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## Original Article

### Comparison of new centric relation technique with conventional technique

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#### ABSTRACT

**Background:** Centric relation is restricted to a purely rotary movement about the transverse horizontal axis. The present study was conducted to compare new centric relation technique with conventional technique. **Materials & Methods:** This study was conducted on 86 edentulous patients. Subjects were divided into Group I and Group II. CR in Group I patients was recorded using Dawson's bimanual technique (technique 1). In Group II, CR was recorded using conventional technique (technique 2). Time taken and accuracy of CR records by both the techniques were evaluated. **Results:** Group I had 20 male and 23 female and group II had 22 male and 21 female. The mean time taken in group I was 52.1 second and in group II was 10.4 seconds. The difference was significant ( $P < 0.05$ ). **Conclusion:** Both techniques were effective in recording centric relation (CR).

**Key words:** Centric relation, Dawson's bimanual technique, Edentulous

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#### INTRODUCTION

Patients usually require preconditioning prior to fabrication of new dentures so as to adapt to correct centric. There exist various techniques for recording centric relation (CR).<sup>1</sup> Centric relation (CR) is defined as "the maxillo-mandibular relationship in which the condyles articulate with the thinnest avascular portion of their respective discs with the complex in the anterior-superior position against the slopes of the articular eminences". This position is independent of tooth contact. In addition, it is clinically visible when the mandible is directed superiorly and anteriorly.<sup>2</sup> Centric relation is restricted to a purely rotary

movement about the transverse horizontal axis". Recording and reproducibility of a stable CR position at condyle level play an important role in reconstruction of occlusion and masticatory system.<sup>3</sup> The adaptive capacity of masticatory system allows utilization of structural and functional principles in treatment. According to the traditional gnathological principles, certain occlusal scheme, within defined anatomical limitations, permits condyles to adjust and function properly within the occlusal design.<sup>4</sup> On the other hand, functional occlusion concepts are based on morphological variations in condyle anatomy and Posselt's envelope stating that subunits of masticatory

system are controlled by their dynamic biological capacity. In other words, the modern definition of CR balances between gnathological and functional occlusal theories.<sup>5</sup> The present study was conducted to compare new centric relation technique with conventional technique.

**MATERIALS & METHODS**

The present study comprised of 86 edentulous patients of both genders. All patients were informed regarding the study and written consent was obtained. Ethical clearance was taken from institute ethical committee. Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups. Group I patients were guided into CR using technique 1 and group II patients were guided into CR using technique 2. Analogs for the denture-bearing areas in the upper and lower arches for both groups were fabricated, and the occlusal rims were constructed. Orientation and vertical jaw relations (JRs) were recorded using standard techniques. After the establishment of orientation and vertical JR, three orientation balls, 1 cm in diameter and 2 mm in thickness, were sealed to the upper record base along the midline – one behind the incisive papilla, the second at the center of the palate, and the third immediately anterior to the posterior palatal seal region.

Participants were shown the record bases and given instructions pertaining to the sequence and position where they must place their tongue during the procedure. The record bases were then inserted into the mouth; the participants were instructed to relax, to open the mouth at 20–25 mm, and to put the tip of the tongue into the first (anterior most) orientation ball, then move it into the second, and finally to the third orientation ball. Holding the tongue on the third orientation ball, they were instructed to close their mandible which would activate the elevator muscles to push the condyles into the fossa. When the patient could repeat the CR position, the rims were sealed using the nick and notch method. The time taken to record and establish CR was recorded using a digital timer.

For technique 1, time was recorded from the start of guiding the mandible into CR until the wax occlusal rims were sealed. For technique 2, recordings were made from the time that the patient placed his/her tongue on the first orientation wax ball to the time that the wax occlusion rims were sealed. All procedures were performed by a single operator trained in both techniques. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

| Group  | Group I | Group II |
|--------|---------|----------|
| Male   | 20      | 22       |
| Female | 23      | 21       |

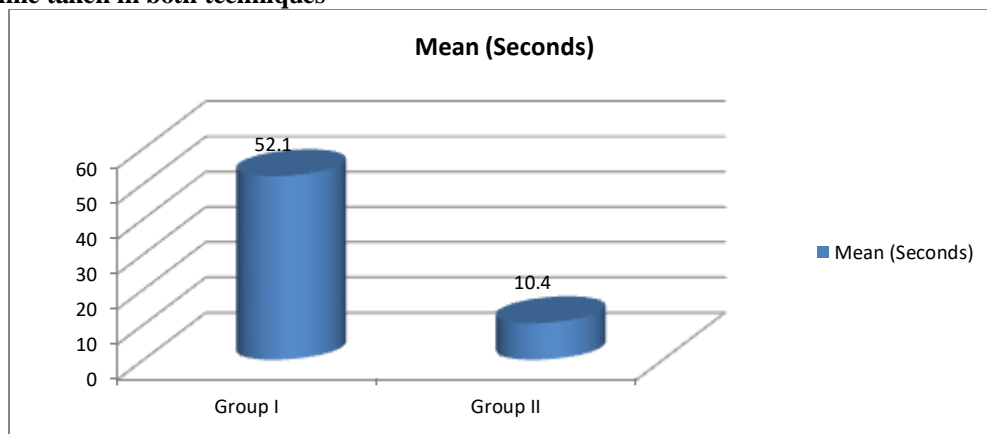
Table I shows that group I had 20 male and 23 female and group II had 22 male and 21 female.

**Table II Time taken in both techniques**

| Group    | Mean (Seconds) | P value |
|----------|----------------|---------|
| Group I  | 52.1           | 0.01    |
| Group II | 10.4           |         |

Table II, graph I shows that mean time taken in group I was 52.1 second and in group II was 10.4 seconds. The difference was significant (P< 0.05).

**Graph I Time taken in both techniques**



**Table III Percentage of accuracy for the two techniques**

| Group    | CR during JR coincided with CR during trial | Frequency | P value |
|----------|---|-----------|---------|
| Group I  | Yes   | 43 (100%) | 1       |
| Group II | Yes   | 43 (100%) |         |

Table III shows that both techniques were effective. CR during JR coincided with CR during trial.

**DISCUSSION**

The main characteristic of CR is its applicability in both healthy and unhealthy temporomandibular joints and masticatory muscles, as well as various dental statuses. Mandibular guidance techniques are divided into active and passive.<sup>6</sup> Generally, a guidance of the mandible into the CR position should be performed in physiologically reliable and unforced manner because an extensive guidance prevents positioning of the condyles in the CR position. There are many passive techniques which are used to determine the CR position. They include chin point guidance technique, three-digit technique, Roth's method, bimanual manipulation, anterior guidance technique using Lucia or the Pankey jig, spatula technique, the methods that employ “the best-bite” devices, leaf gauge, anterior deprogrammer, nociceptive trigeminal inhibition device etc.<sup>7</sup> Those who advocate the abovementioned techniques criticize “active or non-guidance techniques” because they believe that the maximum intercuspation position does not place condyles centrally and symmetrically in the glenoid fossa. On the other hand, the evidence of muscle imbalance caused by occlusal premature contacts does not ensure a reproducible and reliable CR position either.<sup>8</sup> The present study was conducted to compare new centric relation technique with conventional technique.

In this study, group I had 20 male and 23 female and group II had 22 male and 21 female. The mean time taken in group I was 52.1 second and in group II was 10.4 seconds. Sushma et al<sup>9</sup> conducted a study on sixty edentulous patients. The study participants were divided into Group I and Group II. CR in Group I patients was recorded using Dawson’s bimanual technique (technique 1). For participants in Group II, CR was recorded using the authors’ copyrighted technique (technique 2). The mean time taken for technique 1 was 56.47 s, whereas for technique 2, it was 5.97 s, with an overall mean difference of 50.5 s between the two techniques. Both techniques were found to be accurate, as the CR recorded during jaw relation matched with CR during trial in all the cases in both the groups (frequency 30 (N) and cumulative percentage 100%).

We found that both techniques were effective in recording CR. CR during JR coincided with CR during trial. Galeković et al<sup>10</sup> included thirty two fully dentate asymptomatic subjects (16 female and 16 male) with normal occlusal relations (Angle class I). The mandibular position indicator (MPI) was used to

analyze the three-dimensional (antero-posterior ( $\Delta X$ ), supero-inferior ( $\Delta Z$ ), medio-lateral ( $\Delta Y$ )) condylar shift generated by the difference between the centric relation position (CR) and the maximal intercuspation position (MI) observed in dental arches. The mean value and standard deviation of three-dimensional condylar shift of the tested clinical CR techniques was  $0.19 \pm 0.34$  mm. Significant differences within the tested clinical CR registration techniques were found for antero-posterior condylar shift on the right side posterior; and supero-inferior condylar shift on the left side inferior, whereas between the tested CR registration techniques were found for antero-posterior shift on the right side posterior and supero-inferior shift on the right side inferior on the left side inferior and on the left side superior.

**CONCLUSION**

Authors found that time taken by technique 2 were less as compared to technique 2. However, both techniques were effective in recoding CR.

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