



## INTRODUCTION

### Backgrounds:

Clear removable thermoplastic aligners (CRTA) have been gaining popularity among adult patients who were more concerned with appearances during their treatment period. However, use of such appliances have been limited for various reasons including poor compliance and certain types of more challenging dental movements such as extrusion and translation. On the other hand, corticotomy procedures have been demonstrated to allow more difficult orthodontic tooth movement in expedited rates.

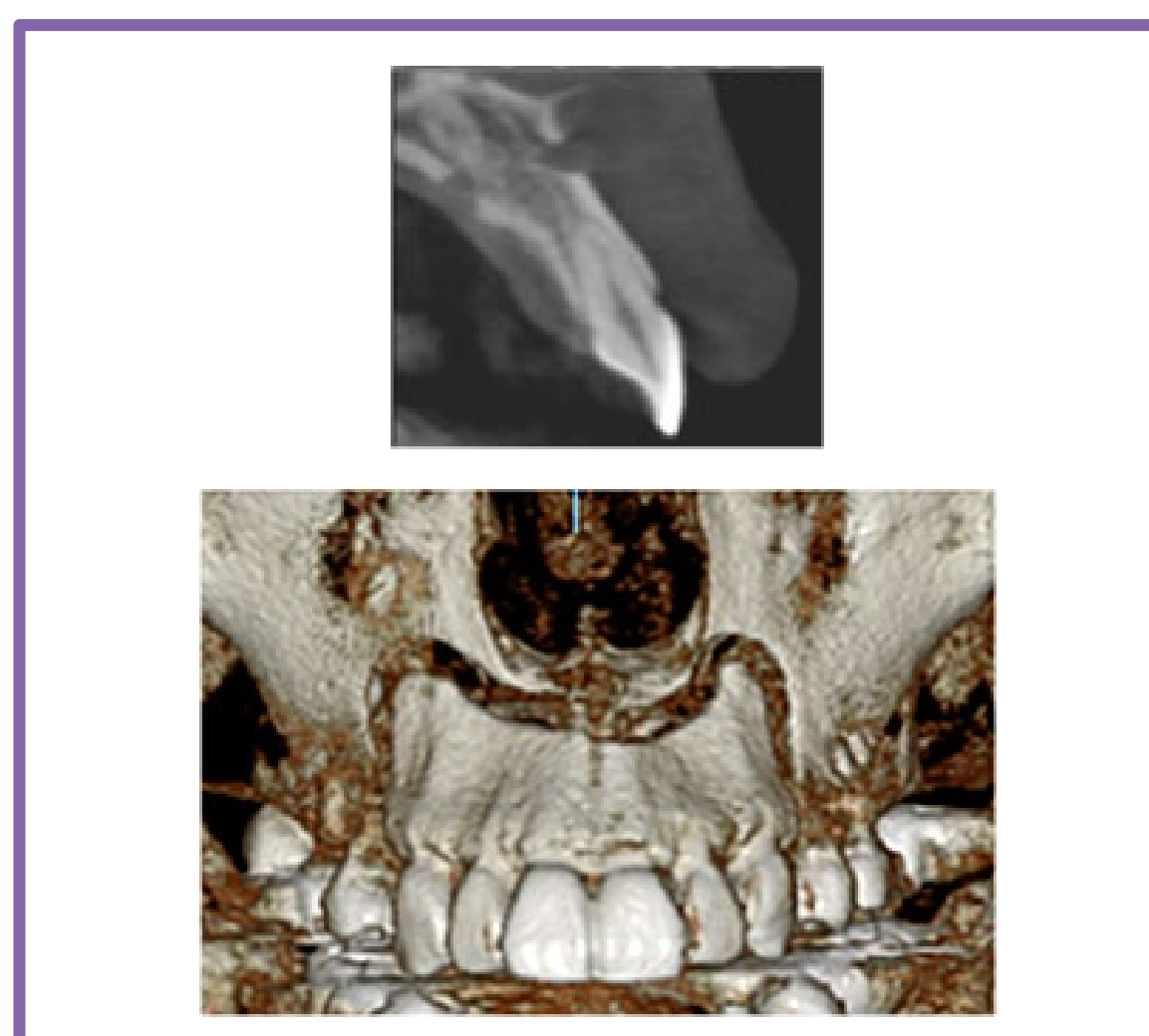
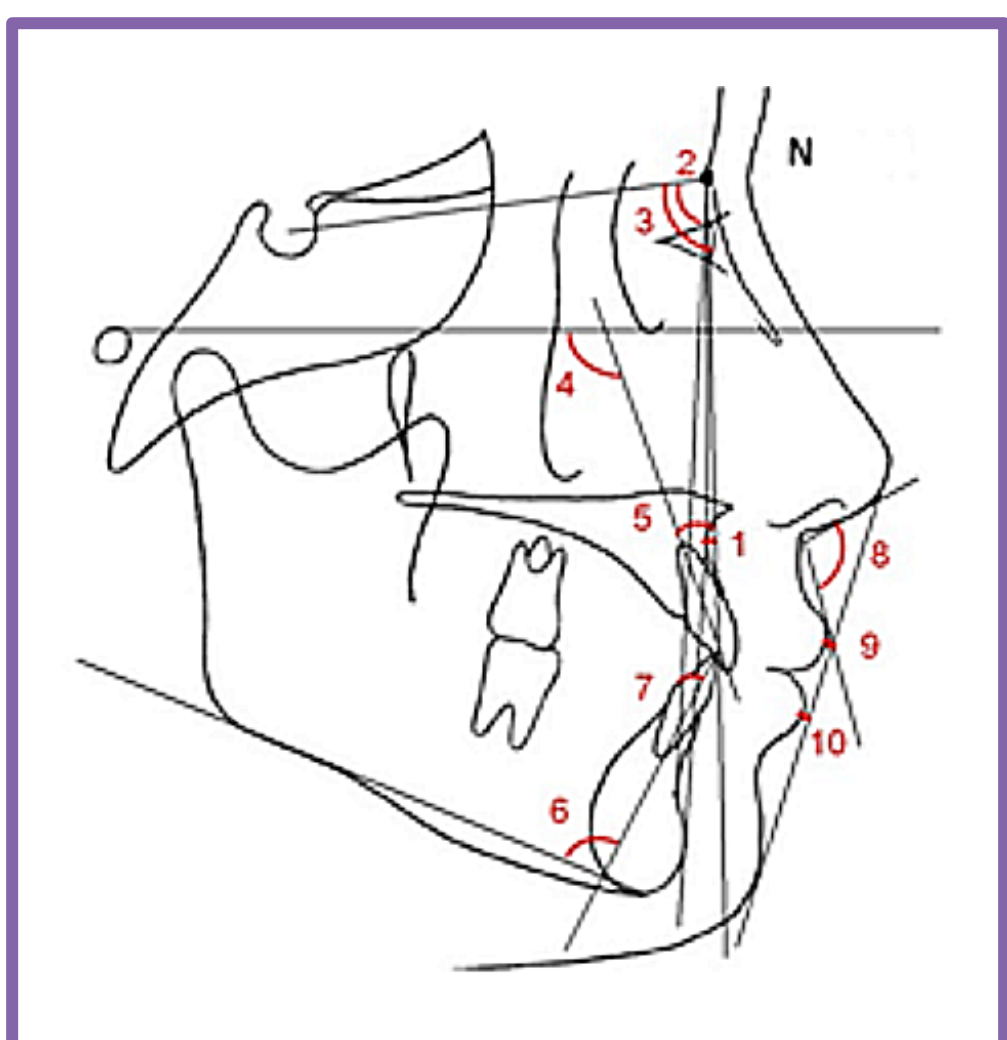
### Objectives:

This investigation aimed to evaluate the effectiveness of CRTA treatment combined with corticotomy in correction of excessive lip protrusion. More specifically, this study compared dentoskeletal and soft tissue changes in adult patients before and after corticotomy-assisted CRTA versus corticotomy-assisted conventional fixed appliance (CFA) therapies.



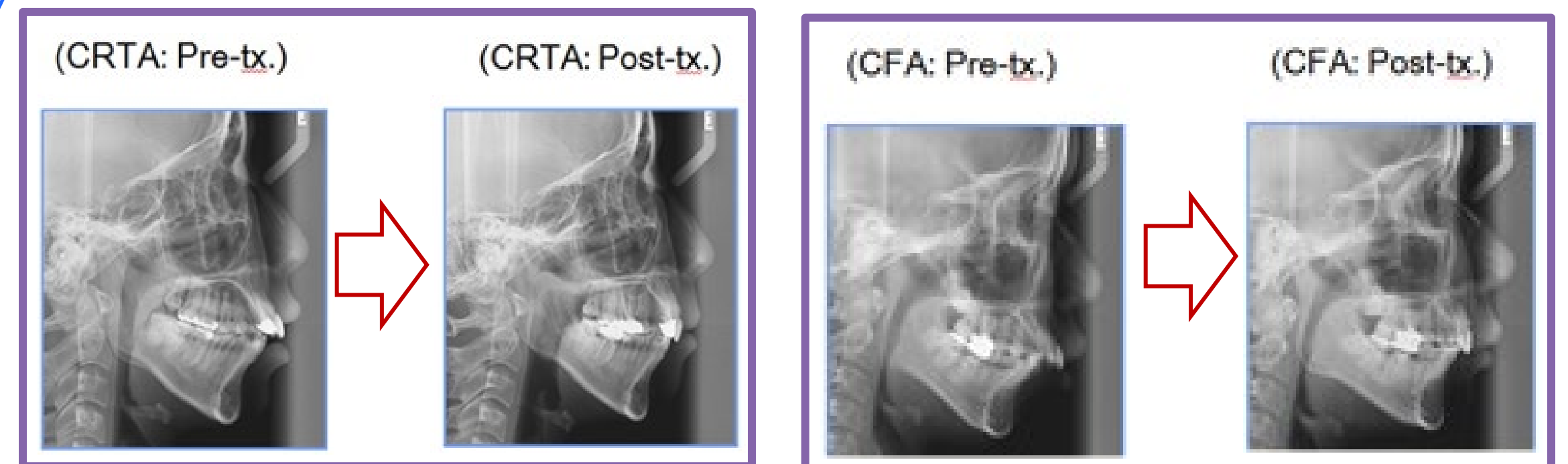
## METHODS & MATERIAL

Twenty adult patients in the CRTA group were treated with commercial transparent aligners while another 20 adults in the CFA group were treated with straight wire fixed orthodontic appliances with 0.022-slot Roth prescription. The maxillary bicuspids were extracted in all patients, followed by anterior corticotomy at the beginning of their orthodontic treatment. Dental and skeletal variables were traced and analyzed from the pre- and post-treatment lateral cephalographs. Paired *t*-test and multivariate analysis of variance were conducted to compare the dentoskeletal and soft tissue changes within and between the two groups.



## RESULTS

### CRTA vs. CFA



Treatment effects within each group displayed that all of the variables were statistically significantly changed after treatment completion in both groups ( $p < 0.01$ ). However, the amount of changes between CRTA and CFA groups showed no significant difference in all of the measured variables except U1 to APog angle ( $p < 0.03$ ). In the CRTA group A point was retracted by  $3.01 \pm 1.34$  mm and the maxillary incisors were retroclined by  $15.7 \pm 5.38$  degrees while in the CFA group A point and the incisor positions were changed by  $2.29 \pm 1.15$  mm and  $19.75 \pm 6.37$  degrees, respectively. Also, in the CRTA group, nasolabial angle was increased by  $8.30 \pm 5.89$  degrees while the upper lip was retracted by  $1.98 \pm 1.21$  mm. Similarly, in the CFA group, the nasolabial angle increased by  $8.18 \pm 6.27$  degrees and the upper lip was retracted by  $2.37 \pm 1.85$  mm.

### Summary Table of Cephalometric Changes

| Change in Variables | CRTA   |      | CFA    |       | P (CRTA vs CFA) |
|---------------------|--------|------|--------|-------|-----------------|
|                     | Mean   | SD   | Mean   | SD    |                 |
| A pt to N perp      | -3.01  | 1.34 | -2.29  | 1.15  | .07             |
| SNA                 | -2.50  | 1.19 | -2.18  | 1.58  | .46             |
| SNB                 | -0.70  | 0.92 | -0.85  | 1.32  | .68             |
| U1 to FH            | -14.20 | 5.74 | -12.63 | 22.15 | .76             |
| U1 to APog          | -15.65 | 5.38 | -19.75 | 6.37  | .03             |
| NAL                 | 8.30   | 5.89 | 8.18   | 6.27  | .95             |
| U lip to E line     | -1.98  | 1.21 | -2.37  | 1.85  | .44             |
| L Lip to E line     | -3.02  | 1.44 | -3.89  | 1.98  | .12             |

## CONCLUSION

Overall, both CRTA and CFA groups resulted in significant changes in skeletal, dental and soft relationship with the comparable magnitude of improvement. Therefore, corticotomy-assisted CRTA may be considered as a viable alternative for esthetically-sensitive adult patients with severe maxillary protrusion.