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IP Indian Journal of Conservative and Endodontics

Journal homepage: https://www.ijce.in/

Case Report

Minimally invasive technique for improvement of aesthetic in cases of mild to moderate fluorosis: A case report

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ARTICLE INFO

Article history:
Received 01-02-2023
Accepted 02-04-2023
Available online 25-05-2023

Keywords:
Aesthetic
Fluorosis
Minimally invasive

ABSTRACT

Patients have been increasingly worried about tooth discolouration in recent years, particularly when the maxillary anterior teeth are implicated. Dental fluorosis appears clinically as white patches or opaque white lines, or the tooth surface may have a white, parchment-like look. The brown stains visible in moderate to severe fluorosis are caused by the ingestion of extrinsic stains, primarily from the food. Higher fluoride concentrations cause discontiguous or confluent pitting of the enamel surface, which is accompanied by extrinsic stains.

The aim of this case report is to demonstrate a conservative technique of minimally invasive procedures for esthetic correction in anterior teeth which includes methods like microabrasion, tooth bleaching and resin infiltration carried out in sequence for the removal or masking of fluorosis stains in maxillary and mandibular anteriors.

1. Introduction

Patients have been increasingly worried about tooth discolouration in recent years, particularly when the maxillary anterior teeth are implicated. Clinicians now have various teeth whitening procedures at their options. In dental practice, both in-office and at-home bleaching is often employed.[1,2]

The material used is determined by various parameters, including the type of discoloration existing and the initial colour of the teeth. The patient, his or her lifestyle, the time available for bleaching, and whether or not there are any current complaint of tooth sensitivity must all be taken into account.

In the two principal classifications of bleaching techniques, there are different factors, including the type of bleaching agent and its concentration and application time. Carbamide peroxide (CP), in concentrations somewhere in the range of 10% and 22%, and hydrogen peroxide (HP), in concentrations from 4% to 8%, are shown for home bleaching for delayed periods. In-office bleaching is performed utilizing high-concentrations HP (25% to 50%), which can be light-activated to speed up the bleaching system.[3]

Weerheijm et al (2001),[4] defined white spot lesion as 'hypo mineralization of systemic origin, presenting as demarcated, qualitative defects of the enamel of one to four first permanent molars frequently associated with affected incisors'. White spot lesions are early signs of demineralization which may result in the development of caries.[5,6]

Dental fluorosis appears clinically as white patches or opaque white lines, or the tooth surface may have a white, parchment-like look. The brown stains visible in moderate to severe fluorosis are caused by the ingestion of extrinsic stains, primarily from the food. Higher fluoride

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https://doi.org/10.18231/j.ijce.2023.020

concentrations cause discontiguous or confluent pitting of the enamel surface, which is accompanied by extrinsic stains.

The microinvasive resin infiltration approach is a novel preventive therapy that was created to slow the growth of incipient white spot carious lesions. Following the three-step procedure of etching, drying, and infiltrating the damaged region with a resin, the ultimate product has the favourable effect of hiding the carious lesion.[7]

Resin infiltration enjoys a few benefits, including the shortfall of tooth structure loss, the ability to stabilise white spot lesions, the prevention of caries progression, in the body of the lesion micropore plugs form, the postponement of the need for a restoration, the reduction of recurrent decay, the absence of pulp inflammation and postoperative sensitivity, the decreased chances of periodontitis and gum disease, and better aesthetic results while covering demineralized enamel.[8]

Subsequently, the ongoing case report shows the phases of tooth bleaching, microabrasion, and resin infiltration application as a grouping of strategies for eliminating/concealing fluorosis stains in maxillary and mandibular anteriors.

Fig. 1: Extra oral view of initial aspect of fluorosis staining in the labial surface of maxillary and mandibular teeth

2. Case Report

2.1. Clinical diagnosis

A 26-year male patient reported to the Department of Conservative Dentistry and Endodontics, disappointed with the presence of yellow stains on the maxillary and mandibular anterior teeth.

On inspection, the whole labial surface of maxillary and mandibular front teeth had chalky white opacities and brownish grooves of varying depths and widths.

Three minimally invasive procedures were chosen during treatment planning: microabrasion, high-concentration tooth bleaching, and the application of resin infiltrant.Figure 1

2.2. Enamel micro abrasion

A slurry of 18% hydrochloric acid and fine pumice powder is applied to the buccal surfaces of the teeth on a rubber cup in a typical handpiece revolving at the slowest speed.

The acid-pumice slurry combination should only be applied for 5 seconds before being washed off with an air-water spray straight into an aspirator tip.

Due to the depth of the enamel fault, two sessions were necessary for a better outcome.

2.3. Bleaching of the teeth

One objective of bleaching is to decrease the differentiation between the white and brown coloured stains and the unaffected portion of the tooth, subsequently enhancing colour perception. Subsequently, the treatment was in-office tooth whitening utilising 35% hydrogen peroxide.Figure 2

Fig. 2: Extraoral viewafter microabrasion and bleaching on the labial surface of maxillary and mandibular teeth

2.4. Resin infiltration

The resin infiltrant was applied as per manufacturer's recommendation during the last clinical session. The activity was completed around the same time as the last bleaching session.

Subsequent to creating the islolation by rubber dam, the 15% hydrochloric acid (Icon-etch) was directed for 2

minutes especially on the damaged teeth's surface, wearing the external layer of dental enamel. Following acid etching, the region was cleaned for 30 seconds with the water and dried immediately. Three Icon-etch treatments were necessary, with each application regulating the humidity of the area.

Following the third etching procedure, a 99 per cent ethanol agent (Icon-dry) was utilized to remove the water remaining in the enamel's microporosities, and it was permitted to rest for 30 seconds.

In the wake of utilizing this substance, no white spots were tracked down in similar amounts as already, ensuring that another application was not necessary.

Following that, the infiltrant was put cautiously and unequivocally over the lesion utilizing the fitting instrument, and it was permitted to rest for 3 minutes to allow it to enter all the more effectively and arrive at the remaining microporosities.

A dental explorer was utilized to eliminate the excess. The polymerization of infiltrant was done for 40 seconds.Figure 3

Fig. 3: After treatment completion

3. Discussion

Certain superficial enamel stains, such as those caused by fluorosis, can be efficiently removed with the enamel microabrasion method. However, following treatment, the teeth frequently seem to be more yellow, detracting from the overall outstanding results attained by microabrasion. Further treatment with a home bleaching gel can enhance the overall look of microabrasion-treated teeth.

Infiltrants are photopolymerizable gums with a high infiltration coefficient. This substance enters and fills the permeable holes of the hypoplastic enamel by capillary forces. Resin penetration influences the optical attributes of teeth with enamel hypoplasia, concealing white regions.[9,10]

By and by, at times, the achievement isn't accomplished exclusively with resin infiltration application and requires little wear in the modified enamel to take out or diminish the white and brown colored spot. Thereby, with microabrasion, the amount of enamel removed is related directly to the technique, type of acid applied, and number of applications.[11,12]

Tooth bleaching was directed at first to diminish the dissimilarity between the white spots and the remaining parts of the damaged tooth, and afterward to affirm the need for additional treatment.

At the point when these three different minimally invasive procedures were consolidated, the shading of white opacities was decreased while most of unaffected tooth structure was preserved, uncovering a promising choice for the treatment of enamel hypoplasia particularly when contrasted with more invasive restorative procedures.[13]

4. Conclusion

This new approach looks to be beneficial, but further research is needed before it can be suggested for all patients. Follow-up to check colour stability is still required, and it is critical to further define its therapeutic significance.

As a result, the demand for the resin infiltration technique is increasing over time since it not only offers cosmetic rehabilitation but also permits recovery from hypomineralization.

5. Conflicts of Interests

The authors have no financial interests or conflicts of interests.

6. Source of Funding

None.

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Cite this article: Prachi, Deepanshi, Arya A, Grewal MS, Thapak G. Minimally invasive technique for improvement of aesthetic in cases of mild to moderate fluorosis: A case report. *IP Indian J Conserv Endod* 2023;8(2):107-110.