MINIMALLY INVASIVE AESTHETIC TREATMENT OF WHITE SPOTS BY DENTAL FLUOROSIS IN CHILDREN: CASE REPORT

João Victor Frazão **Câmara**[1], Daniel Otero Amaral **Vargas**[1], Isabel Ferreira **Barbosa**[1], Julio Cesar Campos Ferreira **Filho**[2], Amara Eulália Chagas **Santos**[1], Hana **Fried**[1], Lucianne Cople **Maia**[2], Gisele Damiana da Silveira **Pereira**[1*]

[1]Department of Dental Clinic, School of Dentistry, Universidade Federal do Rio de Janeiro.
[2]Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Universidade Federal do Rio de Janeiro.

Palavras-chave: Fluorose Dentária. Microabrasão do Esmalte. Clareamento Dental.

RESUMO

Introdução: A presença de manchas brancas por fluorose dentária pode causar desconforto estético, sendo um dos fatores para busca de tratamento odontológico. **Objetivo:** Relatar um caso clínico em que a queixa estética foi resolvida através da associação do clareamento dentário à técnica de microabrasão. **Relato do caso:** Paciente do sexo masculino, 13 anos, compareceu a Clínica Integrada da Faculdade de Odontologia da UFRJ, com fluorose, principalmente nos dentes ântero-superiores e queixa estética. Inicialmente, realizou-se clareamento imediato com peróxido de hidrogênio a 35%, em 3 sessões de 15 minutos, para suavizar a disparidade de tons entre mancha-dente. O resultado obtido foi insuficiente e a técnica de microabrasão dentária foi adotada. Uma pasta de pedra pomes foi aplicada juntamente com gel de ácido fosfórico a 37% sob isolamento relativo, perfazendo um total de 8 aplicações (1 minuto cada). Ao final de cada aplicação, foi realizada lavagem abundante com água, polimento com disco de granulação fina montado em micromotor e aplicação tópica de NaF2 neutro em gel (4 minutos cada aplicação) para eliminar possível sensibilidade pós-operatória. **Conclusão:** O clareamento dentário e a técnica de microabrasão promoveram resultados clínicos imediatos satisfatórios que elevaram a autoestima do paciente, de maneira minimamente invasiva para estrutura dentária.

Keywords: Fluorosis, dental. Enamel Microabrasion. Tooth Bleaching.

ABSTRACT

I**ntroduction**: The presence of white spots due to dental fluorosis can cause aesthetic discomfort, being one of the factors for a search for dental treatment. **Objective**: Report a clinical case in which the aesthetic complaint was solved through the association of the dental bleaching to the microabrasion technique. **Case report:** Male patient, 13 years, attended to the Integrated Clinic of the School of Dentistry of the Federal University of Rio de Janeiro, with fluorosis, mainly in the antero-superior teeth and aesthetic complaint. Initially, it was made an immediate bleaching with hydrogen peroxide at 35%, in 3 sessions of 15 minutes each, to soften the disparity of shades between tooth-stain. The result was insufficient and the dental microabrasion technique was adopted. A pumice paste was applied together with gel of phosphoric acid at 37% under relative isolation, in a total of 8 applications (1 minute each). At the end of each application, it was made an abundant water washing, microengine mounted fine-grained disc polishing and topical application of neutral NaF2 in gel (4 minutes each application) to eliminate possible postoperative sensitivity. **Conclusion:** The dental bleaching and the microabrasion technique promoted satisfactory immediate clinical results that increased self-esteem of the patient in a minimally invasive way to dental structure.

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***Correspondence to:**
Gisele Damiana da Silveira Pereira
Address: Rua Maxwell, 80, apt 1106, Vila Isabel, Rio de Janeiro - RJ - Brasil,
Zip code: 20541-100.
Telephone number: +55 (21) 98142-6000
Email: giseledamiana@yahoo.com

INTRODUCTION

Dental stains, irregularities on the enamel surface and unwanted coloring are clinical conditions that interfere in the smile aesthetics, which can be solved by obtaining clear, aligned teeth with defined anatomical shapes.[1] In this context, the search for aesthetic treatments has increased in all areas of Dentistry. Therefore, researchers are encouraged to develop and qualify materials and techniques for removal of stains and irregularities on the dental surface to achieve satisfactory aesthetics.[1]

Dental fluorosis is clinically characterized by changes in the enamel color, like whitish streaks crossing the tooth surface, opaque white spots and brownish spots to areas where the enamel is intensely hypomineralized, at risk of even rupture.[2] Besides that, has different degrees of severity and the clinical aspect determines the type of treatment to be performed. Thus, the dental microabrasion technique is a conservative therapeutic procedure indicated in cases of mild and moderate fluorosis, however restorative treatments are necessary when there is loss of structure or in extremely unpleasant aesthetic situations.[2]

Aiming to remove these color changes, acids, in different concentrations, the technique known as microabrasion of the dental enamel is used. It is an effective and low-cost alternative for treatment of the surface stains because it allows the problem to be solved with minimal wear on the dental structure.[2]

Therefore, the objective of this paper is report a clinical case in which the aesthetic complaint was solved through the association of the dental bleaching to the microabrasion technique.

CASE REPORT

Male patient, 13 years, attended to the Integrated Clinic of the School of Dentistry of the Universidade Federal do Rio de Janeiro (UFRJ), with his mother, with aesthetic complaint of teeth. Informed consent form signed by the patient's guardian and after clinical examination, it was noted whitish spots on the dental surface, especially on the anterior superior teeth, characterizing the fluorosis (Figure 1). The characterization of the degree of fluorosis presented by the patient was based on the Thylstrup and Fejerskov[3] (TF) index, being defined as TF = 4 (surface exhibits marked opacity or appears chalky white).

Initially, it was applied gingival barrier of light-curing resin (Top Dam, FGM Produtos Odontológicos- SC - Brazil) (Figure 2A) and, next, it was made an immediate bleaching with hydrogen peroxide at 35%[4] (Whiteness HP, FGM Produtos Odontológicos - SC - Brazil), in 3 session of 15 minutes each, to soften the disparity of shades between tooth-stain. The result obtained was insufficient (Figure 2B) and the dental microabrasion technique was applied.

Thus, aiming at a conservative and minimally invasive approach, the treatment chosen was the use of the microabrasion technique, from the handling and application of a phosphoric acid-based paste at 37% (Condac, FGM Produtos Odontológicos - SC – Brazil) mixed with pumice (SS White – RJ - Brazil) of fine grain (Figure 3A), with the purpose to promote the removal of a thin layer of surface enamel safely and effectively in a total of 8 application of 1 minute each (Figure 3B), according to Powell & Craig protocol.[5]

At the end of each application (Figure 4A), it was made abundant water wash, fine-grained disc polishing (Microdont – SP - Brazil) assembled in microengine (KAVO do Brasil Industria e Comercio LTDA – RJ - Brazil) and topical application of neutral fluorine gel (NaF 2% - Nova DFL, Jacarepaguá-RJ, Brazil) during 4 minutes to eliminate possible postoperative sensitivity. The patient returned 2 years later for clinical follow-up and satisfactory aesthetic conditions were observed, performing only finishing and polishing the anterior superior teeth (Figure 4B).



Figure 1: *Initial photo of the smile.*

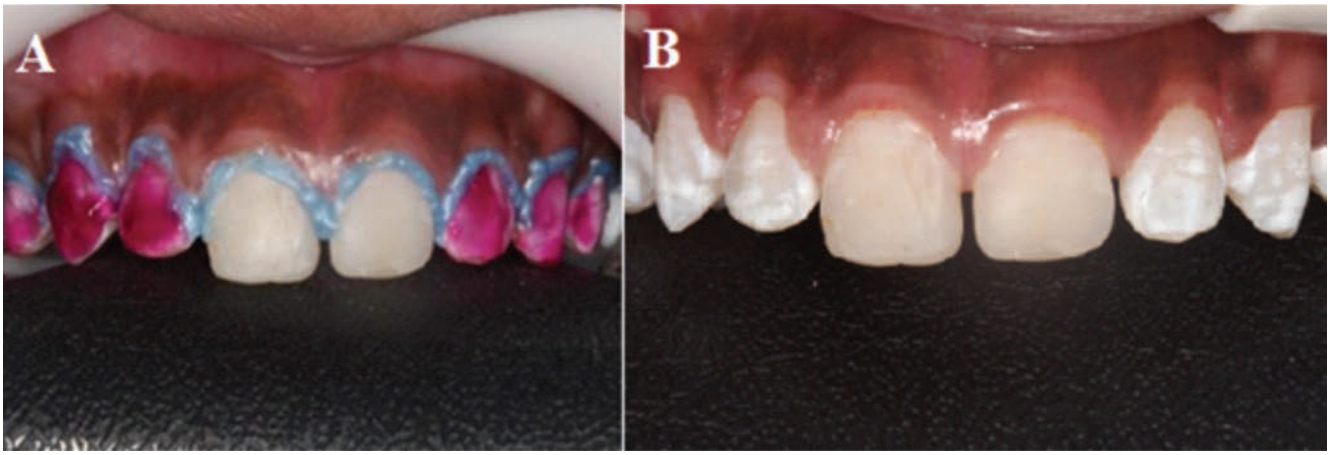


***Figure 2**: (A) Tooth whitening process; (B) Post whitening aspect.*

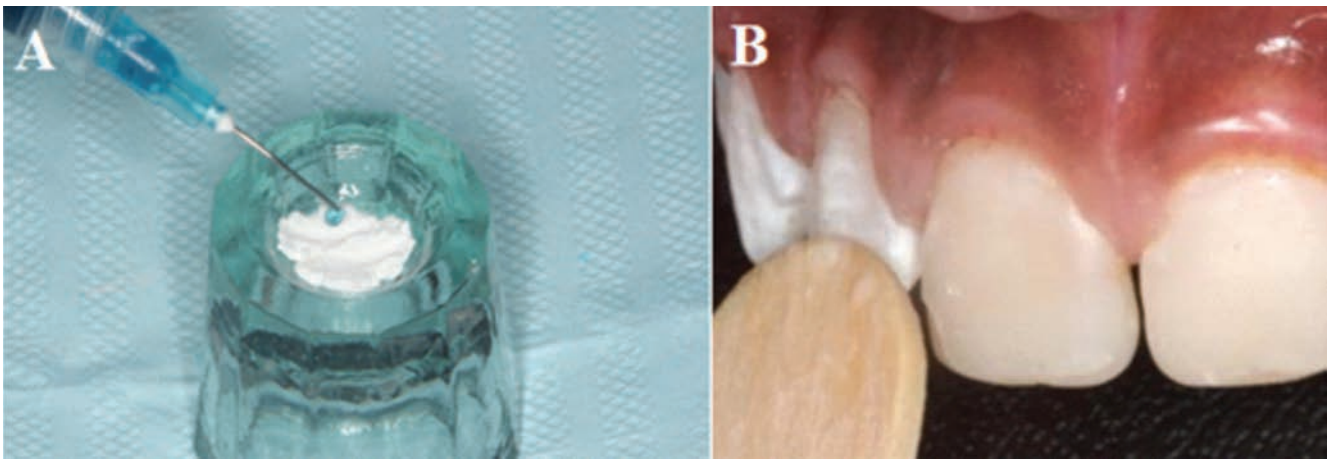


***Figure 3**: (A) Pumice stone with 37% phosphoric acid; (B) Handling with wooden spatula.*

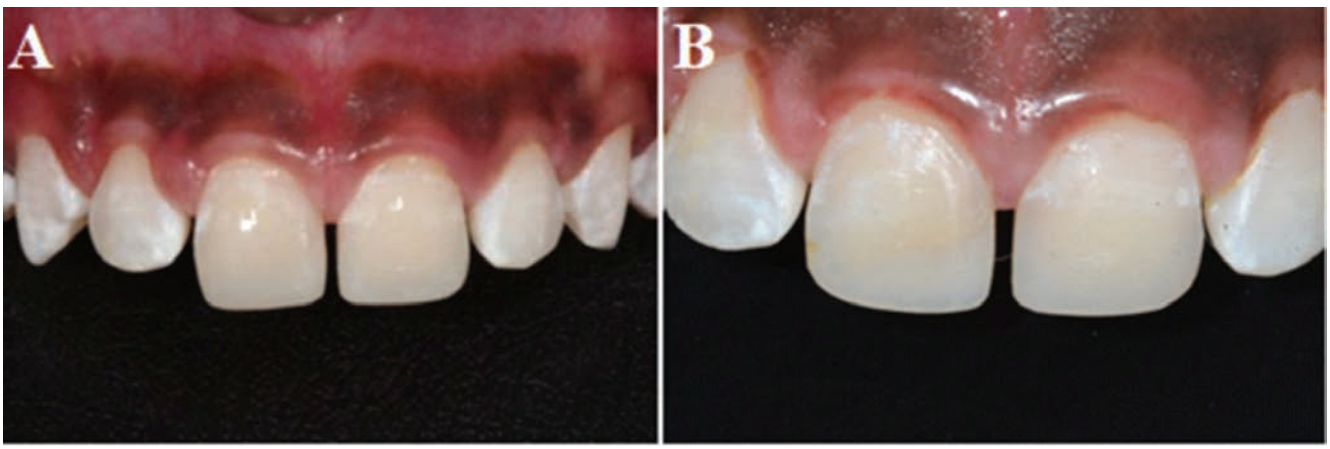


***Figure 4**: (A) Final aspect after microbrasion; (B) Follow-up after 2 years.*

DISCUSSION

Dental developmental defects are associated with intrinsic changes, and the pigment accumulation is related to extrinsic causes. Fluoride, incorporated into public water, table salt, vitamin supplements, toothpastes, mouthwashes and dental floss, is considered a key agent for the control of dental caries, and has been the subject of several researches due to its proven efficacy. However, the excessive accidental ingestion causes structural complications on the enamel surface and, in more severe cases, intoxication.[6]

The aesthetic solution of stains in the dental structure, in different colors, is one of the biggest challenges for the dentist due to the variation in etiology, extension and depth. Previously, these cases of changes in the structure and enamel color were fixed, mostly, by surface wear and restoration.[7]

Close clinical examination and anamnesis contributed to the final diagnosis of white spots suggestive of fluorosis in this clinical case, corroborating the reports of Wray *et al.*[8] about the need of a detailed anamnesis to do the treatment.

In this case report, the complaint of mother and son was associated with the improvement of the smile aesthetic. This way, after establishing the diagnosis and treatment plan, we chose the microabrasion associated with tooth whitening, since the patient had no structural defects in the enamel. The combination of the techniques reduced the stains with minimal loss of the tooth enamel, resulting in a uniform and shiny enamel surface, corroborating the clinical findings of Bussadori *et al.*[4]

In this case report, it was used the enamel microabrasion technique released by Croll & Cavanaugh[9], characterized by the joint action of an erosive agent (acid) and an abrasive agent (stone), showing a deeper layer of enamel with normal characteristics.

According to these surveys, Powell & Craig (1982)[5] reported a technique that was known to be simple, fast and safe since there was no use of caustic materials, and this protocol was adopted for this study. It was used phosphoric acid at 37%, and the stains could be removed in 2 sessions. The acid played a conditioning role. In the first session, it was made a cleaning with pumice and glycerine, application of the phosphoric acid at 37 % in the affected areas around 2 to 3 minutes, washing of the area and polishing with pumice and glycerine.

The hydrochloric acid aggressively wears out the tooth enamel, so it was chose the use of phosphoric acid, promoting a more selective wear, around 5.5 ìm in enamel, besides presenting lower volatility (gel).[10,11,12]

The short treatment time, safety, ease of execution, immediate result and low cost without causing damage to the pulp and periodontal tissues are factors that contribute to the use of dental bleaching and microabrasion (combined or not) by professionals, especially in Pediatric Dentistry, because it is a minimally invasive and conservative technique.[13] The study by Bussadori[4] and Bertassoni[14] states that the most conservative techniques, such as whitening and microabrasion, are used when the tooth has no cavitated or very deep lesions. The data in this case report corroborate with these authors who reported that tooth whitening with 35% hydrogen peroxide can be performed before dental microabrasion, enabling favorable aesthetic results.[15] In this sense, other studies report that the use of tooth whitening with 35% carbamide peroxide as an aesthetic treatment for dental fluorosis in children and adolescents is an effective method that does not cause irreversible damage to the tooth structure, when the dentist has time control and follows the protocol correctly.[16,17,18,19]

Due to the greater depth of the spots that the canines had, it was decided to carry out only two microabrasion sessions in order to avoid any type of damage to the enamel, especially cavitation. As the final aesthetic result was satisfactory, a third session of microabrasion was spared in these elements. The harmonic aesthetic result lasted in the post-treatment. This fact was observed in the follow-up after 2 years of the initial treatment.

As final stage, the subsequent polishing of the dental surfaces was made to maintain the aesthetics and to avoid optical change of the surface, since procedures with acids cause dental dehydration.[19]

CONCLUSION

The correct diagnosis and the combination of techniques enabled an effective aesthetic treatment with satisfactory results, minimally invasive for dental structure.

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