



ERRORS IN THE PARTIAL DENTURES FABRICATION PROCESS DURING PPDM LESSONS

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ABSTRACT

Aim: The aim of the research is to make an analysis of the most often FDM-Sofia students' errors in the partial dentures fabrication process.

Materials and methods: A number of 155 partial dentures were analysed after practical exam of the 2nd year FDM-Sofia students. Some of the basic fabrication errors were analysed such as; proper resin polymerization, finishing and polishing process, denture borders shaping, interdental spaces, teeth setup, clasps and major connector profile.

Results: The results from the research revealed significant theoretic and practical errors, due to inadequate training process of the students. We found a necessity to introduce a problem-based education in the PPDM training process.

Conclusion: The contemporary education in prosthetic dental medicine, should lead the students into understanding the frames of problem based education.

Keywords: partial dentures, student training process, problem based education

The partial dentures treatment is studied during the lessons and lectures of Prosthetic dental medicine department [1]. The errors in fabrication process, could cause trauma to oral mucosa, periodontium, teeth and TMJ [2]. These errors are two basic types; in denture planning and fabrication process or clinical mistakes [3]. Also another group of errors, could be described – aesthetic errors [3, 4]. According to another classification of errors, they could be divided to two groups – errors made by dental technicians and errors based on dental work [5, 6, 7]. The successive dental treatment require patients' satisfaction, faster denture adaptation and reduced disadvantageous effects from the treatment [8].

There are researches in the PPDM department about the wax modelling technique, student's theoretical and practical knowledge and there is no studies about the partial dentures fabrication process [2, 9, 10, 11, 12].

The aim of the research is to make an analysis of the most often FDM-Sofia students' errors in the partial dentures fabrication process.

MATERIAL AND METHODS

155 partial dentures were examined and analysed during the practical exam of the 2nd year FDM-Sofia students. The partial dentures evaluation was focused on the following criteria, based on the standards created by us about this research. The following criteria were observed: resin polymerization, finishing and polishing process, denture borders shaping, interdental spaces, teeth setup, clasps and major connector profile. A statistical sample is based on the Pearson nonparametric analysis, Phi correlation criterion, and normal alignment criterions. About the statistical sample production we used SPSS for Windows, 21.

RESULTS

The results showed correct resin polymerization (Fig. 2) in 61.9% (96 dentures) and 38.1% (59 dentures) incorrect resin polymerization (Fig. 3, 4). The results are similar to that about the criteria finishing and polishing process – correct finishing and polishing in 61.3% and incorrect in 38.7%.

Fig. 1. Well produced maxillary and mandible partial dentures



Fig. 2. Incorrect resin polymerization and finishing and polishing process. Maxillary partial denture



Fig. 3. Incorrect resin polymerization and finishing and polishing process. Mandible partial denture



Fig. 4. Thick denture plate and incorrect interdental spaces



Criteria denture plate thickness (Fig. 5). We found a correct plate thickness in 32.9% (51 dentures), 52.9% thick denture plates and 14.2% ultra-thin (transparent) parts of the denture plate. We found an interesting connection between the resin polymerization and plate thickness. For the upper denture the Pearson analysis showed a significant connection between the resin polymerization and the maxillary denture plate [$\chi^2=14.74$, $P<0.001$]. The correlation coefficient ϕ showed moderate connection – thicker plate-worse polymerization [$\phi=-0.31$, $P<0.001$] (Fig. 6). For the lower denture the Pearson analysis didn't show a significant connection between the resin polymerization and the maxillary denture plate [$\chi^2=3.79$, $P>0.05$]. The correlation coefficient ϕ showed a weak connection – thicker plate-worse polymerization [$\phi=-0.16$, $P<0.05$]. We found a statistical significance – thinner denture-better finishing and polishing process [$\chi^2=12.77$, $P<0.001$].

Fig. 5. Correlation between polymerization and thickness criterions

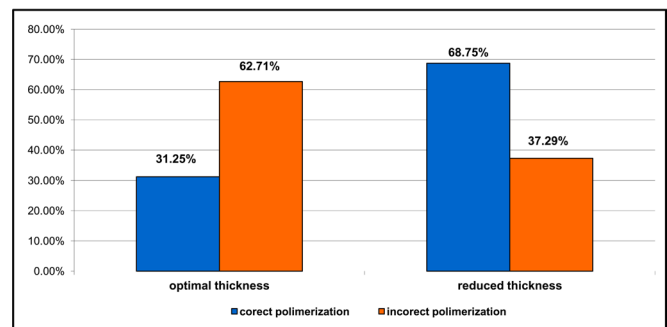
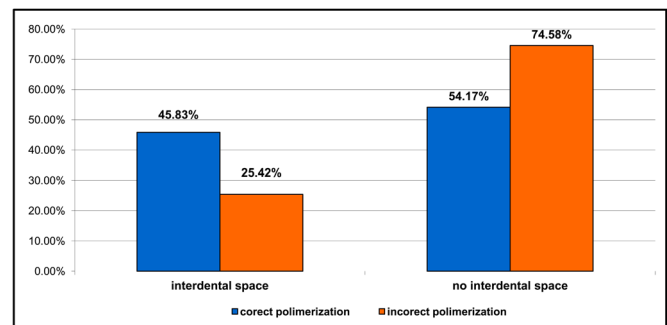


Fig. 6. Correlation between polymerization and interdental space criterions



The next special correlation is between polymerization process and the modelled interdental spaces. 38.1% (59 dentures) have shaped interdental spaces, and 61.9% (96 dentures) have no good-shaped interdental space. There is correlation between thicker denture plate and not good shaped interdental spaces.

44.5% from the dentures are with sharp, thin, bad-shaped margins. This is traumatic for the oral mucosa and the denture is not functional. (Fig. 8).

Fig. 7. Bad shaped margins, not good shaped interdental spaces, clasps covered with resin



Fig. 8. Correct major connector, clasps and interdental spaces



The teeth setup is a major factor in the denture stability and retention. 32.3% of the dentures were with incorrect teeth setup, away from the centre of the alveolar ridge.

We found errors and in the clasps setting up –

47.1% with a sharp tip, 31.67% curved or sliced by the grinders. 74% of the maxillary dentures are with errors in the palatal part of the double arm clasp (shortened, sliced or covered with resin). 74.8% by the dentures have errors in the retentive part of the clasp included in the denture. This part is shortened and non-functional.

The major connector of the mandible denture is correctly possessed in 43.2% by the dentures. 3.9% by the dentures are with shortened, 17.4% with elongated and 35.5% with incorrect possessed major connector.

The denture repair was evaluated by 2 factors – self-curing resin polymerization process and resin possession. We found a high correlation between the repair self-curing resin polymerization and the dentures resin polymerization $\chi^2=26.77$, $P<0.001$. The well-done denture resin polymerization correlates with well-done self-curing resin polymerization, and the statistical significance is very high $\phi=0.43$, $P<0.001$.

DISCUSSION

The analysis of the students' dentures and their errors must be taken into serious consideration. The accumulation of errors is a serious problem about students' theoretical and practical skills in the PPDM lectures and lessons.

Our aim is to show and eliminate these errors of the students in lectures and lessons. The multiplication of those errors in the future clinical exercise will lead to fabrication of non-functional and non-preventive dentures. We look for the students' manual skills development in the practical lessons along with their theoretical knowledge in the lectures. The students must find the correlation between both of them.

Our general aim in the PPDM teaching process is to interpret the correlation between the preclinical and clinical parts of the prosthetic dental medicine and to introduce the main question 'WHY'. 'WHY the dentures must be polished?', 'WHY the teeth must be correctly arranged?', etc.

CONCLUSION:

The contemporary dental medicine studying process includes problem based on students' education. We must create a logical students' thinking process and it to be the base for manual skills and good practice.

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