Letter to Editor

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This letter discusses the advantages and limitations of the method used in the article "A technique for registration and reorientation of surveyed dental casts" by Majid Abolhasani, Amirhosein Shakibamehr, and Hamid Neshandar Asli for recording and reproducing the cast-surveyor relation.

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•Dental Casting Technique •Dental Technology •Lasers.

letter

An ideal method for recording and reproducing the tilt of the cast should be convenient, as accurate as possible, usable for multiple patient casts after only one registration, and not time-consuming. Accordingly, after reading the article "A technique for registration and reorientation of surveyed dental casts" by Majid Abolhasani, Amirhosein Shakibamehr, and Hamid Neshandar Asli [(1)] I found some advantages and limitations in the noted method:

Advantages:

1) Compared with conventional tripoding and scoring, recording and reproducing the tilt can be done in a shorter time.[(2)] There is no need to assess different regions of the cast to find appropriate points or lines, or to change the height of the surveying arm and rotate the cast holder continuously for reorientation. These may be achieved using other methods, too.[(3-11)]

2) As mentioned by the authors, the operator can be sure about the constancy of the cast-surveyor relation in a previously adjusted plane while adjusting another one. This, too, may be attained using other methods.[(3,4,6)]

Limitations:

1) The width of the laser beam and line drawn on the cast should be equal for accurate recording and reorientation procedures. Therefore, the width of the marker used for drawing the line on the cast should be considered. Additionally, the distance between the beam source and surfaces on which the lines are drawn is a factor determining the width of the beam on the cast because of ray divergence.

2) The reorientation procedure will not be accurate when multiple patient casts are going to be reoriented because the accuracy of the procedure would be affected by errors which occur while transferring the drawn lines from one cast to another. There are techniques that appear to be usable for reorienting multiple casts.[(3-5,7,9-11)]

3) The horizontal plane of the laser-producing system should be calibrated with the surveyor's horizontal plane. In other words, the beam and vertical axis of the surveying arm must be exactly synchronized when the beam angle is 90 degrees according to the numbers on the head of the device. Thus, the operator must calibrate the device and the surveyor and then start the tilt-recording procedure. The operator must send the calibrated angles to other operators. For example, when the beam angle is 2 and 70 degrees after calibration and recording, respectively, the operator must send 68 degrees and the recipient must sum 68 and her or his calibration angle.

4) An accurate numerical recording system can minimize the errors. However, the use of a degree-by-degree scale can cause sub-degree errors in vertical and horizontal planes. These small errors can significantly affect small retentive undercuts (e.g. 0.01 inches).[(12)]

5) It is relatively inconvenient to utilize a laser-producing device since it is not routinely used in laboratories or dental offices. Moreover, two laser-producing devices are needed to achieve the second advantage.

Therefore, complementary considerations should be regarded to resolve the limitations, and comparative studies are needed to determine accuracy, speed, and convenience of this method.

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Reply to the letter to the Editor

We appreciate the letter to the editor written by Manshaei M, entitled "How Is a Laser-Based Approach for Recording and Reproducing Tilt of Cast?," on the published article by Abolhasani M et al.[1] Therefore, many techniques have been presented by the authors to improve the tripoding process. Until now, no systematic study has compared these techniques.

The advantages mentioned in the letter to the editor could be considered as additional advantages for our study. In reply to the mentioned limitations, the following explanations are given:

It is better that the distance from the laser level to the cast is equal in recording and reorientation. However, because the ray is not a thin line, the lines drawn on the walls of the cast should be positioned in the center of the ray, parallel to the peripheries of the ray, or be matched to one boundary of the ray.

The bubbles on top of the laser level were used for increasing the reliability of the process.

Before recording, recreating the angles, these bubbles were positioned in the center of their surrounding space. Therefore, the base of the laser level and the inclination of the underlying surface would not affect angle measurement/recreation.

Many techniques published regarding the tripoding procedure, such as tripod markings,[2] use of magnetic devices,[3] or cemented pin orientation,[4] which do not employ teeth for recording or reorientation, are useful for reorienting the same cast on to the surveyor. One limitation of techniques that use the degree scale is that sub-degree measurements would not be considered, and this error may result in inaccurate placement of clasp assembly elements. One option for resolving this problem is to draw multiple lines onto the wall of the cast, and use one line which has the best matching to the exact degree, not sub-degree, decimal numbers.

Laser levels are not expensive and both the dentist and the technician can utilize them.

The presented method was a technical study. Comparative experimental and clinical studies are required to determine the most accurate method.

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