

## Case Report

# Combining In-Office and Tray Whitening to Treat a Difficult Case

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## CASE REPORT

A 42 year old, women presented to the "Clinical Research Clinic" (the Clinic) of the Medical College of Georgia (MCG), School of Dentistry [now Georgia Regents University, College of Dental Medicine]. She was concerned about the color of her teeth, Figure 1 and was referred to the clinic for evaluation. She was interested in changing the color of her teeth but feared she was not a good candidate for a whitening procedure.

## HISTORY

She reported an interesting and complex history: About 20 years earlier her daughter, a toddler, accidentally hit the top of her head against the incisal edges of the patient's maxillary anterior teeth. Examination at the time showed no damage or loss of vitality to any of the teeth. Over the next 20 years the teeth darkened at different rates, creating a worsening esthetic problem. At periodic examinations during these years various practitioners had been fairly negative about the likelihood that whitening would improve her situation. Most recently she had been advised that she should definitely not whiten her teeth because the right central incisor (#8) would not respond while the other teeth would. Thus whitening would only increase the contrast between the central and the other teeth. She was also informed that the central had a crack that required a full coverage restoration. She had also been told that crowning the maxillary anterior teeth was the best way to solve her problem, but she simply could not afford it. As a result of this history, she had become increasingly frustrated and pessimistic about her treatment options over the years.

She was at the MCG dental hygiene clinic that day for a prophylaxis and a second opinion regarding crowning the "cracked", central incisor. The supervising hygiene faculty was a co-investigator in the Clinic and had participated in several clinical trials on whitening. She referred the patient to me to see if I thought there was anything that could be done to whiten her teeth.

## CLINICAL EXAMINATION

Clinical examination confirmed that all teeth in the maxillary anterior were vital and there was no radiographic evidence of pathology. The crack line on the central appeared to be superficial; the patient reported no sensitivity in day-to-day

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activities and had a normal response to testing with the Tooth Slooth ® (Professional Results, Inc.). The right lateral incisor (#7), the left central incisor (#9) and the left first premolar (#12) were all considerably brighter and less chromatic than the other teeth in the arch. The right central incisor #8 was darker and more chromatic than the rest of the teeth in the arch. Using a value-order, Vita Classical shade guide, tab C3 was chosen as generally matching the color of the teeth in the arch.

## Treatment Recommendation and Prognosis

Due to the general darkness of the teeth and the multiple shades in the anterior segment, it was clear that the treatment period would be extended. Given the patient's history and her reasonable pessimism about the likelihood of success, it was important that she be able to see an initial result almost immediately. This would give her more confidence that treatment would be successful and build the enthusiasm towards treatment required to sustain consistent participation over the extended treatment time. Accordingly a combination of in-office whitening followed by tray-whitening was recommended. More specifically, in-office treatment with a light-activated, 25% hydrogen peroxide whitener (Zoom 2; Discus Dental) would be used to selectively whiten numbers 6, 8, 10 and 11, while being careful not to whiten numbers 7, 9 and 12, which were already brighter than the other teeth in the anterior segment (Figure 2). I chose to use Zoom 2 and light activation because I had the equipment. Any high concentration whitening agent that did not include light activation would have worked as well.

This treatment would be followed with at-home, tray whitening. The patient was advised that the prognosis for whitening the maxillary teeth was good. She was also advised that her situation was so unique that it was difficult to anticipate how successful treatment would be in terms of obtaining a uniform color for the maxillary anterior teeth. Accordingly she was advised that, for this aspect of treatment the prognosis was guarded. We discussed the placement of ceramic veneers as a way to assure a more uniform shade throughout the anterior segment. I advised her that whitening the teeth before veneers placement would be necessary to assure a good prognosis,



Figure 1 Initial Presentation.



Figure 2 Selective Whitening with Zoom 2.



Figure 3 Immediate Post-op Shade Following Third In-office Treatment.



Figure 4 Modified Whitening Tray.

because placement of veneers on darker teeth would result in more opaque, less natural looking teeth. She decided to proceed with whitening and re-assess the need for placement of veneers once that was complete.

## Treatment

Over three appointments one week apart the in-office procedures were completed. The appointments consisted of three 15 minute applications of the 25% hydrogen peroxide. At the second appointment a maxillary impression was made, and a whitening tray was fabricated prior to the third appointment. Immediately following the third in-office treatment session the general shade of the maxillary teeth had changed from C3 to C1, a change of eight tabs (Figure 3). However, teeth numbers 7, 9 and 12 were still brighter than number 8.

When asked her impressions of the in-office procedure she reported that she could tell her teeth were definitely whiter following the very first visit. She said the isolation materials were not very comfortable and that she was a little uneasy at first. But she was quickly able to relax and tolerated treatment well. She also noted that she had no tooth sensitivity from treatment, but did have minor discomfort from the gums tissue. This went away in four or five days.

The next phase of treatment was at home tray whitening with 16% carbamide peroxide (Nite White 16% w ACP; Discus Dental). The tray was modified to prevent loading the gel in the area of number 7, 9 and 12 by simply cutting away the facial and lingual walls of the tray (Figure 4).

At home whitening continued for ten weeks, at first with the modified tray and later with a tray that covered all the maxillary teeth. During this time the patient was evaluated every two weeks. Once teeth numbers 7, 9 and 12 were a good match for the maxillary teeth generally, the patient was provided with a



Figure 5 Final Result of Combination In-office and Tray Whitening Procedures.



Figure 6 Baseline and Final images.

full tray. While the maxillary teeth generally whitened nicely and attained an even color match, tooth number 8 continued to have significantly more chroma than the others (Figure 5). Continued efforts at whitening only resulted in this tooth becoming brighter than the other teeth. It also remained obviously more chromatic

than the other teeth. The baseline and final images demonstrate a result that is a great improvement (Figure 6), but not ideal. The patient was pleased with the final result and decided against pursuing placement of a veneer for tooth number 8.

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