Non-surgical periodontal bone regeneration

Rana Al-Falaki, specialist in periodontics looks at how laser treatment can provide an alternative to surgery, even for deep periodontal pockets

Non-surgical periodontal therapy is an incredibly effective way to manage periodontitis. Generally this consists of oral hygiene instruction, supra-gingival scaling, root surface instrumentation, and removal of any plaque retentive factors, such as overhangs and caries. The expected outcome is to significantly reduce inflammation, so you would want to see a considerable reduction in sites bleeding on probing, no suppuration, an overall reduction in pocket depths and of course ideally, no remaining pockets at all, so no areas probing >3mm.

If we follow the research, the suggestion is that this is a good and successful treatment modality for pockets up to 7mm without furcation involvement, and if the pockets are greater than this, then surgical treatment is found to be an appropriate next step. It also doesn't work particularly well in pockets associated with vertical bone loss, which are known as infra-bony defects. As part of any surgical management in such cases, you would consider a regenerative procedure involving accessing the site, removing calculus and granulation tissue, placing a regenerative material into the defect followed by sutures, possibly a periodontal dressing and also possibly antibiotics. The morbidity following periodontal surgery can be quite high, with post-operative bruising, bleeding or swelling, tooth sensitivity and pain. Of course it is time consuming and costly to the patient.

Case study

This case illustrates a minimally invasive non-surgical technique, which avoids all these negative aspects, and at the same time, can achieve the periodontal gold-standard - that of spontaneous bone regeneration without the need for surgery.

A 56-year-old lady presented with localised deep pockets that had not improved following non-surgical treatment with a hygienist and despite regular three-monthly hygienist visits for years, she was still experiencing pain and discomfort from two particular areas, where the gums tended to swell and suppurate. She was aware of persistent bleeding on brushing and a bad smell. The diagnosis was found to be localised advanced chronic periodontitis, and the two particularly problematic areas were tender and suppurating pockets associated with UR4 (9mm), and also LR6 (11mm) (Figure 1), both of which were mobile and related to areas of vertical bone loss. There were 44% bleeding sites.

She was treated non-surgically, following by deep pocket therapy using laser in the same visit. This is a non-surgical application using a Waterlase MD Er,Cr: YSGG laser. The tips used in periodontal pockets are 14mm long and even thinner than a periodontal probe. They are radial firing, blasting water laterally.

The additional advantage of using this laser is that it removes biofilm, creates a smooth root surface which attracts fibroblasts, helps to permanently desensitise the tooth, removes granulation tissue and sets up an environment conducive to spontaneous bony infill.

She presented two months later with complete pocket resolution, only 1% BOP, no pain or sensitivity, and all the teeth were firmer. This remained stable at the one year follow up. No surgery was necessary and the radiographs (Figure 3 and 4) showed bony-infill on the distal aspect of LR6, which significantly improved its prognosis long term. Traditional treatment would have involved the need for more invasive bone grafting surgery in this case.

Figure 1: LR6 with 11mm suppurating pocket before treatment

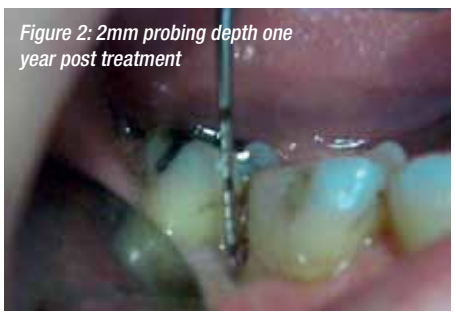

Figure 2: 2mm probing depth one year post treatment

Figure 3: Infra-bony defect on distal aspect of LR6 showing up to 70% bone loss

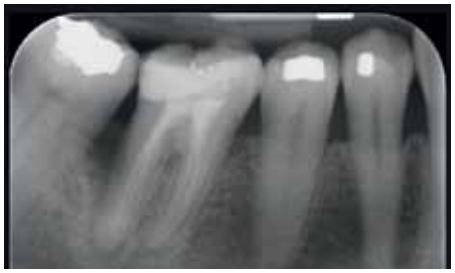

Figure 4: Bony in-fill into infra-bony defect on distal aspect of LR6, one year post treatment

Rana Al-Falaki has been on the UK specialist list in periodontics for over 10 years. She has worked in the hospital system helping with the undergraduate and post-graduate tuition, and as an associate specialist. She was the first UK periodontist to use lasers in her daily practice. She is conducting research on its applications and also lectures both in the UK and internationally on the subject and is pioneering its use in this field.