

## METHOD FOR PROFESSIONAL WHITENING OF FLUOR-COLOURED TEETH

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### SUMMARY

**Introduction** – The change of teeth color comes as a result of external discoloration due to bad oral hygiene, excessive ingestion of coloring foods and drinks, the activity of chromotogen bacteria and fungi, etc., as well as of internal reasons the most common of which is the excessive intake of fluoride and antibiotics in the early years of childhood.

Although in the past years a clear tendency to increased tooth fluorosis has been observed dentist are not well informed about the methods of its treatment.

**Aim** – The purpose of the present study is to introduce a methods of professional whitening of fluorosis-affected teeth by means of light-activated hydrogen peroxide.

**Material and methods** – An object of this study are fluorosis – coloured teeth.

A 35% gel “Lase peroxide sensy” (DMC-Equipamentos, Brasil) activated by “Bluedent 12 BL” curing light (D&A Electronics, Bulgaria) was used by their whitening.

The treatment was carried out in four consecutive visits and every time the whitening gel was applied three times and lighted for seven minutes.

Before the last whitening the enamel surfaces were microabraded with the help of abrasive discs DF 12.7 G (Axis, Switzerland) and Clean Polish paste (Kerr Hawe SA).

Finally, the teeth were polished with rubber covered with desensitizer – Lase Peroxide Sensy II, containing 2% Sodium Fluoride and 5% Potassium Nitrate.

**Results** – By all teeth, cured by this way, the fluor stains got discolored and we got a high aesthetic effect.

**Conclusion** – Fluorosis-affected teeth whitening by means of light-activated hydrogen peroxide is a fast and efficient method which preserves teeth vitality and their anatomic shape.

**Key words** – tooth fluorosis, professional whitening

### INTRODUCTION

Good looking white teeth have turned to be a norm in highly developed societies, even an obsession which according to Christensen G.J.<sup>7</sup> will not fade away in the nearest future. In a research survey referring to teeth

whitening Joiner A indicates that 28% of the investigated people in Great Britain and 34% in the USA are not satisfied with the look of their teeth.

Change in teeth color differs in its etiology, appearance, localization, depth and attachment to dental structures<sup>9</sup>.

External discoloration is caused by accumulation of pigments on uneven surfaces and the rough parts of the enamel resulting from the combination of bad oral hygiene and excessive ingestion of red wine, cigarettes, coffee, coke. In some cases they are associated with the activity of chromotogen bacteria and fungi, hormonal misbalance or even personal occupation<sup>2</sup>. Whitening of those colored but vital teeth is comparatively easy by means of ultrasound or powder cleaning, polishing with light abrasive pastes, rubbers and brushes. Various systems of professional or home whitening based on hydrogen peroxide, carbamide peroxide or sodium perborate<sup>4</sup> are becoming more and more wide-spread.

Internal teeth discoloration results from systematic diseases in the period of ontogenesis or from local causes with post-eruptive action<sup>2</sup>. The most common reasons are the continuous intake of antibiotics from the Tetracycline group or Fluoride in big doses in the early years; common or hereditary diseases, iatrogenic reasons.

Tooth fluorosis or the so called “colored enamel” is a form of enamel hypoplasia characterized by the formation of different in color (from chalky white to dark brownish) stains on the tooth enamel located under its surface, in the external third of its thickness<sup>8</sup>.

Bayley R. and Christen A.<sup>6</sup> describe four methods of elimination of such coloration from vital teeth: selective peeling and polishing of the enamel, whitening with 18-30% hydrogen peroxide with or without ether, removal of dental substances with hydrochloric acid and a combination of those three methods.

Crol T.<sup>8</sup> removes the colored enamel by its mechanical “micro reduction” with the help of a diamond bur and subsequent application of an abrasive mixture (PREMA or Opalustre) which contain hydrochloric acid.

In the past years there has been a clear tendency to increase of dental fluorosis<sup>11</sup>. In Bulgaria Kukleva M. and colleagues<sup>3</sup> detected fluorosis in 54,5% of the tested

children. The affected teeth were not only the primary teeth but also the permanent ones. At the same time the insufficient information of the dentists with respect to diagnostics and treatment of this disease has been taken into consideration. Apart from the negative effect on the teeth, their coloring in cases of fluorosis also cause a permanent psychological troubles upon people having this damage.

In our country the question of whitening of fluorosis-affected teeth with light-activated hydrogen peroxide has not been discussed so far. This has motivated us to share our experience.

#### **A case of study**

For a better illustration of our method for professional whitening of fluor-coloured teeth, we present the following case.

T. N., 23 years old from Moldova, was advised to visit us as a patient. The clinical examination showed second to third-degree fluorosis coloring affecting all permanent teeth on the upper and lower jaws – Fig. 1. Anamnesically the patient lived until her 10th year in a region with high fluoride content in the water. The non-aesthetic appearance of her teeth strongly depressed the patient - she talked with a minimum opening of her mouth and we did not see her smile during her first visit.



**Figure 1.** Initial appearance of the teeth

In order to remove the fluorosis coloring we decided to apply professional whitening under the methodology developed by us<sup>1</sup> with 35% gel “Lase peroxide sensy” (DMC – Equipamentos, Brazil), activated by “Bludent 12 BL” curing light (D&A Electronics, Bulgaria).

We carried out this treatment during four subsequent visits; during each visit we applied the whitening gel three times and lighted it for seven minutes.

After the first procedure there were brown areas only in the mesial surfaces of the upper central incisors – Fig 2.



**Figure 2** Teeth appearance after the first whitening procedure.

On the second and third visit we selectively treated only those areas in order to prevent from excessive whitening of the rest of the teeth – Fig. 3.



**Figure 3.** Teeth appearance after the second whitening procedure.

After the third procedure the patient indicated that she was satisfied with the effect. Indeed, her teeth had almost uniform light color. However, this result was not satisfactory for us since there were areas in the upper side incisors and canines with chalky white and grey shades – Fig. 4.



**Figure 4.** Teeth appearance after the third whitening procedure.

This is why we decided to carry out enamel microabrasion with the help of abrasive discs DF 12.7 G (Axis, Switzerland) and Clean Polish paste (Kerr Hawe SA), whitening of all teeth, polishing with rubber and application of Lase Peroxide Sensy II desensitizer, containing 2% Sodium Fluoride and 5% Potassium Nitrate. The result is presented in Fig. 5.



**Figure 5.** Teeth appearance after the microabrasion and their final whitening.

#### DISCUSSION

The method of active (professional) whitening of fluorosis-affected teeth showed good efficiency for a short time. In case of second or third degree of fluorosis the enamel is rough and porous. This enables the hydroxiperoxide gel which is in very high concentration (35%) to reach the colorants and break their double links or to oxidize parts of

their chemical structure<sup>10</sup>. The consistency and color of the gel enable its precise application only upon the colored areas thus preventing the rest of the dental structures.

A disadvantage of the method used by Krol in our opinion is that the even peeling of the enamel is hard to control and the anatomic teeth shape is also changed. The presence of acids in the whitening substance which are rubbed into the enamel for about 20 minutes create the actual possibility for damage of the teeth, the gingival tissues and the oral mucous.

Microabrasion applied by us in the last stage of the treatment was intended to provide smooth surface of the enamel which would be healthier and more resistant. We think that the use of diamond burs for enamel removal is not necessary. The abrasive discs can smooth the tooth surface more delicately and without the unnecessary removal of tissues.

#### CONCLUSION

Increase in dental fluorosis in the last years imposes a new view upon the methods of its treatment.

The active (professional) whitening using light-activated hydroxiperoxide gel is a method which enables fast and efficient removal of enamel coloration without any risk of loss of tooth vitality.

Microabrasion with the help of abrasive discs provides an opportunity for subsequent formation of smooth, resistant aprismatic enamel without changes of its anatomic shape.

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