Population and process
In mid-2014 there were 11.4 million people aged 65 years and over in the UK, and this number is increasing. With advanced medical and dental techniques more people are keeping their teeth into old age rather than becoming edentulous. Unfortunately root caries is the most common cause for tooth loss in this age group.

There is a wide range in the reported prevalence of root caries from around the world, ranging from 29-89%. In the UK 20% of adults aged 75-84 years-old had active root decay in 2009. The number of tooth surfaces affected by root caries per year is estimated to be 0.47-1.0 surfaces. Therefore even taking the most conservative approach we can estimate there are 1.1 million root caries lesions per year in the UK over 65 years-old population. This has a high financial and biologic cost; when we lose teeth it affects our ability to eat comfortably, diminishes self-confidence and quality of life. However, the good news is that if actively treated, root caries can be reversible.

Although gingival recession is not unique to older populations it is more common with age. For caries to occur on the root of the tooth there needs to be loss of gingival attachment, exposing the cementum and root dentine. With active root caries the dentine becomes softened and discoloured. The lesion does not necessarily cavitate but can spread circumferentially around the root preserving the pulp.

Like enamel caries the lesion can be “active” or “arrested”. And while arresting caries is our objective it must be remembered that in time, and a change in a patient’s health or circumstances, the lesion or parts of the lesion, may become active again so on-going maintenance is necessary.

The process of caries in root dentine is quite different to that of enamel. The difference in behaviour is not really surprising when we consider the biomaterial structure of enamel and dentine. Root dentine is made up of organic substance (largely collagen) forming a scaffold into which the inorganic minerals of calcium phosphate are maintained as apatite. As gingival recession exposes the root dentine and metabolism of carbohydrates by bacterial plaque produce acidic conditions on the root surface so mineral ions of calcium and phosphate are removed from the dentine. This opens up the organic collagen scaffold, which can limit further demineralisation of the deeper layers of dentine producing a demineralised deep zone of dentine and more highly mineralised surface layer. Roots are more prone to caries as demineralisation can occur at a higher pH (pH 6.2-6.4) than enamel (pH 5.5-5.7).

At this stage the carious process is reversible as the mineral ions can return by “remineralisation”. However, if the collagen scaffold is broken down by either enzymes produced by the bacteria or naturally occurring in the saliva, then the collagen is lost, cavitation occurs and if this structure is to be reconstructed then a dental restoration in composite or glass ionomer is often required.

Probing or scaling an active root caries lesion is not recommended as damage to the highly mineralised surface layer allows a pathway for bacterial invasion into the demineralised deeper layer. Current interventions to prevent and arrest root caries have been aimed at remineralisation of the dentine and preservation of the collagen scaffold to avoid the need for dental restorations. If a dental restoration is required then this does not mean that the patient is “cured” as root caries is as likely to occur around the new restoration if the prevailing conditions for caries are not corrected.

The factors that increase these risks are multiple and include high intakes of fermentable carbohydrates, poor oral hygiene, decreased saliva quality and quantity, the presence of plaque retentive factors such as a denture, crowded dentition or poorly adapted restorations.
The BSDHT Council would like to invite any interested BSDHT members to apply for the role of Council Observer.

Council agreed that it would make the work of the BSDHT Council more transparent to members if Council meetings were to be opened to invited observers.

A number of members of the Society may attend full Council meetings purely as observers, although numbers will be limited due to space. Applicants will be accepted on a first come basis and no expenses will be paid. Meetings are held twice a year in Rugby.

The next meeting will be held on Wednesday 13th September 2017.

To register your interest please contact the President, Helen Minnery on 01788 575050 or email enquiries@bsdht.org.uk
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However, by the time it is necessary to place a restoration the tooth is compromised and the patient is more likely to suffer further root caries. The loss of function and aesthetics can make complex dentistry necessary with placement of crowns dentures or surgical root coverage procedures. But, to carry out restorative dentistry in isolation to the long term provision of maintenance at home would be futile.

Figures 4-5: Neglected dentition with gross caries leading to diminished general health, function and quality of life. Images pre-treatment show loss of vertical height of occlusion, angular cheilitus and a large tongue with patient having severe gag reflex compromising his oral hygiene leading to extensive root and coronal caries.

Figures 6-7: Following investigation of teeth and caries control a number of teeth were extracted. In the maxilla a partial denture replaced 21-25 and the other teeth were restored with crown and bridgework. In the mandible bridgework replaced 41-32; 33-35 and implants were used on the lower right (44, 46) to avoid a partial denture in the mandible. Composite was used to restore 42, 43. However, the starting point was oral hygiene, caries stabilisation before complex therapy was undertaken.
Figures 8-9: Oral hygiene excellent now in the maxilla although partial dentures are associated with greater risk of root caries. Splitting restorations into smaller units allow greater potential to deal with failure so patient restored with a single crown 12 and 3-unit bridge 13-15.

Figures 10-11: Improvement in dental health allowed implant therapy in site 44-46 and composite bonding to restore 42 and 43, maintaining tooth structure and avoiding crowns where possible.

Figures 12-13: At first 3 and 6 month recall with hygienist the oral hygiene was excellent. However at 9 months plaque accumulation was noted and reinforcement of cleaning regime with motivation to clean areas of early caries at 43 before general cleaning undertaken. High fluoride toothpaste (5000ppm) regime used daily and professional cleaning on three monthly basis.

Part 2 will report on the findings of an anonymous survey of 110 dental hygienists’ and therapists’ attitudes towards the treatment and prevention of root caries.

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References