

## University of Manitoba

### THE PROCLINATION OF MANDIBULAR INCISORS IN NON-EXTRACTION CROWDED INVISALIGN® CASES

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**Objectives:** Investigate the position of the mandibular incisors in crowded non-extraction Invisalign® patients, with or without interproximal reduction.

**Subjects and Methods:** A retrospective chart review was undertaken on 61 Caucasian non-growing patients (older than 18 years); including 17 males and 44 females. The average treatment time was  $14.50 \pm 4.75$  months. Subjects were categorized into 3 groups based on the value of pre-treatment crowding of the lower dentition; 20 mild (2.0-3.9mm), 22 moderate (4.0-5.9mm) and 19 severe ( $>6.0$ mm). Cephalometric radiographs were digitized and parameters were measured to determine the change in lower incisor position from T0 (pre-treatment) to T1 (post-treatment). Interproximal reduction (IPR) and buccal expansion were recorded as contributing parameters to crowding resolution. Statistical evaluation of T0 and T1 values using paired t-tests and ANCOVA were used to evaluate the changes in the means, as well as a comparison of final lower incisor position to the accepted norms.

**Results:** There was a statistically significant increase in buccal expansion in each of the 3 groups.

Dental changes induced by Invisalign® treatment were statistically significant in the severe group as follows;

1. Lower incisor proclined: (L1-NB  $4.71 \pm 4.79^\circ$ , L1-MPA  $3.95 \pm 4.72^\circ$ , L1-APog  $4.82 \pm 4.94^\circ$   $p < 0.001$ )
2. Lower incisor protruded: (L1-NB  $1.56 \pm 1.40$ mm, L1-APog  $1.74 \pm 1.62$ mm  $p < 0.001$ )

There were no statistically significant differences in lower incisor position between the mild and moderate crowding groups.

**Conclusions:** Invisalign® treatment can successfully resolve mandibular arch crowding using a combination of modalities i.e. buccal arch expansion, interproximal reduction and lower incisor proclination. When there is  $<6$ mm of crowding, lower incisor position remained relatively stable. In more severely crowded dentitions ( $>6$ mm) the lower incisor proclined and protruded to allow for arch alignment.