# The study of comparison of the accuracy with a CADCAM technique and conventional semi-adjustable articulator method for the transferring the human mandibular movement.

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## Purpose

Recently,There are numerious literature of the CADCAM.However, There are few articles that it related to analysis of mandibular movement with CADCAM system. The purpose of this review is compare the accuracy with 2 corporation of CADCAM technique and conventional semi-articular method for the transferring the human mandibular movement. It made the following numeric character the same what the #1 incisal path inclination, #2sagittal inclination of protrusive condyle path, #3angle of lateral condylar path,(immediate side shift, and progressive side shift) to these system.Then,these system compare to real human mandibular movement with quantity of disocclusion of canine guidance and anterior guidance.

## Material & Method

The conventional procedure, using to participant study model and the location of the maxillary position and centric relation occlusion in reference to face-bow and centric bite. the kinematic inclination of the participant ( angle of condylar path, and incisal path) was determined with check bite, cephalometric analysis and using to the average value that result of previous research. in the beginning,It take cephalometric x-ray at a position of ICP. next, It take cephalometric a position of anterior guidance.and, to superimposed two x-ray,then determined to sagittal inclination of protrusive condylar path. It was 37°, and measured of angle of Balkwill, 26°.when decision of sagittal inclination of lateral condylar path, in the beginning , to determined of progressive side shift .using to average value 12.8°(Hobo et al,1982)
Hence, physically transferred to a semi-adjustable articular (company of A ) and brought into contact with the condyle sphere in the fossa box, decision to the immediate side shift became 0.5mm, both side. To decision of angle of incisal path, in patient-specific value.the anterior guidance is No.11 teeth.It measured to sagittal incisal path inclination with a CADCAM at 60°. the canine guidance of right side is No.13 and No.43 teeth at 45°, left side is 21, 22 and 31,32 at group function. 63°and 55°with a same CADCAM.To set avobe-mentioned numeral to two types of CADCAM. In addition, angle of incisal path is not setting. anterior guide table is Flat type. both of CADCAM and articulator.However, as compared with anterior guide table(sagittal is 40°,horizontal lateral is 120°) ,It was also obseved.then avobe mentioned objects make a mandibular movement to the semi-adjustable articular and CADCAM. To obtained with articulator movement , two types of CADCAM and real human mandibular movement that was founded by check Bite. Those were compared in a study model of participant. and calculating the deviation at individual distance of disocclusion.In the general, for measurement of disocclusion, using to leaf gauge. Whereas,The CADCAM is not appropriate to leaf guage. Thus, It attempted to measure the distance of disocclusion,that vertical distance from the mesial cusp of first and second molar to pairing tooth,and from the cusp of premolar and canine tooth to pairing tooth.
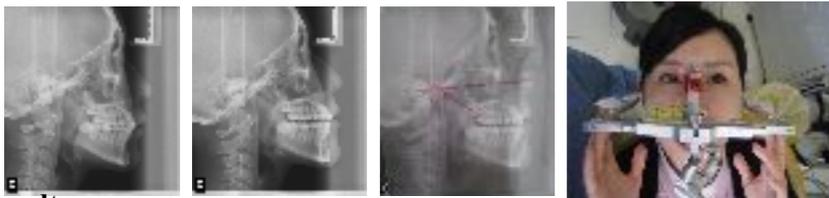


Fig 1:How to decision of condylar path inclination



Fig2:How to decision of incisal path inclination



Fig 3: each articulator

## Result

The results obtained to instability measured value as for individual situation. when the anterior guidance,distance of right side was 16 masial cusp to pairing tooth to have resembled the measured value, as for 5 all measure value, Whereas, other numerical value were very different to compare to human check bite. when the anterior guidance,distance of left side was 27 mesial cusp ,24 cusp to pairing tooth to have very different to compare to human check bite, other all on 4 measuring device were indicated resemble numerical value.The working and balancing side when the right canine guidance were company S's CADCAM to have particularly different numerical value, in comparison with other measurements. the mean was S,s CADCAM to have the most different from the check bite found that human mandibular movement. The balancing side when the left canine guidance were company A,s CADCAM to particularly different numerical value, in comparison with other measurements. the mean was A,s CADCAM to have the most different from the check bite found that human mandibular movement. The working side when the left canine guidance were semi-adjustable articular without anterior guide table to have particuarly different numerical value, in comparison with the check bite found that human mandibular movement.

The comparison to original the angle of incisal path between manufacture anterior guide table were different measurements when the balancing side of left canine guidance. The all measurements were not specialized in one device.The measurements changed in individual situation.
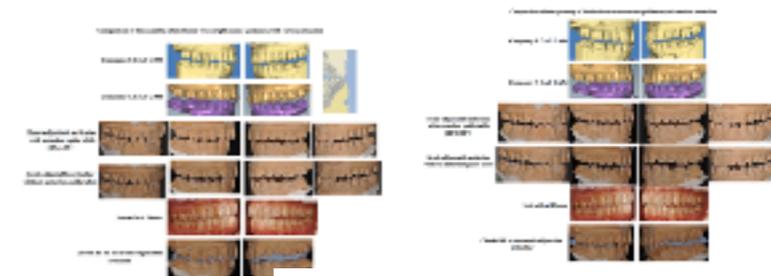


## Discussion

This study mean were the same measurements set 3 device, and One device changed the angle of incisal path(40°, 120°) in comparison the check bite found that human mandibular movements. Whereas,As for all devices could not reproduced human mandibular movements by found to check bite.The sagittal inclination of condylar path might be different measurements. Is it mean that the angle of incisal path were different measurements when the balancing side of left canine guidance? It was assed in particularly different to angle of left condyle path ,or It is not 30°,what angle of incisal path.There will be a human technical error in the analog articulator method.
However, There were very different measurements indicate of CADCAM,virtual articular method. both company of CADCAM were separately scanned the maxillary and mandibular study models, then ICP position determined with CAD soft.It was assessed in different to position of ICP by each company. Thus, The mandibular movement were different, in spite of what set a value the same kinematic inclination and angle of incisal .
In addition, It is the cause to have difficult CAD soft operation to a mandibular movement.And, It was assessed in the difference between articulator and real human mandibular movement of angle of condylar path setting errors.

## Conclusion

It is difficult to reproduce accurately human mandibular movements for CADCAM as of now. The aim of this article proposed what necessary to an appropriate protocol criterion to the requirement make the same for mandibular movement of virtual articulation when match the numeric in the fossa box and angle of incisal table, regardless of what company CADCAM is used, in the future.

Reference :Motion analysis of the mandible guidelines for standardized analysis of computer-assisted recording of condylar movements/ Ahlers MO et al. Int J Comput Dent 2015.18(3)201-203