THE USE OF RECORDINGS BY A LOUPE-MOUNTED VIDEO CAMERA IN TRAINING OF FIXED PROSTHODONTICS ON MODELS

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Aim

To investigate whether the use of a loupe-mounted video camera enhances the learning and performance of undergraduate dental students in fixed prosthodontics.

Material and methods

Two groups, five students in each group, were randomly chosen from fourth year dental students. Merident Ultralight® 2,5 x magnifying loupes were provided to all students and Futudent® video cameras for the test group (Figure 1a). The task chosen for this study was to prepare in the skills laboratory on Frasaco® models the tooth d 16 for a porcelain-fused-to-metal crown. Only the members of the test group recorded their performance with the loupe-mounted video camera. The instructor assessed the students' performance by analyzing their individual video recordings (Figure 1b). The students had access to their own recording afterwards. The performance of the students in the control group was assessed conventionally, i.e. by giving verbal feedback based on the finished preparation. The setting was repeated two weeks later, but then both groups had access to cameras.

For assessment of the preparations each tooth preparation was scanned with a digital scanner and the data analysed using E4D Compare® -software to compare it to the same representative of an ideal known preparation (Figure 2a). Every preparation was screened for shoulder width, occlusal convergence, axial wall height and undercuts according to similarity to the ideal preparation (Figure 2b).
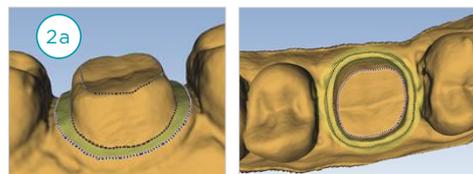

Figure 1a and 1b.
a) A student using Futudent® videocamera with Merident Ultralight® loupes.
b) still image highlight of a students video recording with added feedback.
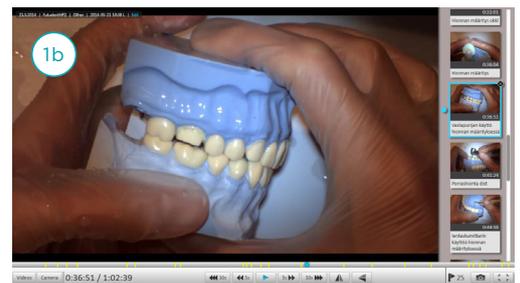
Results

No undercuts were observed in the model tooth preparations. No difference between the groups in the shoulder width of the model tooth preparation was observed (Figure 3a). The model tooth preparations of the test group were statistically significantly closer to the ideal preparation than those of the control group when analyzed for occlusal convergence (Figure 3b) and axial wall hight (Figure 3c).

Conclusions

The use of recordings by Futudent® video camera helped students to learn more efficiently tooth preparation for fixed prosthetic restorations. Video-clips of their own preparation promoted self-assessment by allowing them to reflect the procedure in their own time.

The use of a loupe-mounted video camera seems to enhance learning of clinical dental procedures and it facilitates specific individual instruction of the students.

Futudent® video camera is a new promising method for the assessment of dental students' performance.

Figure 2a. Representative shots of the digital scanning revealing the accuracy observed in some of the students' preparations in the second study setting after they had been given access to their individual video recordings supplemented with the written feedback.

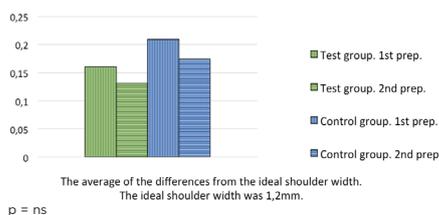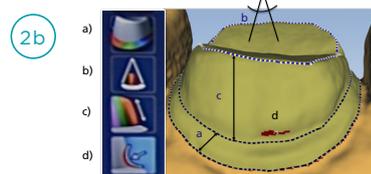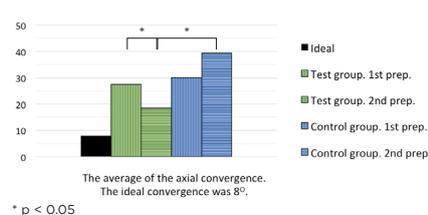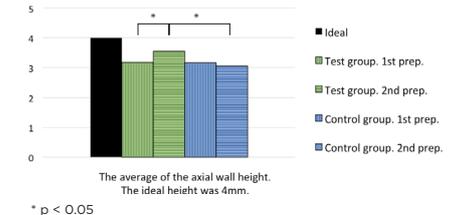**Figure 2b.** Each prepared tooth was scanned with a digital scanner (Planscan, Planmeca) and the data was analysed using E4D Compare® -software. The parameters analysed were (a) the width of the preparation, (b) the occlusal convergence, (c) the axial height and (d) undercuts.

Figure 3a. shoulder width

The average of the differences from the ideal shoulder width.
The ideal shoulder width was 1,2mm.

p = ns

Legend:
Test group. 1st prep.
Test group. 2nd prep.
Control group. 1st prep.
Control group. 2nd prep.

Figure 3b. occlusal convergence

The average of the axial convergence.
The ideal convergence was 8°.

* $p < 0.05$

Legend:
Ideal
Test group. 1st prep.
Test group. 2nd prep.
Control group. 1st prep.
Control group. 2nd prep.

Figure 3c. axial wall height

The average of the axial wall height.
The ideal heieht was 4mm.

* $p < 0.05$

Legend:
Ideal
Test group. 1st prep.
Test group. 2nd prep.
Control group. 1st prep.
Control group. 2nd prep.

Figure 3. Mean values of the monitored parameters of the tooth preparations in the test and control groups.

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