



Use of an alloplast (Synergy) and application of a dental sealant (SANOS) to treat furcation bone loss with follow-up at 8 and 14 months

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Periodontal disease is often defined as the loss of gingival tissues and epithelial attachment resulting in pocket formation and furcation exposure. Periodontal disease is initiated by sub-gingival plaque accumulation (bacteria) and progression of attachment loss is accelerated by stimulation of the host's immune system (neutrophils, immunoglobulins, cytokines etc.).

In the majority of small animal practices, teeth with deep periodontal pockets, alveolar bone loss and furcation exposure are extracted; but with correct diagnosis, dental radiographs, and specific materials, these teeth can often be successfully treated and saved. In an ideal situation, following placement of an alloplast, a strict homecare program should be instigated to ensure successful long-term results, including new bone formation, elimination of furcation exposure and re-attachment of the epithelial tissues. In this case study, the owner was not able to achieve regular homecare and long-term success was still achieved.

Case Study

Wombat, a 13yo, desexed, female Dachshund dog was referred to our clinic for treatment of recurrent halitosis in January 2017. She had been treated by the referring veterinary clinic with regular teeth scaling and polishing, however no homecare plan was successfully implemented. Pre-anaesthetic health check using IDEXX in-clinic machines showed an increase in pre-renal BUN. All other parameters and general clinical examination were within normal parameters. Wombat was admitted, commenced IV fluids and anaesthetised for an oral examination. A dental chart was completed. Dental probing indicated generalised gingivitis (increased bleeding on probing), plaque and calculus accumulation, gingival recession and attrition. Particularly relevant to this case, oral examination confirmed previously extracted maxillary 4th premolar, 1st and 2nd molar teeth bilaterally; increased periodontal probing depths (7 – 9mm on the buccal surface) and furcation (F2) exposure, plaque/ calculus accumulation and gingival recession of 309 (Figure 1).



Figure 1. Photograph of the left side of Wombat's mouth demonstrating increased plaque and calculus accumulation. Note: Gingival inflammation of 309.

A left inferior alveolar nerve block was placed using 0.3mls mepivacaine 3% plain. Complete supra- and sub-gingival scaling was performed using an ultrasonic scaler followed by polishing with fluoride free pumice. The pumice was removed with a fine jet of water. Dental radiographs using Sopix2 digital sensor of 309 showed horizontal alveolar bone loss (Figure 2).



Figure 2. Radiograph 309 showing horizontal bone loss and furcation exposure.

An envelope flap of the buccal gingiva adjacent to 309 was elevated using a Molt 2/4 periosteal elevator. Open root planing using a miniature Gracey 1/2 curette debrided the root surfaces of endotoxins, diseased cementum/dentin, plaque and calculus. The exposed roots were polished with fluoride free pumice and washed with a fine jet of water (Figure 3).



Figure 3. Photograph 309 after envelope flap and root planing was completed. Note: furcation exposure and radiograph sensor placed lingually.

Once visually clean, an alloplast comprising hydroxyapatite and beta tricalcium phosphate (Synergy) was placed into the furcation defect (Figure 4). The flap was replaced and finger pressure applied for 2 minutes, air dried and SANOS dental sealant applied with a brush subgingivally. The gingival margin was attached to the tooth enamel using a thin smear of tissue glue over the buccal surfaces using a microbrush (Figure 5). The other teeth were then air dried and SANOS dental sealant applied into the gingival sulcus.



Figure 4. Photograph showing placement of Synergy into 309 furcation defect.



Figure 5. Photograph showing position of envelope flap after replacement

A post-op radiograph showed the furcation completely filled with the alloplast (Figure 6). Wombat recovered from anaesthesia uneventfully. She was discharged the same day with metronidazole 100mg PO bid, Amoxicillin/clavulanic acid 91.75mg PO bid, and instructions to apply a pea-size drop of Maxiguard Oral gel to the flap bid and feed soft pieces of meat for 14 days. A re-visit appointment was scheduled for 14 days post-op, at which time, the flap was confirmed to be in place, the gingiva healthy and a homecare program,

including using a fingercloth with Maxiguard, was discussed. The patient was scheduled for an oral examination and radiographs, under anaesthesia, for six months post-op. Contact was made with the owner at regular intervals, which confirmed homecare was not being performed. Due to geographic challenges, the client could not return to our clinic for regular homecare, so we organised with the referring clinic to make twice weekly appointments to have the nurses use a fingerbrush and Maxiguard for plaque control. This schedule wasn't adhered to.



Figure 6. Radiograph 309 after placement of Synergy

Follow-up at eight months.

Wombat was re-assessed in August 2017, eight months after the initial procedure. Pre-anaesthetic health check using IDEXX in-clinic machines again demonstrated an increase in pre-renal BUN. All other parameters and general clinical examination were within normal parameters. Wombat was admitted and anaesthetised using the same protocol as previously described. A dental chart was completed. Dental probing indicated normal sulcus measurements, generalised

gingivitis and calculus accumulation associated with all teeth. In particular, the previously treated molar tooth (309) was found to be covered in plaque and calculus, as the owner had found that homecare was not possible. Of note, the buccal surface of 309 had normal 2mm sulcus depths, with no entry of the probe into the furcation and no pocket formation. Radiograph of the tooth confirmed formation of alveolar bone within the furcation and maintenance of adjacent alveolar bone height (Figure 7).



Figure 7. Radiograph of 309 eight months after initial placement of Synergy demonstrating alveolar bone formation, filling of the furcation and maintenance of adjacent alveolar bone height.

A complete supra- and sub-gingival scaling was performed using an ultrasonic scaler followed by polishing with fluoride free pumice. The pumice was removed with a fine jet of water. The teeth were dried and SANOS dental sealant applied. Again, the importance of a homecare program was emphasised, but the owner unable to perform mechanical homecare due to dexterity issues, agreed to attempt to use Maxiguard oral gel orally as often as possible.

Follow-up at fourteen months.

Wombat was again scheduled for a six month follow-up, which was 14 months after the initial treatment. As stated before, homecare was administered intermittently and most probably in a haphazard manner. This was confirmed with discussion with the owner and on oral examination of the patient, where the teeth were covered in calculus and plaque (Figure 8).



Figure 8. Photograph of the left side of the mouth demonstrating plaque and calculus accumulation.

As per previous protocol, Wombat was admitted and anaesthetised, oral examination performed and a dental chart completed. Of interest was the observation of minimal gingivitis and reduced bleeding on probing compared to previous examinations. Of significant importance, normal probing depths on the buccal surface of the previously treated mandibular molar tooth (309) were recorded. Especially considering there was no opposing maxillary 4th premolar tooth and the lack of adequate homecare performed. The teeth were scaled and polished and SANOS applied as previously described (Figure 9).



Figure 9. Photograph post scaling and polishing demonstrating minimal gingival inflammation associated with 309.

A radiograph of 309 was taken to check the alloplast (Figure 10).



Figure 10. Radiograph of 309 fourteen months after initial placement of Synergy showing maintenance of alveolar bone in the furcation and adjacent alveolar bone height.

Conclusion.

Wombat's periodontal disease is typical of her breed. An aged Dachshund dog fed a soft diet, owned by a client unable to perform satisfactory home-care. The accumulation of plaque in turn stimulates the host's immune system resulting in gingivitis, gingival recession, pocket formation, and eventually tooth loss.

In this case, by utilising an alloplast placed into a cleaned Type 2 furcation defect, replacement of the gingiva and application of a dental sealant, we achieved new bone formation, elimination of bacterial penetration into the supportive tissues of the tooth, reattachment of the epithelial tissues and re-establishment of normal gingival sulcus measurements.

Of significant note, in this case, despite accumulation of supra-gingival plaque, there was minimal evidence of gingivitis and long-term continuation of normal sulcus probing depths.

Wombat demonstrated that despite minimal homecare, the combination of an alloplast and a dental sealant can be used to maintain oral health and dentition.

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