As a general dental practitioner, I frequently see patients with white spot lesions on the labial and buccal surfaces of their teeth. They can be the result of many things, including mild fluorosis and long-term fixed orthodontic treatment where the patient has had poor oral hygiene around the brackets.

Consequently, it can be disappointing for a patient, who has spent quite a long time receiving orthodontic treatment, to find that the final result has been spoilt by what they consider unsightly white spots all over their teeth.

White spot lesions can be caused by mineral loss under a pseudo-intact surface layer. Cariogenic acids dissolve minerals from the enamel, thereby affecting the refractive index and creating the unsightly white spots.

Until recently, there was not a particularly acceptable treatment for such situations, where the white spots are so superficial.

Minimally invasive therapy
Fortunately, DMG has now introduced Icon – a minimally invasive therapy, specifically designed to stop the progression of incipient caries and eliminate white spot lesions. It can be used to treat lesions both interproximally and on smooth surfaces.

DMG’s Icon allows the masking of white spots by modifying the optical properties of the tooth. The hypomineralisation caused by the fluorosis or early enamel caries alters the refractive index of healthy enamel. Icon resin has a refractive index close to that of healthy enamel, so, when infiltrated, it allows the lesions to mimic the translucent properties of healthy enamel better.

In the following case study, I will describe the use of Icon to treat labial white spot lesions.

Case study
A 20-year-old female patient presented complaining of white spots affecting her upper anterior teeth (UR4 to UL4). She had previously tried a course of home tooth whitening, but this did not get rid of the white marks to her satisfaction.

Treatment options were:
• Tooth whitening – the patient had already tried whitening at home and was not satisfied with the result
• Resin infiltration
• Aesthetic composite resin veneers
• Laminate veneers.

The patient asked me to remove the white spots on her teeth and it was decided that fillings or veneers would be too invasive (Figures 1 and 2).
With the patient's permission, it was decided that the white marks would be treated using Icon (caries infiltrant smooth surface).

**Protocol**

As you will be working with a strong acid, it is important to isolate the soft tissue from the area you will be working on. In this case, teeth UR4 to UL4 were isolated with rubber dam (Figure 3). Note the gingivae around UL2, which was not covered properly by the dam. This area is visibly inflamed in the immediate postoperative photographs, though it subsequently made a full recovery.

The areas to be treated were coated with Icon-Etch (Figure 4), which is a 15% hydrochloric acid gel, for two minutes before being washed off to leave the typical post acid etch frosted appearance (Figure 5).

Following rinsing and drying, the lesions were then completely dehydrated using the Icon-Dry ethanol solution provided. Icon-Dry has a refractive index significantly nearer to that of healthy enamel than air. After it has been applied, while it is still wet, you are able to ‘preview’ the effect on the white spot lesion to see if it has been thoroughly masked or not (Figure 6).

If the white spot lesion is still visible during the first few seconds after the Icon-Dry has been applied, and it is still wet, then the etching step using Icon-Etch (followed by application of Icon-Dry after each etching step for a ‘preview’) can be repeated once or twice, in order to mask it more effectively. Please note, once the Icon-Dry has dried, the white spot becomes visible again. The etching step was repeated twice in this case.

The hydrophobic Icon resin was then applied to the teeth using an Icon Vestibular-Tip (Figure 7) and left to infiltrate for three minutes. The contacts were then flossed and the excess resin removed from the labial surface using a cotton wool roll. Each tooth was then light-cured for 40 seconds (Figure 8). This resin application process was then repeated.

After application of the Icon resin, no further reduction in the white spot is possible.

The rubber dam was then removed. Note the rough appearance of the teeth immediately following curing (Figure 9).

The teeth were then polished using the same methods used to polish composite restorations.

**Final outcome**

As can be seen in the final photographs (Figures 10-12), the white spots are not completely gone, but there is a vast improvement over the original situation. The patient was thrilled with the result, as she now had the smile she wanted without having to resort to any tooth preparation.