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Pre-Bleaching Exam Vital for Optimum Whitening

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The most critical factor in the tooth whitening process is proper examination prior to initiating bleaching treatment.¹ The examination is necessary to correctly diagnose the cause of discoloration in a timely fashion.

Questions to be answered as a result of the examination include the following:

1. Is bleaching the treatment of choice, or is another treatment more appropriate for this condition?
2. Should other treatment be performed prior to bleaching, either for discoloration improvement, or to avoid sensitivity or poorer esthetic outcomes?
3. Should other treatment—whether essential or optional—be performed after bleaching to achieve the smile the patient desires?
4. Of the bleaching options, which procedure is best suited to the condition exhibited by the patient’s dentition, concerns, finances, and lifestyle?

A proper pre-bleaching examination should include both a clinical and radiographic component in order to address all possible etiologies of discolored teeth. If the patient is a patient of record, radiographs of the anterior teeth may already exist. However, since most anterior caries is more easily diagnosed from transillumination, and only posterior caries requires radiographs, even a patient of record may only have posterior bitewing radiographs.

In the absence of anterior radiographs, dentists should consider a “screening radiograph” of the incisors. This radiograph can usually be obtained with a single bitewing film rotated longwise to

obtain a periapical radiograph to screen for pathology. However, any single dark tooth or teeth should have a periapical radiograph taken to check for any apical pathology or resorption.

RADIOGRAPH PLAYS KEY ROLE

The purpose of the radiograph is to evaluate for apical pathology, which may have never resulted in any pain, swelling, mobility, or other clinical symptoms or signs other than discoloration. After trauma, teeth may take up to 20 years before demonstrating evidence of apical pathology,² showing little or no symptoms. Teeth that have been subjected to trauma may become slightly darker, with or without pulpal death.³ Pulp testing may be indicated, although in the absence of clinical signs of an abscess or symptoms of pain, the tooth with nonvital pulpal status is still preferable for bleaching treatment rather than endodontic therapy.

Even more critical regarding the radiograph is that internal or external resorption be determined. Teeth with resorption, however, are also associated with trauma and may still be vital, just discolored.⁴ Only a radiograph will reveal the resorption, and oftentimes aggressive endodontic therapy will be required to save the tooth. Any loss of time due to improper diagnosis of the cause of discoloration may result in the ultimate

loss of the tooth. Periodontal surgery may be required for access to the resorption, or orthodontic extrusion with crowning may be needed rather than bleaching.

The radiograph is also used to determine if the tooth has experienced calcific metamorphosis, where the pulp chamber has been obliterated by secondary dentin. Such teeth may indicate a positive or negative response to vitality testing, but, again, in the absence of radiographic evidence of an abscess or clinical symptoms of pain or swelling, no endodontic therapy is advised.^{5,6} However, the patient will need to know that this situation may take longer to bleach and achieve the desired result. Also, a special tray may be appropriate to first treat that tooth alone to determine the maximum color change that can be obtained.

As in a typical dental examination, the radiograph will also screen for abnormalities such as tumors or cysts, which may be affecting the color of the tooth, as well as caries. Supernumerary teeth may be present and may compromise endodontic therapy options.

The clinical examination will include an evaluation for caries, in addition to screening soft and hard tissue for cancer, abscesses, or other abnormalities and pathology. Caries may be present interproximally or lingually and cause the facial surface of the tooth to appear dark. Also, the discolored tooth could be a result of a discolored restoration. The clinical examination should identify exposed root surfaces, since the root does not bleach in the same manner as the anatomic crown. Because the root does not change color as readily as the crown, stronger discolorations at the gingival interface will be less responsive to bleaching. White spots should be identified, because they cannot be removed by bleaching.^{7,8} When white spots exist, the goal is to lighten the rest of the tooth such that the white spots are less noticeable.

Also involved in the clinical examination is the esthetic evaluation of the



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patient's smile. This includes the amount of the teeth that is showing and whether or not the patient has a gummy smile. Typically, short teeth and a gummy smile do not look better with bleaching, as the whiter teeth accentuate the gummy smile. Periodontal plastic surgery would be better indicated first. Defects in gingival architecture and cross-arch harmony should be addressed, as these will tend to be more noticeable when the teeth are whiter. Because patients tend to look best when the color of their teeth match the white portion of their eyes, matching patients' teeth to their eyes serves as a better endpoint than trying to achieve a certain color on a shade guide.⁹

Because exposed roots do not bleach, the patient should be prepared for a less-than-ideal outcome if this condition presents itself. Existing esthetic restorations, whether composite or ceramic, do not change color. Patients should be informed of any additional treatment that may be needed to replace these restorations should they not match the new tooth color.

The patient should also be evaluated for translucent incisal edges on the anterior teeth, often called a "bluish" halo. Some teeth become more opaque with bleaching while others become more translucent, which can accent this area. One way to determine whether the bluish area of the tooth is translucent or discolored is to place a white-gloved finger behind the blue area. If the discoloration goes away, it is translucency; if the discoloration stays, it is discoloration, which will generally respond well to bleaching.

The patient could also have translucency from lingual erosion of the teeth, resulting in thin enamel incisal edges. This situation may be associated with medical issues and may require additional bonding to protect dentin from further erosion. If the patient is a bruxer and has worn the incisal enamel thin, then bonding may not be an option due to occlusal factors.

Another cause of a similar discoloration involves tetracycline-stained teeth.

Dentistry has often thought of tetracycline staining as only occurring during tooth formation, but recent reports have cited minocycline, a common treatment of acne, as staining fully formed adult teeth.¹⁰ Tetracycline-class drugs such as minocycline are deposited in the secondary dentin and secreted in the saliva to absorb into the tooth, much like an iron stain. There is no good substitute for minocycline, so patients will need to continue taking it for acne treatment; therefore, initial bleaching treatment may take longer, and retreatment may be needed after a number of years.

OTHER ISSUES TO CONSIDER

Questions about history or presence of sensitivity should be addressed. Patients with sensitive teeth should use the lowest concentration of bleach in the tray technique. They will need instructions on brushing with desensitizing toothpaste containing potassium nitrate, placing desensitizing materials containing potassium nitrate in the tray, and proper treatment techniques to minimize or avoid sensitivity. Pre-brushing for 2 weeks with a desensitizing toothpaste before bleaching is initiated can reduce sensitivity. Bleaching should not be initiated the same day as a prophylaxis, as the teeth and gingiva may be more sensitive.¹¹

An occlusal evaluation of the patient will identify any temporomandibular joint issues, as well as how close to ideal occlusion the patient's dentition is. Different tray designs or wear times may be appropriate for both issues. Using a single tray on one arch minimizes the occlusal insult, as does shorter in-office treatment options. Using a single tray also minimizes tooth sensitivity and gives the patient a way to determine progress and have a lower entry cost.

Teeth that have received endodontic therapy present a myriad of options. They can be bleached from the inside, outside, or both. Special single-tooth trays are indicated to determine whether the single dark tooth will lighten sufficiently

to justify lightening the remaining teeth. Material in the pulp chamber should be removed, because it influences the color of the tooth. Teeth with silver points are best undisturbed unless the patient is willing to retreat the endodontic therapy if the silver point is contacted (which breaks the apical seal).

Once a thorough examination has been completed, including radiographs, the dentist can render a proper diagnosis of the cause of discoloration and prescribe the appropriate treatment.

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