ABSTRACT:


Introduction:

Success of complex prosthodontic procedures is not only enhanced by accurate simulation of the horizontal condylar path but also by simulating lateral condylar path of patient on an articulator. If condylar guidances are not recorded accurately, it will lead to occlusal interferences during mandibular movements. This may also increase chairside denture adjustment time, which can be frustrating for both the patient and the prosthodontist.

Aim and objectives:

The purpose of this study is to use radiographic technique to determine the lateral condylar guidance and compare these values with those obtained using Hanau’s formula, \( L = \frac{H}{8} + 12 \) and to evaluate whether there are differences between the right and left paths of the condyles.

Justification for the study:

Various clinical methods for recording the condylar guidance are intraoral check bite method, graphic tracings, and functional recordings. Accuracy of graphic tracings is affected by patient-related factors such as neuromuscular control of the individual, stability of record bases as well as stability of recording media. The accuracy and reliability of the methods used for programming the semi-adjustable articulators determine the accuracy in occlusion. The current recommended average settings using the Hanau’s formula, \( L = \frac{H}{8} + 12 \), commonly used by clinicians is questionable, and thus reassessment is needed.
Materials and Methods:

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No. of samples: Completely edentulous patients (n=20).

Outcome measures:

A statistically significant difference between the methods to determine Bennett angle is a good indicator to ascertain Bennett angle radiographically and minimizing the errors in complete dentures caused by the articulator calibration and an arbitrary formula calculation for L. The lateral interocclusal records obtained in this study can further be used in the Hanau™ Wide-Vue articulator to check and correct the occlusal errors thereby obtaining a balanced complete denture.

Method:

Articulator was modified with sectioned protractor for obtaining per degree interval calibration. After the impression procedures and procurement of master casts, the occlusal rims were constructed. The occlusal rims were inserted into the patient’s mouth and the vertical dimension at occlusion was recorded. Facebow transfer was done and gothic arch tracing was performed to obtain centric, protrusive, and lateral records. With the protrusive records, the horizontal condylar guidance [H] was adjusted and the Bennett’s angle [L] was calculated using the formula $L = \frac{H}{g} + 12$. With the tracing device in mouth, cranial radiographs in SMV projection was obtained. Each radiograph was traced and superimposed for Bennett angle determination. The Bennett angle obtained from both formula and radiographic tracings were tabulated and subjected to statistical analysis.
Statistical Analysis:

The data was subjected to statistical analysis by Mann-whitney-U test to find the correlation between the lateral condylar guidance between left and right sides and between the two methods on each side. Mann-whitney-U test was applied to check the difference between the right and left side condylar guidance determined by the two methods.

Result:

A statistically significant difference exists between LCG-C using Hanau’s formula and LCG-M using SMV projection method. Thus, the data supports rejection of the null hypothesis. LCG-M values exhibited no variation on both sides and there is no significant difference. Thus, the data supports rejection of the null hypothesis for this variable also.

Conclusion:

Within the limitations of the study, the following conclusions were deduced: 1.)There is no significant difference between the right and left LCG-C and LCG-M. 2.)There exist a huge difference between the LCG calculated from the conventional Hanau’s formula and LCG measured from the SMV projection radiographs.