



A LASER DOPPLER FLOWMETRY FOR MEASURING THE PULP BLOOD PERFUSION IN TEETH WITH POSTOPERATIVE SENSITIVITY – a case report

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SUMMARY

Purpose: To study the blood perfusion in teeth with post operative sensitivity.

Material and Methods: A twenty years old female came to the Department of Operative Dentistry and Endodontics with complains of postoperative sensitivity in one upper premolar and one lower molar. The teeth were restored by resin-composite restorations and two-step adhesive. Measuring of the pulp blood perfusion of the sensitive teeth and comparing with healthy ones was accomplished by using laser Doppler device moorVMS-LDF2. Pulp vitality was assessed by conventional cold and electrical pulp tests. Subjective symptoms were measured by VAS. Saliva biochemistry was evaluated by Saliva Check Buffer test.

Results: The upper premolar, tooth 25, showed 28,5 PU, the lower molar, tooth 36, showed 21,9 PU. The electrical pulp test of teeth was 17 μ A and 44 μ A respectively. The cold response of teeth was 2,5s and 5,0s. According to VAS, the intensity of pain in tooth 25 is 4,3mm and in tooth 36 2,1mm.

Conclusion: Laser Doppler flowmetry is used for the first time for measuring the blood perfusion in teeth with postoperative sensitivity. For revealing the connection between pulp hemodynamic and postoperative sensitivity future studies are needed in which laser Doppler flowmetry can be highly valuable.

Key words: laser Doppler flowmetry, pulp blood perfusion, post-operative sensitivity

INTRODUCTION:

Laser Doppler flowmetry is a modern noninvasive method for tissue hemodynamics assessment [1, 2].

The technique is based on measuring the Doppler shift induced by moving red blood cells to the illuminating coherent light [3, 4].

A laser Doppler instrument output gives flux, velocity and concentration of the moving blood cells. These parameters are extracted from the power spectrum of the photocurrent fluctuations produced by reflected light illuminating a photodetector [5].

There are two types of perfusion measurements in practice, laser doppler perfusion monitoring and laser doppler perfusion imaging [6, 7].

Despite recent scientific advances in restorative dentistry, adhesive restorations may present marginal discoloration, microleakage, postoperative sensitivity and develop secondary caries over time, which can lead to restoration failure.

Several clinical studies have reported that nearly 30% of patients present **postoperative sensitivity** after placement of resin composites in posterior teeth.

No scientific research data are found for pulp hemodynamic assessment of teeth with post operative sensitivity by using laser Doppler flowmetry.

AIM:

To study the blood perfusion in teeth with postoperative sensitivity.

MATERIAL AND METHODS:

A twenty years old female D. B. came to the Department of Operative Dentistry and Endodontics with complains of postoperative sensitivity in one upper premolar and one lower molar. Full medical history was taken and clinical observation was done. The teeth were restored by resin-composite restorations and two-step adhesive a month ago. Subjective symptoms were measured by VAS. Saliva biochemistry was evaluated by Saliva Check Buffer test. (Fig. 1.)

Fig. 1. Saliva testing.



RESULTS:

RR 110/70, puls 85-90 per min, cold palms, skin miosis (on the back), strong antagonizing teeth contacts were observed.

Saliva Check Buffer testing showed: pH 6.4; Quantity 7.0-7.5 ml; Buffering 10 (normal)

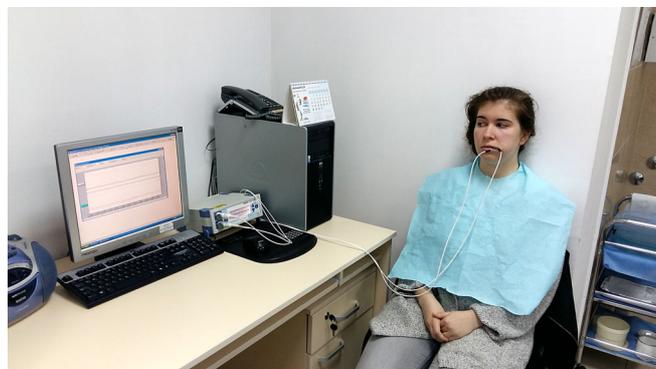
The electrical pulp test of teeth for tooth 25 was 17 μ A and for 36 was 44 μ A.

The cold response of teeth was after 2,5s tooth 36 and after 5,0s tooth 25. According to VAS, the intensity of pain in tooth 25 was 4,3mm and in tooth 36 2,1mm.

The upper premolar, tooth 25, showed 28,5 PU of mean blood perfusion. The lower molar, tooth 36, showed 21,9 PU.

Measuring of the pulp blood perfusion of the sensitive teeth and comparing with healthy ones was accomplished by using laser doppler device moorVMS-LDF2. (Fig. 2) Pulp vitality was assessed by conventional cold and electrical pulp tests.

Fig. 2. Measuring of the pulp blood perfusion.



DISCUSSION:

Laser Doppler flowmetry is used for the first time for measuring the blood perfusion in teeth with postoperative sensitivity. It is the only objective clinical method for assessing the pulp perfusion and therefore its actual status which can give some answers about the problem with post-operative sensitivity [8, 9, 10].

CONCLUSION:

For revealing the connection between pulp haemodynamics and postoperative sensitivity future studies are needed in which laser doppler flowmetry can be highly valuable.

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