Sometimes a particular case comes along that appears at first to be overwhelming. This case fits that description (Figures 1 and 2). However, when this patient emailed my office and inquired about the possibility of flying across the country to have me treat him, I had fortunately done many cases involving hundreds of teeth using the matrix system that I developed to treat dentitions afflicted with black triangles, albeit none of this magnitude. Although this case presented many questions and the additional challenge of severe facial abrasions, I felt absolutely confident that we could achieve a good outcome. The trick was to disassemble the case into bite-sized pieces.

**PREVALENCE AND PATIENT ATTITUDES**

One third of adults have unaesthetic black triangles, which are more appropriately referred to as open gingival embrasures\(^1\). Besides being unsightly and prematurely ageing the smile, black triangles are prone to accumulate food debris and excessive plaque\(^2\). A recent study found patient dissatisfaction with black triangles to rank third among aesthetic defects, following carious lesions and dark crown margins\(^3\). This demands more attention from our profession. The caveat is that, until now, there has been no disciplined, minimally invasive approach for treatment. Today, instead of improvising and struggling, I have developed a specific and predictable protocol to treat this problem.

**LOWER INCISOR AESTHETICS**

The aesthetics of the lower teeth are often overlooked or simply ignored by many dentists. Recently, a fellow passenger seated next to me on a flight was intrigued by the photos on my laptop. He asked, 'Why do dentists only seem to treat the upper teeth when the lower teeth look all jacked up? Do they think no one notices?

Lower incisors present their own unique restorative challenges. The incisal edge is broad and thin mesiodistally. The root, in contrast, is very broad buccolingually. Imagine a butter knife that has been permanently twisted at 90° in the middle of the blade. This anatomic curiosity creates demanding draw/path of insertion issues for a porcelain laminate or full crown preparation. A lower incisor with significant recession leads to a mutilatory tooth preparation for porcelain. When I had an opportunity to show this case to the top ceramists in Toronto and Seattle, their answer was: 'Dr Clark, to treat this case properly with porcelain laminates would require you to mutilate these teeth.'
Like many clinicians, the patient’s dentist hadn’t heard of Clarkmatrix, and was unfamiliar with injection moulding of composites, so he was cautious of treating with bonding. At that point, the patient decided to find a different solution because porcelain veneers and periodontal surgeries did not appeal to him as ideal treatments.

After he saw my ‘Black triangle’ and ‘Restoratively driven papilla regeneration’ articles and videos on the internet, he opted to fly to the west coast for treatment.

First, I consulted two renowned microscope-equipped periodontists. I would have normally immediately excluded the surgical option based on this patient’s situation, but because of the severity of the embrasures attrition, I felt that second and third opinions were warranted. In addition, if a follow-up surgical approach was needed, the periodontist would already be on board.

Noted periodontist Dr Peter Nordland’s summary of this patient was: ‘The papilla height across the lower anterior teeth is located at the same level as all of the other adjacent papillae. This means that the individual papillae are not deficient but, instead, the patient has suffered incisal edge wear and extrusion of the incisors. Although root coverage could be very predictable, I would recommend a restorative solution. My experience is that surgical papilla reconstruction is most predictable in situations where the papilla has been surgically abused previously.’

CASE PRESENTATION

Figure 1 shows the magnitude of the black triangles on the lower incisors. The patient’s first priority was treating this section, and he would return to the west coast in a few months to treat the upper black triangles. Facial abrasions and recession tripled the complexity of treatment (Figure 2). Blasting, which is application of a mild abrasion with an air-water mix, is an absolute necessity for this treatment (Figures 3-6). Once the facial abrasions are restored up to the line angle areas, a rubber dam is placed. The interproximal areas are nicely managed with the dam and the DC-203 Clarkmatrices together (Figures 7-13). To try to treat the facial abrasions at the same time that the matrices are in position is not recommended.
The Clarkmatrix method is almost the inverse of the old flat matrix technique. The facial surfaces are left with some excess, as this is the loading area. The interproximals, when loaded, will require little or no finishing (Figure 14). Immediate postoperative views demonstrate the dramatic emergence profiles, mirror finish and regenerated papillae (Figures 15 and 16), and the results are clear at the six-month follow up (Figure 17).

Dentists and periodontists often ask these patients, 'Are these veneers or crowns?' No. This is done with an injection moulded technique, performed with high level magnification using a universal nanocomposite (in this case, Filtek Supreme Ultra, 3M Espe) (flowable and paste) into the Clarkmatrix, and polishing all with Jazz Polishers (SS White).

**SUMMARY**

Before the Clarkmatrix and a disciplined approach to composite treatment of black triangles, many treatments ended with significant compromise in periodontal health. Many cases debonded soon after placement and others suffered problems with stain. Nonetheless, our patients are hopeful for a better solution. The interdental papilla serves as both a functional and aesthetic asset. Anatomically ideal interproximal composite shapes that are mirror smooth can serve as a predictable scaffold to regain this valuable gingival architecture. Clean enamel surfaces can be leveraged to retain the restorations permanently. This elective procedure shouldn’t be carried out without magnification, a strict adherence to dentin detoxification with a blasting appliance, or using a flat matrix. In these circumstances, non-treatment or referral is recommended. Our profession can now change its thought processes, retrain its hands and expand its armamentarium to perform techniques that were previously impossible.

**REFERENCES**


For further information about Clarkmatrix, please contact its UK distributors Optident Ltd on 01943 605 050 or visit www.optident.co.uk

Clarkmatrix and its related products are known as Bioclear in the US.

To ask a question or comment on this article please send an email to: comments@ppdentistry.com