

Procedures And Adverse Effects Of Teeth Whitening

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Abstract:

Now a days people are giving much more importance to perfect smiles. Expectations about aesthetic appearance has been increasing day by day in the recent times. Aesthetic smiles including tooth colour and appearance is very important to patients. So teeth whitening procedures are one of the most frequently demanded treatment options by public. Besides oral health and hygiene, there is an increasing number of oral care products that focus on teeth whitening. There are various reasons for people to choose teeth whitening as a treatment option which includes: staining of teeth which may include extrinsic or intrinsic stains, to improve their smiles etc. Among all of these, teeth discolouration is the most common cause. Discolouration of teeth are mostly associated with staining. Therefore, excellent approach to discolouration of teeth is teeth whitening techniques. There are various procedures of teeth whitening. Here we are going to discuss about vital and non-vital teeth whitening techniques which is also called bleaching and the adverse effects associated with these procedures. Both vital and non-vital teeth whitening procedures come up in either at-home technique or in-office procedure and over-the-counter modalities. carbamide peroxide, hydrogen peroxide or sodium perborate are the different types of chemical agents that are being used for these procedures which are going to be discussed in the coming sections. These procedures not only produce excellent whitening effects but also some of the adverse effects which are discussed in this paper. Finally, the result of the treatment is whiter teeth and perfect smiles. Dentist plays an important role to bring about a perfect smile on people's face.

Keywords: Teeth whitening, aesthetics, perfect smiles, vital and non-vital bleaching

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I. Introduction:

A good smile is a start for a good day. Facial appearance particularly plays an important role in increasing one's own self-consciousness and self-confidence, When we hear about the word aesthetics and cosmetics, first thing comes to our mind in dentistry is aesthetic proportions. Aesthetics are primarily related to how well individuals are accepted in social groups. Aesthetic proportions are considered perfect, ideal, desirable and asserts a natural balance in specifically the human body. Divine proportion has a value of 1.618(phi). This Golden proportion is found in numerous natural phenomena like leaves, petals, seeds; architectural constructions like Egyptian pyramids; various cephalometric measurements; teeth arrangement and in various stages of Facial growth. Pythagoras proved that the Golden section was the basis for the proportions of the human figure and each part in a definite Golden Proportion to all the other parts.

Teeth plays an important role in physical and facial appearance of a person which increases the overall physical attractiveness of the body image. Aesthetics have become a part of everyone's life due to which the field of cosmetic and aesthetic dentistry is growing and gaining its importance¹. It is not possible for everyone to be the reason for someone's smile other than a dentist. Most important reason for giving importance to teeth whitening is due to stains. Stains may be due to extrinsic staining and intrinsic staining. As we all know, some of the causes for extrinsic staining is bacteria, caries, foods like coffee, tea, alcohol etc. Reasons for intrinsic staining is genetics, medications, fluorosis etc². Let's come to a solution for all of this. Teeth whitening is the only option, that is most conservative for teeth staining. Teeth whitening procedure, also called bleaching, brightens the tooth

colour. We have many procedures of teeth whitening. Although it is said to be conservative, it has its own adverse effects too. Here we are going to discuss about vital and non-vital whitening procedures which are most commonly used in dental offices and we are also going to discuss its adverse effects too.

II. Review Literature:

According to various research studies and researchers, importance to aesthetics is increasing rapidly in this fast growing world. Teeth whitening techniques not only include the vital and non-vital procedures, but also various other methods too. Let us talk about various other methods of whitening agents and procedures. Some of them are whitening tooth paste, whitening mouth rinses, whitening gels, abrasive tooth pastes etc. Discolouration of the tooth can not only be managed by teeth whitening, but also there are various treatment options available like composite restorations. Composite restorations are also widely used as a treatment option for discolouration of anterior teeth. As the results of composite restorations are short limiting and are most widely used for class 1 and class 2 carious lesions, teeth whitening treatment procedures are emerging rapidly. Let us discuss in detail about them in the further sections.

III. Research Methodology:

Teeth staining is one of the most common reason for patients choosing teeth whitening as a treatment option. Teeth staining is of two types: intrinsic and extrinsic staining. Intrinsic staining is also known as internal staining and extrinsic staining is also known external staining. Some of the etiological reasons for both intrinsic and extrinsic staining are provided below²:

INTRINSIC STAINING	EXTRINSIC STAINING
Antibiotics	Smoking
Oral injury	Alcohol
Other medications	Coffee
Genetics	Tea
Fluorosis	Poor oral hygiene
demineralisation	Other food items

Table 1: causes for intrinsic and extrinsic staining

There are various procedures and agents which are used for teeth whitening such as teeth whitening tooth pastes, abrasive agents, chemical agent technique which includes vital and non-vital bleaching techniques etc. We are going to discuss about non-vital and vital bleaching techniques which are provided below:

NON-VITAL BLEACHING	VITAL BLEACHING
Walking bleach technique	In-office bleach technique
Inside/ Outside bleach technique	

Table 2: Different types of bleaching techniques

Non-Vital Bleach Techniques:

1. Walking Bleach Technique:

Coming to walking bleach technique, it is an internal bleaching technique, which involves various steps, in which first, access cavity is prepared in the affected tooth, then a mixture of sodium perborate and 10% to 30% of carbamide peroxide are applied into the pulp cavity and covered with a filling³. This procedure is done until desired tooth colour is achieved. Hydrogen peroxide can also be used for this procedure, but may also pose risks and adverse effects.

2. Inside/ Outside Bleach Technique:

When coming to inside/outside bleaching technique, access cavity is prepared like the walking bleach technique, alginate impressions are taken for the patient and a splint/mouth guard is fabricated. Then 10% carbamide peroxide is applied on the tray and we ask the patient to insert the tray at night, excessive bleaching gel is removed. Recall is recommended for at least two to three days to see if the colour changes³. It can be done until the desired colour is achieved.

Vital Bleach Techniques:

1. In-Office Bleach Technique:

Coming to vital bleach technique, it involves in-office teeth whitening which is most commonly done in dental offices. But coming to vital bleach technique, it should be done more cautiously as it is being done on the vital teeth. Certain precautions need to be taken while performing this procedure to prevent the aerosol droplets exposure to both patient and the dentist. Protective eye glasses should be worn by both of them. After certain precautions are taken, the next step is to insert a rubber dam. After insertion of a rubber dam, then 30% of

hydrogen peroxide is applied on teeth for 15-20 minutes and then rinsed out⁴. In most of the cases, gingival barrier or liquid rubber dam are preferred. Results are improved day by day. Not only advantages, but they do have adverse effects. Some of the adverse effects includes gingival irritation and burns due to hydrogen peroxide toxicity. Not only this but cervical root resorption is most commonly observed in non- vital bleaching technique. Increased sensitivity is also observed after vital bleaching technique.

IV. Findings And Discussion:

The present paper is concerned about different procedures of vital and non- vital teeth whitening, risks and adverse effects associated with them. Some of the adverse effects are discussed below:

Adverse Effects:

Hydrogen Peroxide Toxicity:

Hydrogen peroxide involves oxidation reaction which may cause gingival irritation, irritation to skin and mucous membrane and also leads to burns when exposed to higher concentrations⁵.

Cervical Root Resorption:

Another most common adverse effect is cervical root resorption. Cervical root resorption is most commonly observed in non- vital teeth whitening procedures. Cervical root resorption is also known as inflammatory mediated external root resorption⁵. Cervical root resorption is also caused due to high concentrations of hydrogen peroxide. When high concentrations of hydrogen peroxide are used, it stimulates the inflammatory mediators in the periodontium which may lead to an inflammatory mediated external root resorption.

Increased Teeth Sensitivity:

Another most commonly observed side affect is increased teeth sensitivity. Increased teeth sensitivity is observed in vital bleach technique in which high concentrations of hydrogen peroxide or carbamide peroxide are used⁶. Not only these there are other adverse effects which includes roughness of the tooth surface, demineralization and colour change of previous restorations etc. Let us discuss one by one in detail.

Surface Roughness:

Recent studies shown that, teeth whitening is also associated with another risk known as surface roughness. Highly concentrated chemical agents use in teeth whitening contributes to surface roughness of tooth structure⁷.

Demineralisation:

Enamel is the hardest part of human body. Dentin contributes to the majority of the tooth structure. Use of high concentrated chemical acids like hydrogen peroxide and carbamide peroxide are known to cause the demineralisation of enamel and the underlying dentine layers, which in turn leads to increased sensitivity of tooth structure⁸.

Colour Change Of Previous Restorations:

Previous studies shown that as we include chemical agents in both vital and non-vital teeth whitening, it may also leads to the change of colour of the previous restorations⁹.

We use different chemicals for teeth whitening procedures such as sodium perborate, carbamide peroxide, hydrogen peroxide etc. But comparatively, sodium perborate has lesser risks when compared with other two. When compared between vital and non-vital procedures, relatively, there are lesser adverse effects and risks associated with non- vital procedures. Coming to the three techniques discussed above, walking bleach technique is the least invasive one. Not only least invasive but it is the most convenient technique for both doctors and patients¹⁰. Every thing in dentistry has some advantages and disadvantages as we discussed about the risks and side effects of teeth whitening procedures.

V. Conclusion And Further Research:

Perfect smiles affects the psychological well- being and quality of people's life. Dentist is the only one who can bring about smile and joy in patient's lives. Everything in dentistry has it's own importance and risks as we discussed in case of vital and non- vital whitening procedures. Finally, we conclude that, walking bleach technique is the most affordable, convenient and least invasive of all the procedures discussed above. When compared to vital and non -vital techniques, the procedures for non- vital teeth are least invasive and produces desired effect and aesthetics.

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