The "Natural" Evolution of Teeth Whitening

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SINCE EARLY HISTORY, HUMANS HAVE BEEN KNOWN to take care of their teeth. There is in fact proof that even the Neanderthals practiced brushing and cleaning. Though they're primarily used to chew food, after all, our teeth have a no less important social role: as the major element of our most direct means of communication, the smile.

Tooth cleaning and whitening developed in tandem over the years. The awareness that whiter teeth are more aesthetically pleasing dates all the way back to ancient history. Four thousand years ago, for example, the Egyptians produced a whitening paste comprising a mixture of ground pumice stone and white vinegar. Curiously, the ancient Romans mixed their toothpaste with human urine, having come to the realization that the ammonia in urine is effective as a whitening agent. Even today, some tooth-whitening products contain ammonia.

In the Middle Ages, barbers — the "dentists" of the time — used strong acids to whiten their patients' teeth. While these materials indeed rid the teeth of plaque and whitened them, they also destroyed their enamel, causing eventual decay.

It was not until 1884 that hydrogen peroxide was introduced as a bleaching agent. Since then, the demand for teeth whitening has significantly increased, and modern bleaching is now performed worldwide.

Whitening materials we now use:

- Materials based on carbamide peroxide: These materials break down chemically into hydrogen peroxide and urea, which later transforms into ammonia carbon dioxide.
- Materials based on hydrogen peroxide, which breaks down chemically into radical oxygen ions and water.

Radical oxygen ions released from the formula are the active whitening agent.

Over the past three years, I have been using Natural+™ (formerly White+™) from Meodental in my private practice. Although this product is based on hydrogen peroxide, as are many other products, it is unique. Natural+™'s distinctive characteristic, which has been patented, lies in the stabilization of hydrogen peroxide. This is extremely difficult to obtain without a link to metals, even heavy metals. The unique formulation of Natural+™ has solved this problem.

Because of this, Natural+™ has been able to overcome the following drawbacks of products based on hydrogen peroxide:

1. Hydrogen peroxide tends to break up rapidly and exponentially, hindering continuous oxygen release over an extended period of time. In the Natural+™ product, a single application is sufficient, as it remains active throughout the treatment. In addition, its bleaching effect continues for up to 12 hours after the treatment has ended, making the customary need for several reapplications redundant.

2. In a formula based on hydrogen peroxide, it is difficult to maintain an adequate level of minerals — such as calcium, fluoride and potassium nitrate — to enable significant mineralization during whitening, as the hydrogen peroxide tends to dissolve immediately. The stabilized condition of Natural+™ makes this possible without weakening the product's long-term effectiveness.
3. In the absence of heavy metals, and given the high water concentration in the Natural+™ formula, teeth dehydration is avoided, considerably reducing sensitivity and preventing post-op regression in the whitening results.

Case Report
A 30-year-old woman came to the clinic for aesthetic advice. In the preview examination, the patient was very concerned about the color of her teeth (A-2 Vita Shade), her old restorations, the irregularity of her teeth and the level of the interdental contacts. I took clinical pictures, impressions for wax-up and Rx to complete the examination.

Case Presentation
A week after the aesthetic analysis was completed, I presented the following treatment plan to the patient:

Stage 1: Treating teeth discoloration with power (chair-side) bleaching using Natural+™ from Meodental.

Stage 2: Removal of old restorations.

Stage 3: Covering the four anterior teeth with porcelain laminate veneers to create a perfect alignment and correct the levels of the interdental contacts.

Bleaching Appointment
After a visit to the clinic's hygienist, the patient was ready for the whitening procedure. Power Prep, a cleaner and desensitizer gel, was applied for 10 minutes, using a mouth retractor and cotton pads for isolation. After a thorough rinse, the wet isolation pads were replaced by fresh ones.

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Resin gingival protection was then applied to the gums. Note that it is very important to dry the gums perfectly prior to application using light cure at 500mW for 10 seconds.

Once the gingival protection had polymerized, bleaching gel was applied. In its new packaging, the gel is mixed by connecting the syringe of the whitening formula with the syringe containing an activator and minerals. Alternately shifting the gel from one to the other several times results in a homogenous gel. Application is very easy and quick.

Optionally, a thin transparent film may be used to cover the material, thus ensuring that the oxygen is absorbed in the teeth and does not evaporate.

The light used, too, is different than in other systems on the market. The device produces two wavelengths: The first, blue LEDs at 470nm, sets off the chemical reaction and controls the release of oxygen ions. The second, red LEDs at 660nm, reduces soft-tissue sensitivity and facilitates the absorption of the minerals in the teeth. The device has several programs optimized for different clinical cases and materials.

For the present case, I used the progressive program for 27 minutes and then added another 27 minutes without replacing the material. At the end of the treatment, I verified the color with the Vita Shade guide. What had been an A-2 shade was now B-1.

Once this was achieved, the teeth could be prepared for the porcelain laminate veneers. I waited 10 days to make sure that the color did not regress and that the shade was fully satisfactory for the patient. I then took an impression and prepared provisionals.

A week later, I bonded the porcelain laminate veneers and then took a final impression in order to prepare bleaching trays for future maintenence touch-ups. The resulting shade maintained the natural vivid appearance of the patient's teeth. Fast, sensitivity-free results like these are the primary reason I exclusively use Natural+™ for all whitening procedures in my practice.■

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