

Minimally invasive prosthodontics for older adults

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The term «older people» refers to those aged 65 or older but this group of people is not homogenous. They can be differentiated into: «young» and «old» based on their age, «healthy» or «medically compromised», based on their general health, «strong» or «frail», based on their physical condition, «advantaged» or «disadvantaged», based on their economic status, «community-based» or «in residential care» based on their residence, «independent» or «dependent» based on their self-care ability, «dentate» or «edentulous» based on the possession of any natural teeth (Whelton, Kelleher et al. 2011). Age in itself should not determine care pathways, and patients' medical and social circumstances are important determinants of oral health and outcome of treatment.

Over the past 20 years, there have been major changes in oral health profiles in Europe which reflects changing attitudes to the importance of oral health in older age. Throughout a life course, damage to teeth accumulates and consequently there is a high burden of dental disease in old age with high risk of toothloss. Complete toothloss has fallen to between 5 and 9% of the adult population in most EU countries. The current figures regarding total toothloss indicate that is largely confined to the elderly and has a prevalence ranging from 14% in Lithuania to 53% in Bulgaria for those over 65 years of age (ref: Petersson and Yamamoto, 2005). This underlying trend in toothloss prevalence reflects the varying levels of sophistication in oral healthcare delivery in various countries, socio-economic status and differing patient attitudes to and awareness of the importance of oral health. As a consequence of increased tooth retention rates, the prevalence of dental

disease has also increased in most countries. Dental decay (caries) continues to be a major public health problem and affects all adults to varying degrees, resulting in pain, loss of chewing function and poor aesthetics. Severe periodontitis disproportionately affects older adults, and left untreated, causes bad breath, pain and toothloss. These adverse affects are complicated by medical and social circumstances of older patients, particularly the onset of oral dryness («xerostomia») which is common in old age. Oral dryness reduces the host response to bacteria that cause oral diseases, and thus increase the risk of oral disease and toothloss. Additional factors, such as anxiety related to attending oral healthcare professionals among older adults due to unpleasant experiences earlier in life, impact on the provision of oral healthcare in the elderly.

By old age, the effects of oral disease become increasingly difficult and costly to manage, with toothloss affecting nutrition, quality of life and general health. Oral function and ability to chew diminishes as natural teeth are lost, and it can also have negative impact on appearance and self-esteem.

Given the rapidly changing age profile of the European population, and their complex health needs, there is a need to develop new evidence-based approaches to healthcare, including oral healthcare, which are cost effective.

Management of toothloss

Toothloss is conventionally addressed in partially dentate older patients by replacing missing teeth with removable partial dentures (RPDs). RPDs can be hard to maintain and make oral hygiene procedures more complicated for patients. Implant retained prostheses are an alternative to RPDs. This approach is effective but beyond the financial resources of many older adults. It is not yet known implant retained prostheses would be more acceptable to patients if the cost of treatment were subsidised by healthcare insurance companies. Fear of surgery among older adults may also be a barrier to this treatment approach, but this has not yet established for partially dentate older patients. It is certainly a barrier to having implants in edentulous patients (Ellis et al, 2013), so its possible this also applies to partially dentate older adults.

Conventional approaches emphasize replacement of all lost teeth. However, oral functional needs change with age, and replacement of all lost teeth may not be required to deliver improved health outcomes in older patients. Recently, treatment philosophies have been developed that take a functionally oriented approach to oral healthcare with a focus on providing a reduced, but healthy, natural dentition which can be maintained with support of better oral hygiene. From a public health viewpoint, functionally oriented dentistry (FOD) may be attractive if it can be shown to provide an acceptable level of oral function in a more cost-effective manner than conventional alternatives.

Risk Assessment

The risks of unplanned tooth loss in elderly patients, particularly frail elderly, are high given the cumulative nature of the effects of oral disease and its treatment, and, the impact of co-morbid medical conditions on oral health. When planning complex restorations for missing teeth in young elderly patients (e.g., those between 65 and 75 years of age), it is important to consider if the patient has the capacity to maintain these restorations. It should be borne in mind that as patients become older and frailer, their ability to maintain a high standard of oral hygiene will diminish. This will compromise abutment teeth for removable partial dentures, conventional fixed bridge-work and implant retained restorations in the medium to long term. If in doubt, the treatment should be simplified and made easier to maintain as will be discussed later. Secondly, unplanned and uncontrolled progression of toothloss in elderly patients is highly undesirable. If a patient becomes edentate late in the life course without adequate preparation, the chances of successful adaptation to complete replacement dentures are low. In this scenario, the patient is likely to have a seriously compromised quality of life and compromised oral function. It is important that the clinician establishes a prognosis for the dentition and if it is considered poor, then counsels the patient accordingly. Many patients will have resisted toothloss and wearing dentures over the life course and may continue to be resistant to this advice. However, whilst respecting the patient's right to ignore this advice, it is

important to make the patient fully aware of the potential consequences of unplanned toothloss.

Decision making for elderly who are partially dentate needs to consider a range of issues which impact the prognosis for the remaining dentition. These include:

- 1) Behaviours and attitudes to oral healthcare. Smoking has a direct impact on disease, particularly mucosal and periodontal disease. If the patient is unwilling to modify this behaviour, than this should influence the decision whether or not to offer restorative treatment. If oral hygiene is poor, then this may reflect a poor attitude to oral health, or, inability to comprehend or implement appropriate oral hygiene procedures. In the case of the former, then a controlled progression to edentulousness should be considered. Conversely, if the issue is ability to understand or implement, then tailored supportive periodontal care should be offered with a view to maintaining a functional, natural dentition.
- 2) Medical considerations: There are a range of co-morbidities which directly impact the prognosis for teeth, and, the consequences of surgical procedures in the mouth. A number of commonly prescribed medications cause oral dryness (xerostomia), and this compromises dental and periodontal health. In such cases, the oral healthcare professional should consult with the patient's medical practitioner to see if alternatives can be found for medications causing oral dryness. A more recent issue has been the impact of bisphosphonate medications on wound healing. These medications are commonly prescribed in the management of osteoporosis and a variety of cancer treatment regimes in older patients. If a patient has had a prolonged course of oral bisphosphonates (i.e., >3years), or had bisphosphonate medication administered IV, then there is a risk of osteonecrosis following surgical procedures including dental extractions and placement of dental implants. Risk assessment is topical at the present time, and a number of options are available to help determine risk of future disease. Chairside testing kits have been developed which test for markers indicative of caries, for example, CRT (Ivoclar Vivadent™) and GC Saliva Check Buffer™.

Minimally invasive strategies

In the case of partially dentate adults, replacement of missing teeth incurs a biological price. This may be justified if the procedure

for replacing missing teeth confers a substantial functional and cosmetic benefit to the patient. Conventional treatment in partially dentate older adults generally involves restoration of missing teeth with removable partial dentures (RPDs). This form of treatment is considered if toothloss has reduced the patient's ability to chew, or, has led them to be dissatisfied with the appearance of their dentition. This may occur when a key tooth (e.g., an upper front tooth) has been lost, or, when an existing RPD has become unsatisfactory. RPDs can be used to replace large numbers of missing teeth, and are designed to improve masticatory function, speech, oral comfort and restore appearance when anterior teeth are missing. This approach is costly, as it involves multiple visits to a dental clinic (usually a minimum of 5 visits for the denture provision alone), laboratory costs for the manufacture of the denture, and it also involves a high burden of maintenance after fitting. Maintenance requirements include the repair of potential damage to teeth next to the denture (abutment teeth), mechanical failure of components of the denture, and loss of fit of the denture to the underlying tissues over time. There is a risk of damage to teeth next to the spaces replaced by partial dentures, and this risk increases depending on the amount of teeth covered by the denture and the patient's ability to control plaque. Survival rates of teeth in the vicinity of partial dentures have been reported to be as low as 40% after five years (Vermeulen et al, 1996). It is also known that RPDs that only replace missing lower posterior teeth are often not worn, or worn sporadically, by patients. The reason for this is not fully understood. Dental implants can also be used to retain prostheses in the mouth. However, implants are invasive and very expensive to provide, complicate oral hygiene procedures and have associated maintenance costs, including replacement of damaged components. Whilst maintenance of implants is less frequent than RPDs, replacement costs of implant components are high. Implant failure is also known to be higher when patients also have active periodontal disease, and they make oral hygiene procedures more difficult for patients.

A key question in deciding a restorative approach for partially dentate patients is whether they actually need to have all missing teeth replaced. It has been documented in clinical studies and population surveys that a sub-optimal, but acceptable, level of oral function can be achieved by retaining 20 natural teeth (Witter et al, 2001). The so called «shortened dental arch (SDA) concept employs a functionally oriented approach to restorative dentistry. In contrast to conventional treatment, FOD aims for a reduced,

but healthy and functional dentition without the use of a removable prosthesis or implants. Teeth are only replaced if they are considered important by the patient to appearance or function. Clinical experience indicates that patients will seek treatment to replace visible missing teeth at the front of the mouth for aesthetic reasons, or other teeth to improve chewing function following the recent loss of a key tooth or teeth. A key guiding principle in FOD is to have a minimally invasive approach to disease management and restoration of missing teeth, and to minimise the burden of maintenance for patients and dental health professionals. In so doing, there is the potential to provide positive oral health outcomes at a lower cost. By avoiding use of RPDs and thereby reducing the long-term associated costs, the approach also offers the potential for a more cost-effective treatment strategy. The aim of treatment is to provide a functional (albeit reduced) dentition, and this is generally achieved by providing 3-5 contacting pairs of posterior teeth with an intact and aesthetically acceptable anterior dentition. Where appropriate, this is achieved using minimally invasive adhesive fixed bridgework to replace anterior missing teeth or extend the number of posterior tooth contacts. The use of resin bonded bridgework to restore interrupted dental arches, and, extend shortened dental arches is shown in Fig. 1. A number of randomised clinical trials have demonstrated the acceptability of this approach to patients, its economic impact, and critically, that there is substantially lower



Fig. 1: Cast metal resin bonded bridge used to extend a shortened dental arch



Fig. 2: Fibre reinforced composite resin bridge replacing a missing tooth in an interrupted shortened dental arch

Schwerpunktthema • 24. Jahrestagung

disease incidence in patients managed in this way compared to those provided with RPDs (Jepson et al, 2001).

It is also possible to use fibre reinforced composite resin bridgework (Fig.2) instead of cast metal adhesively retained bridgework to replace a single missing tooth in a shortened dental arch. This is not as strong, and has a higher likelihood of fracture. However, it has the advantage of being less expensive to provide and is a non preparation technique. These bridges can be laboratory made, or, made chairside using either a composite resin tooth, or immediately replace an extracted natural tooth having removed its root (Fig.

2). It may be useful where occlusal loading is limited (e.g., when opposed by a complete or partial denture) and fracture is less likely.

Conclusion

Treatment of the partially dentate older adult is an increasing requirement in clinical practice. The choices for treatment should recognise the perceived need of the patient, and their ability to maintain an adequate standard of oral hygiene. Minimally invasive approaches to tooth replacement appear to satisfy patient needs and reduce maintenance requirements.



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Challenges of Gerodontology for the General Practitioner

Michael MacEntee, University of British Columbia.



Michael MacEntee

The challenge of dental geriatrics for any clinician begins with personal sensitivities about death and dying. Resolving personal concerns about frailty and death, and knowing how one wants to die is the first step in preparing to help others who are challenged intimately by the disabilities of old age and proximity of death. There are many clinical services represented on the care teams assigned to elderly people, but, as yet, representatives from the dental professions are not widely acknowledged by other professions as essential to good care. Therefore, reaching out to medical and nursing colleagues is the second challenge for most dental and dental hygiene practitioners who wish to continue serving their aging patients. Unfortunately, the extent of this challenge is exacerbated by rapidly changing global demographics. The size of our aging population is increasing dramatically but without an equivalent growth in the supporting workforce of taxpayers needed to sustain the health and social services expected by the multicultural societies of most countries today. Concerns have been raised about the consequences of this challenge to our future financial and social security along with suggestions that we seek simple and relatively inexpensive solutions to the dental needs of everyone including older people. The World Health Organization supports the view that chronic disease – including caries – constitutes the biggest challenge to healthcare systems everywhere.

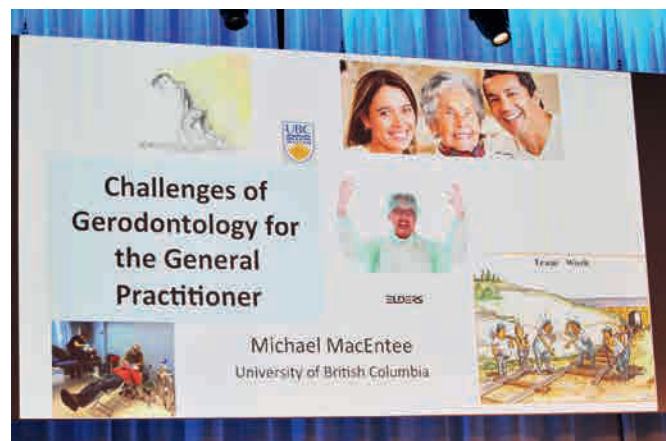
Dentistry can address the consequences of oral impairment and disability to slow the inevitable physical and cognitive decline of frailty. However, it is disturbing to see that most technologically advanced communities are essentially inattentive to the quality of care in long-term care facilities, and that still

there are residents who do not even have a simple toothbrushes or easy access to other basic oral healthcare supplies. It is no surprise, therefore, that the challenge of aspiration pneumonia, which is the leading cause of death in old age, flourishes despite the known benefits of oral hygiene as a practical and inexpensive way to reduce the risk of pneumonia in hospitals and nursing facilities.

It is in the context of this widespread neglect and apparent lack of concern for oral healthcare that the general practitioner must view the challenges of gerodontology. It is also in a social and therapeutic context where sugar consumption is encouraged by aggressive marketing, and, as a consequence, frail elder caries (FEC) poses a serious threat to life and well-being. This particular challenge of FEC increases further when physicians prescribe medications that disturb saliva but fail to in-

form patients about the essential homeostatic role of saliva in oral and general health.

Dentists also exacerbate the challenge of gerodontology by providing technologically complicated treatments, such as prostheses with multiple implants, without acknowledging and addressing the additional difficulty that implant-prostheses impose on oral hygiene along with the increased risk of aspiration pneumonia. Finally, on a personal and a professional level, the most persistent and unacknowledged challenge to all clinical practitioners comes from the uncertainty of our treatments, and from a need for simplicity and sustainability in all of the care we provide. Only then can we address adequately the grand challenge of helping to maintain the dignity and serenity of our patients as they cope with their frailty and decline.



Zähne im Alter: wichtiger denn je zuvor!

Martin Schimmel



Martin Schimmel

Das Schweizerische Gesundheitsobservatorium (Obsan) prognostiziert, dass in der Schweiz zwischen 2008 und 2030 die Zahl der über 65-jährigen Einwohner von 1'280'000 auf 2'115'000 ansteigen wird. Die Zahl pflegedürftiger Menschen könnte im gleichen Zeitraum um 50% auf bis zu 230'000 ansteigen [1]. Die Schweizerische Zahnärzteschaft stellt sich auf die damit verbundenen Herausforderungen ein.

Eine vernachlässigte Mundhygiene kann durch Karies und Zahnfleischerkrankungen zu Schmerzen, Infektionen, Abszessen und Zahnverlust führen. Dies schränkt die Lebensqualität und auch die Fähigkeit zu kauen erheblich ein. Die gemeinsame Mahlzeit im Freundes- oder Bekanntenkreis ist ein sehr wichtiger sozialer Fixpunkt im Leben älterer und pflegebedürftiger Menschen; insuffiziente Prothesen oder Schmerzen im Mund beeinträchtigen diese soziale Interaktion erheblich. Das Selbstwertgefühl verringert sich, wenn mangelhafte Prothesen oder Frontzahnverluste vorhanden sind. Auch kann durch Schwierigkeiten beim Kauen eine Protein-Energie-Mangelernährung begünstigt werden.

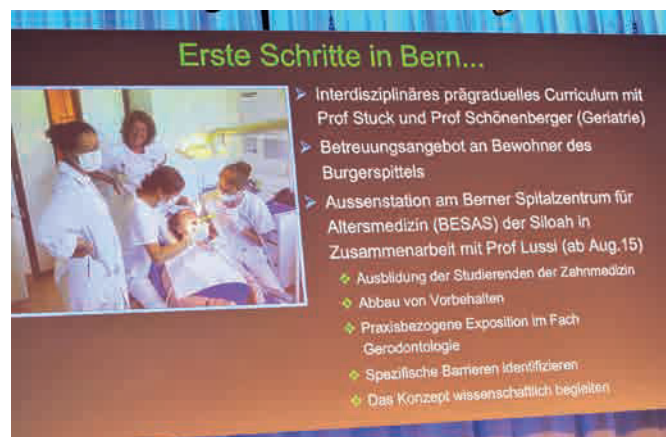
Darüberhinaus haben Studien gezeigt, dass Infektionen im Mund negative Auswirkungen auf den ganzen Organismus haben können. Bei Menschen mit Schluckstörungen, eine vielfach anzutreffende Erkrankung im Alter, werden häufig orale Keime in Bronchien und Lunge verschleppt [2]. Dies kann zu lebensbedrohlichen Lungenentzündungen (Aspirationspneumonien) führen. Patienten mit Zahnfleischerkrankungen sind häufiger von Schlaganfällen und Herz-Kreislaufkrankungen betroffen als Menschen mit einer intakten Mundgesundheit; auch ein Zusammenhang mit einigen Diabetestypen ist statistisch belegt [3]. Eine Zahnfleischbehandlung kann sogar die Kontrolle des Blut-

zuckerspiegels günstig beeinflussen [4]. Diese zahnärztliche Betreuung älterer Menschen sollte vor allem einen vorbeugenden Charakter haben, um Infektionen zu vermeiden und Schmerzen zu verhindern. Eine adäquate Mund- und Prothesenhygiene ist dabei besonders entscheidend. Dies gilt vor allem für Menschen, die an Demenz erkrankt sind und bei der Mundhygiene auf Hilfe angewiesen sind. In der Palliativbetreuung sollte ebenfalls eine zahnärztliche Betreuung als Teil des Pflegekonzeptes integriert sein [5].

An den Zahnmedizinischen Kliniken der Universität Bern zmk bern findet das Thema Gerodontologie starke Beachtung. Nach Einrichtung eines eigenen Lehrstuhls im Jahr 2014 wird die Ausbildung der Studierenden hierin intensiviert. Kooperationen mit der Geriatrie des Inselspitals unter Leitung von Prof. Andres Stuck sollen helfen, Studierenden und Zahnärzten auch allgemeinmedizinische Aspekte zu vermitteln. Konkrete Pläne zur praktischen Ausbildung sowie zur verbes-

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serten Patientenversorgung sind weit fortgeschritten. So soll im August 2015 in Zusammenarbeit mit der Klinik für Zahnerhaltung der zmk bern (Leiter Prof. Adrian Lussi) eine Aussenstation am Berner Spitalzentrum für Altersmedizin (BESAS) der Siloah in der Gemeinde Muri/Gümligen eröffnet werden. Eine enge Zusammenarbeit mit dem Bürgerpittel im Viererfeld (Bern) soll auch dort die zahnmedizinische Betreuung der Bewohner sicherstellen.

Alles im Einklang mit den Leitlinien und Standards der SSO.