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# Dental Management of the Elderly Patient

**Abstract:** The dental management of the elderly individual is becoming more of an issue in both general dental practice and specialist prosthodontic practice. This is because, in general, the population is living longer and often elderly patients are retaining their natural teeth into their old age. In addition, there are often related significant medical, social and oro-dental issues that require consideration.

**Clinical Relevance:** The dental management of the elderly patient is an increasing problem. This paper seeks to consider the main relevant issues pertaining to this important subject area.

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## Demographic factors

The population of the UK was approximately 52 million in 1992, of which 16% were over 65 years of age. By 2001, the population of the UK had risen to just under 59 million.<sup>1</sup> It is predicted by some authorities that the over 65-year-old age group will increase by approximately 30% over the next 25 years and that the number of patients in the over 85 years age group will rise even more dramatically.

The Adult Dental Health surveys completed over the last forty-or-so years have consistently shown that the rate of edentulism in England and Wales has decreased from 37% in 1968 to 6% in 2009. In addition, there is further evidence from these surveys that elderly patients are retaining their natural teeth into their older age.<sup>2</sup>

There is, however, a difficulty in regarding the 'elderly' as one homogeneous patient cohort. Despite the fact that some authorities divide the over 65 years age group into classifications, such as the 'young old', the 'old' and the 'old old', dependent on their numerical age, a more appropriate viewing of the older patient cohort might take into account the 'biological' age of the patient, not just their numerical age. In other words, most experienced dental clinicians will recall having treated very young-looking, relatively healthy, numerically (in years) 'old' patients, as well as also treating relatively frail-looking,

chronically-ill, numerically 'young' patients. The notion that the numerical and biological ages of 'elderly' patients are not always coincident is very evident in modern dental practice.

## Social factors and access to dental care

There are often significant social factors associated with an elderly patient's situation. Many elderly patients live on their own and, for a variety of reasons, might suffer from mental, as well as physical conditions. Females tend to live longer than males and so there is a significant cohort of widowed, sometimes depressed, females within the population. If a patient is depressed, they might be taking one of the many anti-depressant medications that can have the potential side-effect of causing xerostomia. In addition, many of these patients have transport problems and might have to rely on public transport for journeys to the local food shops or supermarkets. If such transport difficulties exist, the individual might only be able to carry relatively light (in weight) food, and so, more healthy (heavier) food choices, such as fruit and vegetables, might not be made.<sup>3</sup> This can have obvious adverse nutritional consequences. In addition, lighter foods that are transported in this way and consumed are often sugary, and so more cariogenic. Hence, it is not only the very young who might be prone to dental caries but, for this latter reason, the older age group of patients might also have a significant susceptibility to the disease.<sup>3</sup>

An elderly patient's living arrangements is also a source of social concern that can influence his/her access to oro-dental care. An elderly patient might be:

- Living on their own, in their own home;

- Living with family, in the familial home;
- Living in sheltered accommodation;
- Living in a residential home;
- Living in a nursing home;
- Long-stay in a hospital.

In addition, an elderly patient's situation may vary in terms of his/her relative independence. In this regard, he/she may be regarded as totally independent; frail, but with some independence; or 'functionally' dependent.<sup>4</sup>

It has been shown that there are specific issues for elderly individuals who are resident in nursing homes, with regards to the sometimes variable standards of dental advice and care available.<sup>5</sup> In all of the living circumstances listed above, there might be significant constraints on the individual's ability to access appropriate dental management.<sup>3</sup>

## Medical factors

As many elderly patients are living longer, they often present to the dentist with an array of concurrent medical conditions. It is important to note that it is not an automatic consequence of advancing years that an individual will necessarily become ill, but many medical conditions are more prevalent in older age. Such conditions include hypertension, diabetes mellitus, myocardial infarction, stroke and arthritis, to name but a few. In general, as one becomes older, healing becomes more delayed and the major organs and body systems become more susceptible to malfunction or disease.

In addition to physical ailments, elderly patients can suffer from a variety of mental illnesses, including depression, dementia and Alzheimer's Disease. An elderly

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**Figure 1.** Oro-dental presentation of a patient suffering from significant xerostomia.



**Figure 2.** Denture-associated stomatitis of the upper denture-bearing area.

patient is often prescribed a plethora of medications by general medical practitioners to manage many conditions ('polypharmacy'). Many of these medications have the potential for a variety of side-effects and, arguably, the most relevant of these potential side-effects for the dental clinician is drug-induced xerostomia.

Another aspect of an elderly patient's physical status that should be taken into account, especially when considering the provision of dentures, is the ability of a patient to accommodate or habituate to differently designed prostheses. This ability seems to diminish with age. Hence, even subtle changes in the design of a denture can appear to bring about disproportionate degrees of intolerance on the part of the patient, especially if they are of significantly advancing years.<sup>6</sup>

## Xerostomia

As a condition relevant to this subject area, xerostomia requires separate consideration (Figure 1). There are many potential causes of xerostomia, including:

- Post- salivary gland irradiation;
- Medical conditions, such as diabetes mellitus;
- Syndromes, such as Sjögren's syndrome;
- Drug-induced/associated xerostomia.

Perhaps the most significant cause of xerostomia, owing to the increasing numbers of patients involved, is that of drug-induced xerostomia, often as a result of 'polypharmacy'. Many medications have the potential side-effect of causing dry mouth, including antihypertensives, antidepressants, antipsychotics and so on. In fact, there are now

several hundred medications that have this potential side-effect, and this figure is rising year-on-year.<sup>7</sup>

Xerostomia has significant effects on the oro-dental health, depending on its severity. The general intra-oral adverse effects of xerostomia include:

- Eating difficulties;
- Swallowing difficulties;
- Speaking difficulties;
- Oral discomfort;
- Oral ulceration;
- Oral infections.

The specific intra-oral conditions and difficulties that xerostomia can cause include:

- Coronal caries;
- Root surface caries;
- Toothwear problems ('chipping') etc;
- Restoration failure;
- Partial denture problems;
- Overdenture problems;
- Complete denture problems;
- Denture-related infections.

## Mucosal issues

The intra-oral mucosa can become more susceptible to various conditions with increasing age (Figure 2). The more common mucosal conditions that are associated with advancing years include:

- Candidosis;
- Denture-related candidosis;
- Angular cheilitis;
- Oral ulceration of various aetiologies;
- Premalignant mucosal lesions.

The susceptibility of the oral mucosa for inflammation and infections, and its generalized friability and decreased ability for repair with increased age, mean that the prosthodontic clinician has to take these aspects of the patient's management more into consideration than when treating younger patient counterparts.

## Dental plaque control

Elderly patients often have a decreased ability to implement satisfactory oral and denture hygiene. This can be for a variety of reasons, but perhaps the most obvious reason is when a patient suffers from rheumatoid arthritis affecting the hands. In these cases, the patient's ability to complete even simple oral hygiene practices is almost impossible. For such patients, simple strategies, such as adding silicone 'handles' to a manual toothbrush can help. In addition, chemical means of dental plaque control can be advised to supplement physical methods of plaque removal.<sup>8</sup>

When advising elderly patients with regards to their oral hygiene, therefore,

such factors should be taken into account and unrealistic expectations on such oral hygiene standards should not be made. This is especially true of interdental plaque control, which can be particularly difficult to execute for an elderly patient with rheumatoid arthritis.

## Root surface caries

As evidenced by ancient skull studies, root surface caries was present in ancient populations. Some authorities regard it as potentially *the* adult dental caries of the future. Root surface caries is apparent in the ageing population as there is an increased retention of natural teeth generally into older age within the population, often with a concomitant loss of periodontal attachment, and so exposed root surface, through periodontal disease.

There are various difficulties associated with root surface caries. There is relatively little longitudinal (incidence) epidemiological data available for root caries rates across populations.<sup>9</sup> It was only in the Adult Dental Health Surveys of 1998 and 2009 that root caries was meaningfully scored and so, in comparison with coronal dental caries, relatively little is appreciated about the *rate* of the disease in the UK over the last 40 years. Risk assessment for the disease can be imprecise and there are associated relatively poorly-defined, non-evidence-based prevention and management strategies.

Root surface caries is a significant cause of restoration failure in the elderly patient. For root surface caries to occur, there has to be, by definition, a pre-existing loss of periodontal attachment, which often manifests as gingival recession, exposing the underlying cementum or dentine root surface, for instance, at furcation sites. As previously described, elderly patients often have a relatively cariogenic diet, and so these exposed root surfaces, which can be difficult to clean effectively, are particularly susceptible to cariogenic attack.<sup>3</sup>

One should recall that the tooth substrate that will be subject to cariogenic attack in the root caries process is root surface cementum or dentine, which is significantly less mineralized than the tooth's corresponding enamel. Cementum or dentine has a higher 'critical pH' than that of enamel, and so, during a cariogenic attack, demineralization occurs at an earlier stage in the Stephan curve than that for enamel and has a duration prolonged in the Stephan curve compared with that for enamel. In addition to this (and in contrast to the enamel caries process), there is a proteolysis of organic matrix involved in the root caries process and there can be early



**Figure 3.** Root surface carious lesions.



**Figure 4.** Significant toothwear in a partially-dentate patient.



**Figure 5.** Resorbed lower edentulous ridge.

microbial penetration of dentinal tubules if they are patent. This often brings about a so-called multi-focal inception of the root caries lesion; a 'wide', but not necessarily 'deep', caries lesion which can be difficult to restore (Figure 3).

#### Periodontal disease

Several decades ago, periodontal disease used to be believed to be a natural consequence of ageing. We now know that this belief is inaccurate, although it is true to say that chronic periodontitis often presents in the more mature patient. This can be a problem to manage, especially in the light of the patient's often significantly compromised oral hygiene abilities. As a result of periodontal disease, teeth are often lost, which can cause prosthodontic difficulties and, as discussed in the previous section, root surface caries can be an associated issue.

#### Toothwear

Teeth wear with age. Perhaps one reason that toothwear appears to be more of a problem now than it used to be a few decades ago is that elderly patients are maintaining

their teeth into their old age (Figure 4). Hence, attrition is often evident. If medical or gastric problems present, then dental erosion is often a concomitant problem. Dental abrasion can also be evident. Severely worn teeth can be retained as overdenture abutments, whereas less worn, but still significantly worn teeth, can present a very difficult restorative and prosthodontic management problem.<sup>10</sup>

#### Denture provision

There are many reasons why denture provision in the elderly individual is arguably more of a challenge now than it was a few decades ago. The provision of removable partial dentures in elderly individuals can present specific clinical problems. These are considered elsewhere in this series.

The provision of complete dentures in elderly patients can be fraught with clinical difficulties. Alveolar ridge resorption in significantly advanced age, especially in the mandible, can be notoriously difficult to manage (Figure 5). Indeed, as iterated in the recent McGill Consensus<sup>11</sup> and York Consensus,<sup>12</sup> if all clinical issues are favourable for a patient, then the contemporaneous view is that the optimum method of restoring the edentulous mandible is with a two implant-supported overdenture.

In addition to ridge atrophy, the form of a denture-supporting ridge is often compromised (fibrous or 'flabby') in the elderly patient. This is especially true of the upper anterior ridge when an upper complete denture is opposed by natural lower anterior teeth ('combination syndrome').<sup>13</sup> This, too, can make for a very challenging prosthodontic situation. In addition, as previously noted, elderly patients often have significant medical histories that can complicate complete denture provision.

As well as challenging patient factors that make complete denture provision an issue in modern UK dentistry, there are also problems related to service provision and complete denture education. If it is agreed that complete dentures, though fewer in number than a few decades ago, are more difficult to treat now, the question arises whether there are enough prosthodontic clinicians available with sufficient expertise and experience in complete denture fabrication, throughout the country, to provide this treatment. Certainly, it is no secret that the amount of complete denture education that is provided on all undergraduate programmes, in dental schools across the UK, is significantly less now than in the past. The result of this is that younger practitioners are often less equipped to deal with these clinical challenges than was the case several years ago. It is believed by some that, in the near future,

complete denture provision will be removed from the undergraduate curriculum and will be exclusively the province of postgraduate education.

#### Conclusion

The dental management of the elderly patient is becoming more of a problem. This paper has outlined some of the social, medical and oro-dental issues that are relevant in considering how one should best manage such patients. Certainly, the numbers of elderly patients in the UK who will have problematic social, access-to-care and medical situations with which to deal, will increase in the future.

Elderly patients are retaining their natural teeth more into their advancing years. The retention of natural teeth will mean that many dental conditions will require management. These conditions will include coronal and root surface caries, periodontal disease and toothwear. Although the rate of edentulism has decreased over the last 40 years, there are still significant numbers of edentulous patients requiring complete denture prosthodontic management, often with challenging denture-bearing ridge anatomy.

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