephalometry needs innovation

After reading Dr. Pae's brief communication, Cephalometry needs innovation, not renovation (67(5):395-396), I have refocused my expectations from cephalometric headfilms.

For 20 years I have asked why the changes brought about by skeletal functional appliances cannot be shown on cephalometric headfilm tracings. Is the mastoid bone position being changed by the functional appliance? That would move the glenoid fossa down and forward and contribute to clinical changes.

So far I have found no way to detect mastoid bone movement, although I believe it does occur. As far as I know, no student or researcher has been able to disprove my contention. So, until I read Dr. Pae's article, I had accepted that functional appliances cause skeletal changes that cannot be measured on a cephalometric tracing. However, when I have questioned this, I've heard the following explanations for why the changes are hidden in the tracing:

1. Growth of the mandibular condyle
2. Remodeling of the glenoid fossa
3. Maxillary bone repositioning
4. Movement of the maxillary or mandibular teeth in the bone
5. The additive combination of all four factors.

While I may see dramatic results clinically, I do not see the changes on the cephalometric tracing, nor do I see an explanation in the five points above.

I believe that the skeletal changes brought on by functional appliances reinforce Dr. Pae's assertion that a new data system should be developed. As he says, an x-/y-coordinate system that is able to measure one part of the facial structure position with respect to other parts is needed.

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Author's response

Dr. Stepovich's letter made me brood again over a method using x- and y-coordinates.

The so-called "edge-matching technique," originally suggested by Dr. Bookstein, was the method in my mind when I wrote the Brief Communication. This method holds several advantages over conventional cephalometrics. Instead of measuring lengths and angles, a pair of x- and y-coordinates, i.e., scalar measurements with direction, represents each variable. As one treats these coordinates as variables, routine statistical methods can be applied to them. To start the process, an axis is required. This is the trickiest part, as mentioned in the article. A line that connects a pair of homologous landmarks that change least during growth and treatment becomes a baseline. By fixing one of the homologous landmarks at 0,0 and the other at 1,0, the baseline functions as the x-axis of a Cartesian table as well. The positions of other landmarks will be rearranged and represented in terms of x- and y-coordinates with respect to this baseline. Continuing this process on each cephalogram standardizes size and orientation of the face. These measurements in standardized coordinate form are readily convertible to lengths and angles as long as one remembers the original length of the baseline on each cephalogram. My knowledge and experience on functional appliances is limited, yet allows me to suggest an old trick to measure any change of the mastoid process. Finding a good reproducible baseline is the most difficult part of the whole process. I suggest occipital-nasion as a baseline because it is long enough and properly positioned to the mastoid process to observe any changes with ease. Tattoo a spot on the scalp at the occipital protuberance. Take cephalograms with a lead marker on the spot before and after treatment. This edge-matching technique is reported to have a high statistical power in comparison.

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The 1997 Edward H. Angle Research Prize

The winner of the 1997 Edward H. Angle Research Prize is Dr. Robert E. Rosenblum, a member of the North Atlantic Component of the Edward H. Angle Society of Orthodontists.

Dave Turpin presented Robert Rosenblum with the 1997 Edward H. Angle Research Prize.

Dr. Rosenblum practices in Pittsford, New York, is a reviewer for *The Angle Orthodontist,* and has actively pursued his interests in dental research for more years than he likes to recall.

Editor David L. Turpin presented Rosenblum with a plaque and a copy of *The Angle Orthodontist* on CD-ROM at the 32nd Biennial Meeting in Williamsburg, Virginia.

Now it will be much easier for Dr. Rosenblum to search the literature when the next research question raises its head.

The award-winning paper was published as follows: Rosenblum RE. Class II malocclusion: Mandibular retrusion or maxillary protrusion? Angle Orthod 1995;65(1):49-62.