The orthodontic profession is experiencing a new era. The introduction of 3D imaging is revolutionizing orthodontic diagnostic philosophy. This philosophy emphasizes the importance of implementing the prospective treatment analysis concept and its triad of ERA, SA, and TA (End Result Analysis, Subtraction Analysis, and Treatment Analysis). The question is whether we have the armamentarium for this triad and if we are ready for PTA? World J Orthod 2009;10:123–124.

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The orthodontic profession is experiencing a new era, with several exciting developments: (1) the acceptance of evidence-based knowledge that revolutionizes established concepts1–3; (2) the introduction of new biological concepts, such as canine distraction and accelerated osteogenic orthodontics; and (3) the evolution of new elements for the orthodontic armamentarium, including skeletal anchorage systems and self-ligating brackets.

In contrast, little has changed in the area of orthodontic diagnosis for some time. However, with the recent development of virtual 3D models, there is the opportunity to test treatment procedures and visualize them in 3D.

The introduction of cone beam computed tomography (CBCT) made 3D replicas of patients possible (Fig 1). It allows clinicians to evaluate a patient’s hard tissues, including the dentition, as well as the soft tissues. A patient’s skin color can be added to the 3D image with digital photography.

Three-dimensional analysis enables orthodontists to install a complex evaluation system that includes an end-result analysis, which is the outcome anticipated and agreed on by the orthodontist and patient (Fig 2), and subtraction analysis, which is the result of subtracting the end-result analysis from the original virtual image. It represents the amount of work needed (Fig 3).

By implementing end-result analysis and subtraction analysis, orthodontists are able to achieve a prospective treatment analysis approach.4 The treatment can begin with the end in mind. The system also enables patients to visualize their treatment results to ensure their expectations are realistic. At the same time, it helps orthodontists to utilize the available armamentarium to achieve high-quality results.

In the May 2000 issue of the American Journal of Orthodontics and Dentofacial Orthopedics, an excellent compilation of orthodontic pioneers’ opinions was published.5–7 One of these opinions was a forecast for the following 10 years. Now, with just one year remaining before 2010, the question is to what extent the orthodontic community has measured up to the foresight of the leaders of the profession. The honest answer: very little. Therefore, orthodontists must prepare for prospective treatment analysis.

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REFERENCES


Fig 1 Three-dimensional replica of a patient with a severe mandibular retrognathism.

Fig 2 End-result analysis for the same patient.

Fig 3 Subtraction analysis depicting change from original image to the end-result analysis. Green, added volumes; yellow, reduced volumes.