‘how to’ technique

How to handle white spot lesions associated with orthodontic treatment.

BACKGROUND...

It is well recognised that the placement of fixed orthodontic appliances increases a patient’s risk of developing white spot lesions.  

In terms of an aesthetic final result, the appearance of the upper anterior teeth in particular is important.

The facial surfaces of upper anterior teeth are normally not high caries-risk sites. However, with brackets and arch-wires in place, effective plaque removal becomes more difficult and the likelihood of enamel demineralisation increases.

The first visible sign of decay is a white spot lesion and, if present in an aesthetically sensitive area, it can compromise a satisfactory finish to a case.

DURING TREATMENT...

A recent study found that around 70% of patients develop at least one white spot lesion during orthodontic treatment.

To avoid this situation, instructions to patients for home care usually focus on the need to keep the area around each bracket free of plaque plus brushing with a fluoride toothpaste (see next page).

As shown opposite it appears that around one quarter of patients follow instructions diligently, almost 70% follow them to some extent and, with the remainder, compliance is poor.

Across the spectrum, the compliance with additional measures during orthodontic treatment, such as the use of a fluoride mouthrinse, is invariably quite low. One study found that only 15% of orthodontic patients rinsed with a fluoride solution each day as instructed.

An approach for the non-compliant patient.

Boys are more likely to ignore home care instructions and have more white spot lesions than girls. If a patient’s compliance is extremely poor, the orthodontist may have no option but to remove the fixed appliances.

However, there is one method that has been found extremely useful. It requires no patient compliance and has been shown to reduce the incidence of white spot lesions by around 70%.

Source: www.dentaloutlook.com.au
How to handle white spot lesions associated with orthodontic treatment. (cont)

An approach for the non-compliant patient. (cont)

Technique:
Immediately after the placement of brackets, and each 6 weeks afterwards at adjustment appointments, a coating of Fluor Protector (Ivoclar Vivadent) is placed on high-risk areas. Fluor Protector contains 0.1% fluoride which gives a 10 times higher fluoride concentration on the tooth surface after the varnish has dried.

In contrast to some other fluoride varnishes it has the advantage of being clear and therefore less obvious. It is quick drying and requires a short application time.

The usual target areas are around the brackets on the upper anterior and premolar teeth.

AFTER REMOVAL OF BRACES...

Treatment if white spot lesions are present.

1. Basic program:
In the first few weeks following de-banding there is usually a significant reduction in the size of white spot lesions and, by 6 months, roughly half will have remineralised naturally. 6

However, from the outset, a basic program involving the use of a fluoride toothpaste and good oral hygiene should be implemented and maintained.

Signs that improvements are occurring are:
• A gradual ‘blending in’ of the white spot lesion with adjacent sound tooth structure.
• A reduction in lesion size.
• Replacement of a chalky white lesion surface with a more shiny one when the surface is dried.

2. Supplementary measures:
• Although not all studies have shown a benefit (see opposite), the daily use of a CPP-ACP (Tooth Mousse - GC) preparation should be considered as a supplementary measure to the use of a fluoride toothpaste.
• Application of high fluoride preparations such as 2% sodium fluoride or a 1.23% acidulated phosphate fluoride gel are not indicated. 7 This is because the reaction products can block the diffusion pathways into the body of the sub-surface lesion and so inhibit ‘in-depth’ remineralisation.

In a motivated patient the daily use of Tooth Mousse (GC) can be a useful supplement to brushing with a fluoride toothpaste. 8,9 However, the comparable product with added fluoride, Tooth Mousse Plus, has not yet been shown to be effective as a supplementary measure. 10

Source: www.dentaloutlook.com.au
If white spot lesions persist.

If white spots persist for 6 months or more and are an aesthetic concern for the patient then there are a few options:
- Tooth whitening to camouflage the white spot lesions.
- Microabrasion followed by tooth whitening.
- Resin infiltration of white spot lesion with a low viscosity resin.

Tooth whitening:
It has been found that inactive white spot lesions bleach less than adjacent sound enamel during tooth whitening procedures. The end result is that they can merge with the adjacent enamel to create a more uniform appearance.
A combination of in-surgery and at-home whitening has been found to produce good results. (If the patient wears a mouthguard-type retainer then it can act as a tray for the at-home bleaching gel).
A point to note is that initially, the white spot lesions may lighten more than the adjacent sound enamel and cause some concern. However, with time, the situation is invariably reversed.
Precautions:
- The lesions must be inactive and have a shiny (not a dull and chalky) appearance after drying.
- Patient must be at least 14 years of age or, preferably, older.
- Oral hygiene and compliance must be of a high order.

Comment: A very conservative approach which may be all that is required to improve aesthetics.

Microabrasion:  
The microabrasion technique involves removing a superficial layer of enamel and then using tooth whitening to finish the case.
There are two techniques that can be used. One utilises a combination of mild hydrochloric acid and abrasive for surface enamel removal (example product Prema - Premier) and the other employs a mixture of 34-37% phosphoric acid gel and pumice.
Usually this is followed up with tooth whitening. However, in some cases, just the application of Tooth Mousse (GC) may be all that is needed.
How to handle white spot lesions associated with orthodontic treatment. (cont)

If white spot lesions persist. (cont)

Microabrasion:

- Technique with phosphoric acid/pumice:  

1. A standard phosphoric acid etching gel is added to pumice powder to produce a very thick paste.

2. The mixture is used in a rubber cup. The surface is polished for 3 minutes in total with the mix being replenished frequently.

3. Tooth whitening.

Check the colour of the tooth when polishing is finished. If the shade is darker as shown (left) then tooth whitening should be considered.

Microabrasion: (cont)

Precautions:

- Rubber dam is required when using the hydrochloric acid/abrasive system.

If microabrasion is to be followed up by at-home tooth whitening:

- Patient must be at least 14 years of age or, preferably, older.
- Oral hygiene and compliance must be of a high order.

Comment: As long as it is used judiciously, microabrasion is a minimally-invasive technique that should be tried before other options such as direct laminate veneers are considered.

Resin infiltration:  

Another possible approach is to etch the white spot lesion surface with 15% hydrochloric acid and infiltrate the lesion with a very low viscosity light-curing resin (example product Icon - DMG).

A clinical case report indicated that very severe lesions could not be masked using this technique. However, less severe lesions became invisible or only visible after drying.

Comment: No longer-term clinical evaluation of the technique was found. A question to be answered is whether the resin develops any yellowing with aging; a phenomenon that can occur with organic materials.
How to handle white spot lesions associated with orthodontic treatment. (cont)

**SUMMARY...**

For non-compliant patients during period fixed appliances are in place.

- Apply the clear, low viscosity varnish **Fluor Protector** (Ivoclar Vivadent) to vulnerable sites at each 6-week adjustment visit.

If white spot lesions are present after fixed appliance removal.

- Around half the lesions will resolve naturally in around 6 months.
- Effective brushing with a fluoride toothpaste is required.
- The standard **Tooth Mousse** (GC) may be a useful supplement to brushing with a fluoride toothpaste.
- If a lesion persists for longer than 6 months and is an aesthetic concern, then tooth whitening or microabrasion may be considered. Tooth whitening is the most conservative of the two approaches.

**References:**