

# CAO 61st Annual Scientific Session

September 10-12, 2009

Delta Grand Okanagan Resort and Conference Centre, Kelowna, BC



CFAO Graduate Student Posterboard Abstracts – Sponsored by



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### A SYSTEMATIC REVIEW OF THE EVIDENCE BEHIND DENTAL ARCH EXPANSION WITH THE DAMON PHILOSOPHY

Hussam Al-Fakir\*, Carlos Flores-Mir  
University of Alberta

**Introduction:** Depending on the purpose of the expansion and the stage of dental development, arch expansion can be done using various conventional expansion appliances; for example, Hyraxes, Quad helixes, Wilson arches and bonded RMEs. However, in recent years, a new philosophy has been developed for the accomplishment of dental arch expansion, involving more bodily movement of the teeth rather than just tipping the teeth.

**Objective:** In this systematic review the evidence behind dental arch expansion with the Damon philosophy was sought.

**Method:** Several electronic databases were searched for relevant articles and reference lists of pertinent articles were also searched.

**Results:** Only two articles were found that fulfilled the minimal set of criteria set in advance. One article had a sample of 19 patients with two groups (9 patients treated with RME expansion then full fixed conventional appliance, 10 patients treated only with the Damon system). The second article had a sample of 54 patients with certain selection criteria then divided randomly into two groups (one treated with conventional appliance and second with Damon system). They found that dental arch expansion is possible with Damon philosophy; however, the expansion is mostly tipping in the premolar and molar area. Arch expansion was measured and quantified using dental cast models and posteroanterior cephalometric radiographs.

**Conclusion:** The amount of research that has been done on this topic is far from sufficient and neither supports nor dismisses the premise. A more precise tool to measure and quantify arch expansion for the whole maxilla is needed.

### ACCURACY OF COMPUTER PROGRAMS IN PREDICTING ORTHOGNATHIC SURGERY SOFT AND HARD TISSUE RESPONSE

<sup>1</sup>Neelambar Kaipatur, DMD, MSc<sup>a\*</sup>, Yousef Al-Thomali BDS, Cert. Ortho<sup>b</sup>, Paul Major DDS, MSc.<sup>c</sup>,  
Carlos Flores-Mir, DDS, DSc, FRCD(C)<sup>d</sup>  
University of Alberta

**Purpose:** The aim of the present systematic reviews is to investigate the accuracy of computer programs in predicting hard and soft tissue responses following orthognathic surgery.

**Materials and Methods:** A systematic computerized database search was conducted using several electronic databases. The reference lists of all the selected articles were also searched for any potential articles that might have been missed in the electronic search and additional information not available through the articles was obtained directly from the source (by contacting the author).

**Results:** Out of the 40 and 79 initially identified articles only 7 and 9 articles fulfilled the final selection criteria for soft tissue and hard tissue changes respectively. All 7 articles, in general, showed accurate prediction outcomes of soft tissue response (less than 2 mm) when compared to actual post surgical results in both horizontal and vertical directions. The most significant area of error in soft tissue prediction was the lower lip. The computer programs were unable to precisely predict all the skeletal changes. Most of the prediction inaccuracies with skeletal changes were within 2 mm/degrees except for Witts analysis possibly due to difficulty in locating the functional occlusal plane on cephalograms.

**Conclusion:** These systematic reviews demonstrated that computer programs cannot consistently predict the skeletal or soft tissue changes following orthognathic surgery but their results may be considered inside a clinically acceptable range. Although the individual errors are almost always minimal (less than 2 mm or degrees); the composite addition of these minimal errors could have clinical implications.

<sup>1</sup>PhD (student), Orthodontic Graduate Program, Department of Dentistry, University of Alberta, Edmonton, Alberta, Canada

<sup>b</sup>Post-Doctoral Fellow, Orthodontic Graduate Program, Department of Dentistry, University of Alberta, Edmonton, Alberta, Canada

<sup>c</sup>Professor and Director, Orthodontic Graduate Program, Department of Dentistry, University of Alberta, Edmonton, Alberta, Canada