

## Field Summary: AJO-DO Effectiveness and efficiency of a CAD/CAM orthodontic bracket system, December 2015

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### Material and Methods

The aim of the study was to expand the existing CAD/CAM orthodontic appliance literature by comparing treatment effectiveness and efficiency of 3 systems: (1) direct bonded self-ligating brackets, (2) indirect bonded self-ligating brackets, and (3) indirect bonded CAD/CAM self-ligating brackets.

- Retrospective study approved by the institutional review board at UNC Chapel Hill
- All patients were treated by the same doctor (Dr. Tim Bandeen), March 2008 – August 2013
- Patients were treated sequentially using 3 bonding protocols
  - Group 1, direct bonded self-ligating (**Damon Q**, 31 patients)
  - Group 2, indirect bonded self-ligating (**Damon Q**, 33 patients)
  - Group 3, indirect bonded self-ligating CAD/CAM self-ligating (**Insignia SL**, 32 patients)

### Results

#### Patient Profiles and ABO Discrepancy (a measure of case complexity)<sup>1</sup>

- ABO Discrepancy Index values were not statistically significant
  - Group 1, 16.0 +/- 9.1
  - Group 2, 15.9 +/- 8.1
  - Group 3, 16.8 +/- 6.5

These ABO Discrepancy values tell us that one group's cases were not significantly more or less complex than the others. It can be inferred that one group's cases would not treat more or less efficiently because of differences in complexity. There was a "level playing field".

#### ABO Cast-Radiograph Evaluation Scores (a model grading system to evaluate finished cases)<sup>2</sup>

- No statistically significant difference was found among the 3 groups
- ABO Cast-Radiograph Evaluation scores were
  - Group 1, 28.5 +/- 8.5
  - Group 2, 32.3 +/- 7.8
  - Group 3, 32.2 +/- 9.3

#### Treatment Efficiency

- Treatment time: mean treatment times (months) **were significantly different** ( $P < 0.05$ ) among the 3 groups
  - Group 1, 21.9 +/- 5.0
  - Group 2, 16.9 +/- 4.1
  - **Group 3, 13.8 +/- 3.4 (36% faster than Damon Q direct bond, group 1)**
- Appointments: mean number of appointments between groups 1 and 3 **were significantly significant** whereas neither groups 1 and 2 nor groups 2 and 3 were found to be significantly different from the other.
  - Group 1, 16.5 +/- 4.0
  - Group 2, 14.9 +/- 3.7
  - **Group 3, 14.1 +/- 3.9 (15% fewer appointments than Damon Q direct bond, group 1)**

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<sup>1</sup> Additional reading on ABO Discrepancy:

[https://www.americanboardortho.com/media/1189/discrepancy\\_index\\_scoring\\_system.pdf](https://www.americanboardortho.com/media/1189/discrepancy_index_scoring_system.pdf)

<sup>2</sup> Additional reading on ABO Cast-Radiograph Evaluation: <https://www.americanboardortho.com/media/1191/grading-system-casts-radiographs.pdf>