

# Conventional versus CAD/CAM self-ligating brackets, both in indirect bonding : a comparative study

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## Introduction

Custom-made self-ligating brackets (CAD/CAM) using indirect bonding transfer jigs have been introduced recently. However, well-designed studies are needed to clarify the interest of indirect bonding and CAD/CAM customized orthodontic appliances to reduce Orthodontic Treatment (OT) time and improve the accuracy of the final results. The objective of the present study was to investigate the effect of CAD/CAM self-ligating brackets compare to standard self-ligating brackets on OT duration and quality using indirect bonding with both.

## Materials and Methods

The study was designed as a comparative study and two groups of patients were involved :

- Group I (CAD/ CAM) consisted of 12 adult patients with minor to moderate crowding who received OT using the CAD/CAM customized indirect bonding self-ligating system (Insignia, Ormco, Calif).
- Group II (STANDARD : STD) enlisted 12 patients with minor to moderate crowding who received OT using the indirect standard self-ligating bonding system (Damon Q, Ormco, Calif).

The data collection was as follows :

- Baseline characteristics ;
- Different OT time : the overall treatment time, timing of the placement of each arch during the alignment phase, the overall alignment phase duration and the overall fine-tuning phase duration ;
- Quality of orthodontic results were calculated after treatment using the ABO Cast-Radiograph Evaluation (CRE) system score.

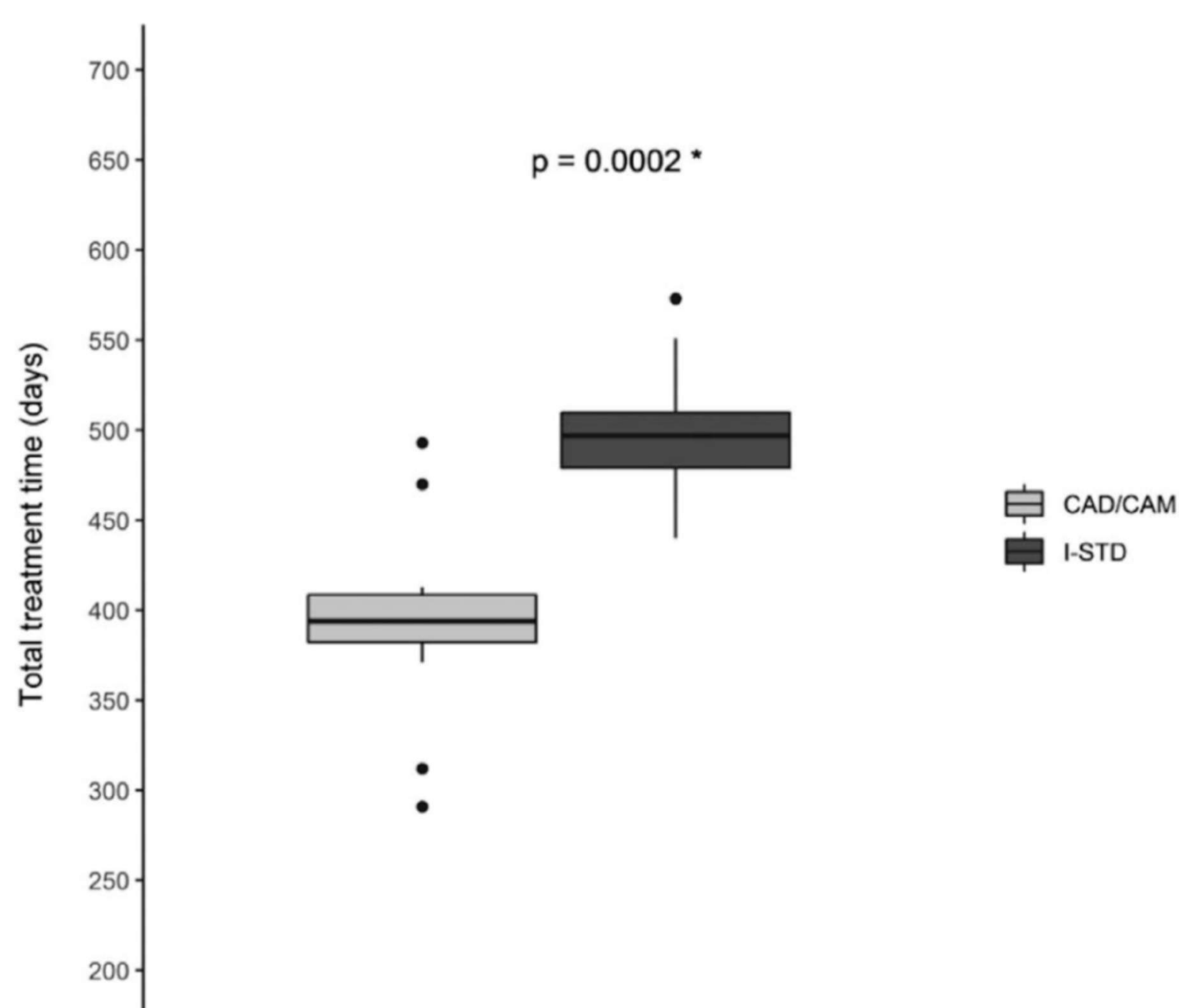


Figure 1. Overall treatment time in the two study groups.

## Results

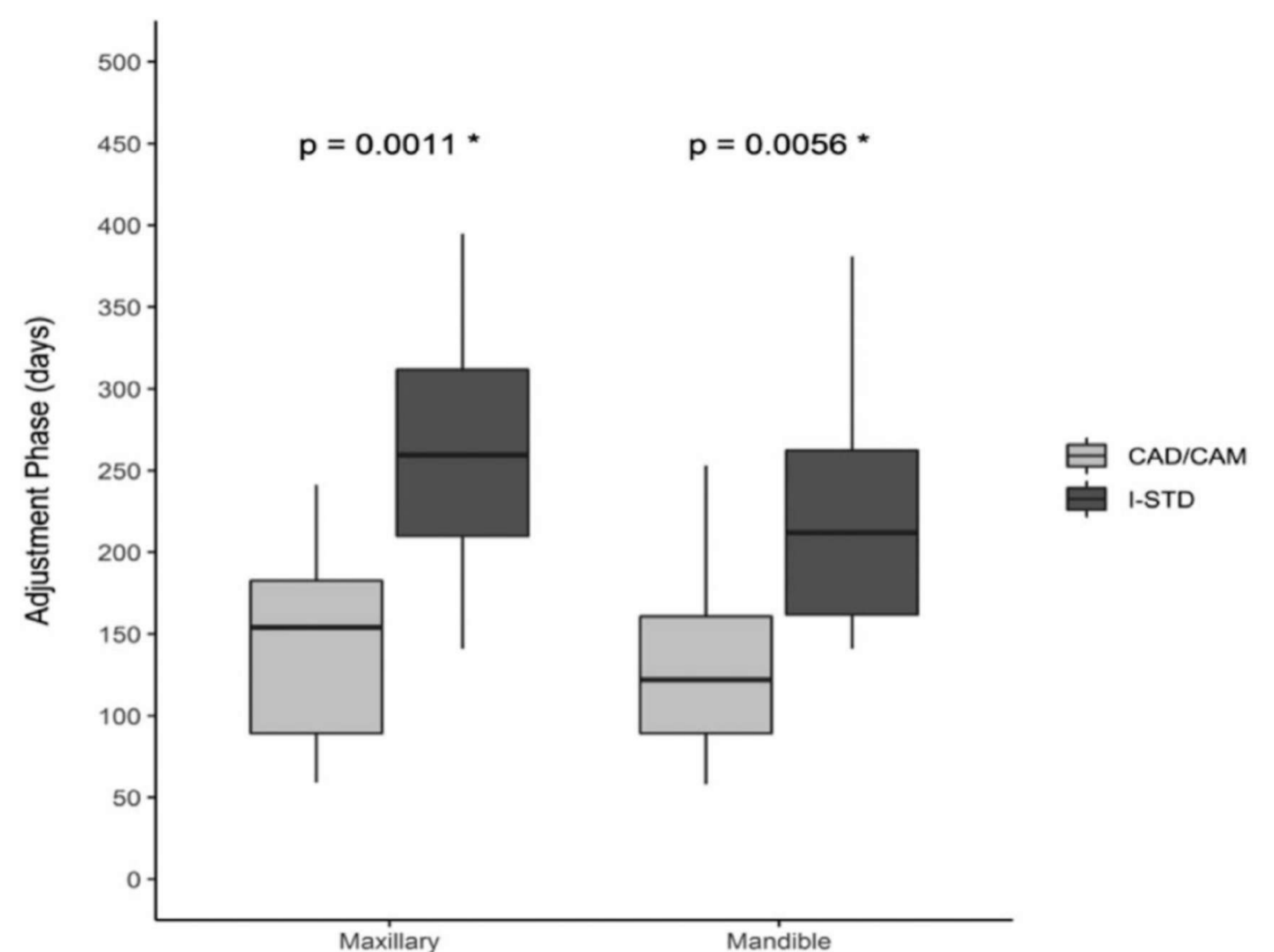


Figure 2. Fine-tuning phase in the CAD/CAM and STD groups

The following results were found :

- No difference in baseline characteristics was found between the two groups ;
- The overall OT time was reduced of 26% in the CAD/CAM group compared to the STD group (figure 1) ;
- As illustrated in Figure 2, the overall fine-tuning phase duration in the CAD/CAM group was shorter compare to the STD group in both the maxilla and the mandible ;
- The final ABO CRE scores showed no significant difference between the two groups (table 1).

Table 1. ABO Cast-Radiograph (ABO CRE) Scores in CAD/CAM and STD patients groups

	Group I (N = 12) CAD/CAM	Group II (N = 12) I-STD	Comparison P Value
	Mean ± SD	Mean ± SD	
Alignment/Rotations	2.8 ± 1.2	2.8 ± 1.1	.88
Marginal Ridges	4.2 ± 1.9	4.0 ± 2.0	.91
Buccolingual inclination	4.5 ± 2.2	4.5 ± 2.2	1.0
Overjet	2.4 ± 1.6	3.7 ± 2.5	.13
Occlusal contacts	4.5 ± 3.1	7.8 ± 3.7	.036
Occlusal relationships	1.7 ± 2.1	2.2 ± 3.7	.90
Interproximal contacts	0.50 ± 0.67	0.0 ± 0.0	.014
Root angulation	1.1 ± 0.90	0.75 ± 0.75	.34
Total CRE score	21.6 ± 6.3	25.7 ± 6.1	.11

## Conclusion

Despite a 26% longer OT time when compared with the CAD/CAM customized bracket system, the indirect bonding self-ligating bracket system exhibited the same quality of treatment result.

