COMPARATIVE CLINICAL EVALUATION OF THE QUALITY OF SOME LONG TERM AMALGAM AND TOOTH COLOURED RESTORATIONS

¹ILEANA ROMAN, ²ANDREEA BUMB, ³ANCA TORCĂTORU

^{1,3} Faculty of Dental Medicine,, Târgu-Mureș, ²Private surgery, Târgu Mures

Abstract: The aim of the study is to comparatively evaluate the quality of consequent obturations. Material and method: Four hundred and sixteen patients aged 15 to 65 were included into the study. From the 3731 restorations examined, 1027 (27, 53%) were amalgam restorations and 2704 (72, 47%) were tooth coloured restorations, placed in all cavity classes. Results: Between ages 15-25 years, tooth coloured restorations (520) were mostly found, compared to only 260 for ages between 55-65 years. Concerning the number of amalgam restorations (299) there has been noticed a relatively equal weight of between 1^{st} and 2^{nd} class cavities. The marginal adaptation of amalgam restorations has proved to be incorrect in 455 cases out of 1027, and in 858 cases out of 2704 for the tooth coloured restorations. The oral hygiene mostly influences the quality of the tooth coloured restorations. Conclusions: Tooth coloured restorations tend to replace the amalgam, although this remains a viable option. The existence of a large number of inadequate restorations is due to an incorrect preparation of the cavities the incorrect restoration technique and inadequate oral hygiene.

Keywords: tooth coloured materials, amalgam, marginal adaptation, oral hygiene

Rezumat: Scopul lucrării este de a evalua comparativ. calitatea obturațiilor de durată. Material și metodă. S-au examinat 416 pacienți cu vârsta între 15-65 ani. Au fost evaluate 3731 obturații, din care 1027 (27,53%) din amalgam și 2704 (72,47%) fizionomice, aplicate în toate tipurile de cavități. Rezultate. La vârsta cuprinsă între 15-25 de ani, au existat preferențial obturații fizionomice (520) comparativ cu vârsta cuprinsa între 55-65 de ani (260). În privința numărului obturațiilor din amalgam (299) s-a constatat o pondere relativ egală la cavități de clasa I-a și a II-a. Adaptarea marginală la obturațiile de amalgam, s-a dovedit incorectă 455 cazuri din 1027, iar la obturațiile fizionomice, 858 din 2704. Igiena bucală influențează preponderent calitatea obturațiilor fizionomice. Concluzii. Materialele fizionomice tind să înlocuiască amalgamul, deși acesta rămâne o opțiune valabilă. Existența unui număr mare de obturații necorespunzătoare se datorează unei incorecte preparări a cavităților, nerespectarea tehnicii corecte de obturare și a igienei bucale.

Cuvinte cheie: materiale fizionomice, amalgam, adaptare

marginală, igiena bucală

INTRODUCTION

The coronary restoration represents the last stage in the cavity treatment. The recovery of coronary morphofunctional integrity supposes the use of some metallic and tooth coloured restoration materials.

Along with the market distribution of high quality white fillings materials, such as composite materials, the amalgam loses ground. Though there is controversy in the use of amalgam, correctly prepared and used, this allows acquiring some good quality coronary restorations.(1)

PURPOSE OF THE STUDY

The aim of the present paper is that of doing a comparative study of the quality of consequent amalgam and tooth coloured restorations.

MATERIAL AND METHOD

For the clinical evaluation of the quality of some consequent coronary restorations, we have examined 416 patients of both sexes, being more than 15 and less than 65 years of age, who came for consultation and treatment. The examination has been carried out by means of the mirror and of the probe after a previous air jet drying. In order to establish the correlation between the restorations correctness and the oral hygiene, we defined for each patient indexes of plaque, tophus and gingival inflammation. We have obtained the data about the restorations' age from the patients' reporting. In order to make the data interpretation more effective, we made out a standard form, where we registered for each tooth, the material from which the obturation was performed, its marginal adaptation, the cavity type, the obturation age, the indexes of plaque, tophus and gingival inflammation.

RESULTS AND DISCUSSIONS

At all 416 patients examined we discovered 3731 restorations, out of which 1027 (27, 53%) were from amalgam and 2704 (72, 47%) were physiognomic.

Along with the improvement of the performance of tooth coloured restoration materials, these gain more and more ground. Thus, I noticed that these are more numerous, both under five years of age and over. The

AMT, v. II, no. 4, 2009, p. 289

restorations of over five years of age are prevailingly of amalgam.

Picture no. 3. The evaluation of coronary restorations on age groups





Picture no 2. Cavity evaluation, depending on the restoration material



Morwafi et. al (2) by analyzing the long term behavior of the composite materials, show a success rate of 90 % after 5 years. The restorations' distribution, according to the types of cavities, is presented in the chart below.

In the above attached chart there can be noticed the difference between the amalgam restorations number (637) related to that from composite materials (507). The application of tooth coloured restorations to 1^{st} and 2^{nd} class cavities, where there is a strong mechanical force is due to the mechanical qualities improvement of the latter ones. Mair (2) noticed that after 10 years the resistance of the tooth coloured materials applied on the side teeth, is similar to that of the amalgam restorations.

Divided into groups according to age, we have noticed that between 15-25 years there existed only 130 amalgam restorations and 520 tooth coloured ones while between 55-65 years there existed 299 amalgam restorations and 260 tooth coloured ones, the numbers being approximately equal.



Taking into account that the time duration of the restorations also depends on the quality of the adaptation to the cavities sides, we have also approached this aspect in our study. The obtained data are registered in chart no. 4.

Picture no.4. The evaluation of coronary restorations related to marginal adaptation and cavity type



From our examinations, we have noticed that there is quite a large number of tooth coloured restorations, incorrectly marginal adapted. The explanation would be that the composite materials bind through the polymerization reaction (including those whose reaction is initiated by light) thus suffering volume changes, through contraction during this reaction. The minimization of this effect can be realized by adding glass particles in the material composition. The improvement of the marginal adaptation could be done by using a higher quality adhesive system and by complying with the restoration applying technique, but as Ferrari et. al. (3) show, even the best adhesive system cannot irretrievably remove the danger of the imperfect marginal closing. A substantial improvement of the adaptation is being obtained by applying a fluid composite layer before inserting the restorative material. As for the amalgam, the use of an adhesive bonding can prevent the microleakage

AMT, v. II, no. 4, 2009, p. 290

only on short term. On long term, this is not a dominant parameter in reducing the microscopic spaces, around the amalgam restorations (Ziskind et. al. (4)).

Another aspect of our study was the possible correlation between oral hygiene and the quality of coronary restorations. Thus we have noticed that on both tooth coloured restorations and amalgam ones, oral hygiene directly proportional influences the restoration quality. (see picture no.5)

Picture no. 5. The correctness of the consequent coronary restorations related to plaque indexes



From our restorations by comparing the quality of the amalgam restorations with the one of tooth coloured materials, we have noticed that both had deficiencies. Duke (5) shows that there is a risk for any rehabilitating material, and that there always exists a riskbenefit proportion.

CONCLUSIONS

In our study we have met more amalgam restorations, in 1^{st} and 2^{nd} class cavities at the age of over 45 years old, the tooth coloured restorations prevailing at young people.

The large number of incorrect amalgam restorations (455 out of 1025) and tooth coloured ones (858 out of 2704), shows that a greater attention must be paid both to cavities preparation and to the compliance with the restoration techniques.

The coronary tooth coloured restorations (414) proved to be more vulnerable than those from amalgam (256), for a defective oral hygiene, the correlation being directly proportional to the increase of the plaque index.

The duration in time and the quality of the coronary restoration, depends not only on the restoration material that is being used but also on the correctness of applying the restoration technique and on the compliance with a corresponding hygiene.

REFERENCES

- 1. Jones D. The enigma of amalgam in dentistry, BDJ, 1994;175(5):159-169.
- Ritter A. Recomandări generale pentru rezultate clinice optime, Actualități stomatologice, 2006(28);15-24.
- 3. Ferrari M, Davidson C. Etanșeitatea închiderii

marginale realizate cu FujiIX în obturațiile coronare în cavități de clasa a II-a, Actualități stomatologice 1999;(1):4-15.

- 4. Yiskind D, Venezia E, Kreismann I. Mass E, Amalgam type, adhesive system and storage period as influencing factors on microleakage of amalgam restorations, J Prosth Dent, 2003;(90):255-60.
- 5. Duke E. Dacă nu amalgamul, atunci? Actualități stomatologice 2004;(23):26-28.