Tooth loss and quality of life in the elderly

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Introduction

• Tooth loss continues to be a major problem in clinical dentistry.
• It has received significant attention in everyday dental practice.
• Tooth loss used to be considered an inevitable consequence of old age.
Introduction

• Innovation in modern medicine has led to increase in life expectancy in most parts of the world.

• Population of the elderly.

• Presently 600 million aged 60 and over. Number will double by 2025 and 2 billion in 2050.

• Hence demand for dental care is expected to upsurge in the elderly.
Causes of missing teeth


Causes of Tooth loss

A few conclusions from these articles

- Many of these studies were hospital based.
- There is disagreement on the commonest cause of tooth loss.
- Some authors concluded that dental caries is the commonest while others found periodontal diseases.
- But there is agreement that dental caries and periodontal diseases are the two major causes of tooth loss.
Risk factors for tooth loss


Risk factors for tooth loss

Conclusion from the articles.

- Poor education/low educational status.
- The socio-economic status of the patient.
- Tobacco.
Prevalence of edentulousness (%) of elderly reported for selected countries throughout the world (Source: WHO Global Oral Health Data Bank and WHO Oral Health Country/Area Profile Programme 2000)

<table>
<thead>
<tr>
<th>WHO Country/Region</th>
<th>Pct (%) edentulous</th>
<th>Age group (yrs)</th>
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<tbody>
<tr>
<td><strong>Africa</strong></td>
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<tr>
<td>Gambia</td>
<td>6</td>
<td>65+</td>
</tr>
<tr>
<td>Madagascar</td>
<td>25</td>
<td>65-74</td>
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<tr>
<td><strong>The Americas</strong></td>
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<tr>
<td>Canada</td>
<td>58</td>
<td>65+</td>
</tr>
<tr>
<td>USA</td>
<td>26</td>
<td>65-69</td>
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<tr>
<td><strong>East Mediterranean</strong></td>
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<tr>
<td>Egypt</td>
<td>7</td>
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<tr>
<td>Lebanon</td>
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<td>Saudi Arabia</td>
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<td><strong>Europe</strong></td>
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<td>Austria</td>
<td>15</td>
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<td>Denmark</td>
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<td><strong>South-East Asia</strong></td>
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<td>India</td>
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<td>Indonesia</td>
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<td>Cambodia</td>
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<td>China</td>
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<tr>
<td>Malaysia</td>
<td>57</td>
<td>65+</td>
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</tbody>
</table>
Prevalence of edentulism

• There is a lack of epidemiological studies on edentulism in many countries in Africa.
• However some reported earlier onset of edentulism in developing countries.
• Since tooth loss is prevalent in this age group, it is important to know its impact on the quality of life.
## Measures of impact

<table>
<thead>
<tr>
<th>Authors</th>
<th>Name of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cushing et al. 1986</td>
<td>Social Impacts of Dental Disease</td>
</tr>
<tr>
<td>Atchinson and Dolan, 1990</td>
<td>Geriatric Oral Health Assessment Index</td>
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<tr>
<td>Strauss and Hunt, 1993</td>
<td>Dental Impact Profile</td>
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<tr>
<td>Slade and Spencer, 1994</td>
<td>Oral Health Impact Profile</td>
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<tr>
<td>Locker and Miller, 1994</td>
<td>Subjective Oral Health Status Indicators</td>
</tr>
<tr>
<td>Leao and Sheiham, 1996</td>
<td>Dental Impact on Daily Living</td>
</tr>
<tr>
<td>Adulyanon and Sheiham, 1997</td>
<td>Oral Impact on Daily Performances</td>
</tr>
<tr>
<td>McGrath and Bedi, 2000</td>
<td>OH-QoL UK</td>
</tr>
</tbody>
</table>
Measures of impact

• It is important to know to what extent tooth loss affect OHRQoL before using OHRQoL measures to evaluate treatment outcomes.

• This enables development of clinical decision making to provide appropriate oral health care.
Impact of tooth loss on oral health

• Tooth loss will presumably cause functional impairment for example with regards to
  -Chewing/ Nutrition
  -Communication
  -Aesthetics/social interactions
Impact of tooth loss on chewing/nutrition

- Tooth loss, chewing ability and quality of life.
Conclusions:

• Chewing ability was related to OHRQoL and general health,

• Possibly reflecting the impact of chewing on food choice and enjoyment of meals and diet.

• Also indicated the importance of oral health to general well-being.
Summary of articles regarding the relationship between edentulism and nutrient intake

- Sheiham et al 2001 significantly lower intake of numerous nutrients.
- Krall et al 1998 decreases intake of protein, calories, Vit, fibre..
- Fontijn-Tekamp et al 1996 Significantly lower intake of calories, minerals, Vit, fibre.
- Papas et al 1998 Significantly lower intake of Vit, minerals, proteins and calories
- Mjon et al 1999 lower serum albumin and lower BMI
- In conclusion (review): Huton, Feine and Morais 2002: Good evidence that edentulism is associated with poor diet and compromised nutrition’ J.can.dent Assoc 68(3): 182-7
Impact of tooth loss on communication

• Literature on Tooth loss and speech is sparse.
• Stelzle F, Ugrinovic B, Knipfer C, Bocklet T, Nöth E, Schuster M, Eitner S, Seiss M, Nkenke E.

Automatic, computer-based speech assessment on edentulous patients with and without complete dentures - preliminary results.

Conclusion:

• Word accuracy was significantly reduced in edentulous speakers compared to the control group.

• Speech production quality was significantly reduced after complete loss of teeth.
Impact of tooth loss on communication

- Knipfer C, Bocklet T, Noeth E, Schuster M, Sokol B, Eitner S, Nkenke E, Stelzle F.

Speech intelligibility enhancement through maxillary dental rehabilitation with telescopic prostheses and complete dentures: a prospective study using automatic, computer-based speech analysis.

Conclusion:

• Patients benefit from the fabrication of new dentures in terms of speech intelligibility, regardless of the type of prosthesis.
Impact of tooth loss on aesthetics

Conclusion:

• All the studies reported higher impact for missing anterior teeth than missing posterior teeth.

Impact of tooth loss on general health

• The relationship between oral and general health has long been controversial
• The results have been far from conclusive
• Therefore positive associations should be interpreted with caution.
The Impact of Tooth Loss on General Health Related to Quality of Life Among Elderly Pomeranians: Results from the Study of Health in Pomerania (SHIP-0)

Florian Mack, Dr Med Dent\(^a\)/Christian Schwahn, Dr Rer Nat\(^b\)/Jocelyne S. Feine, DDS, HDR\(^c\)/Torsten Mundt, Dr Med Dent\(^a\)/Olaf Bernhardt, PD, Dr Med Dent\(^d\)/Ulrich John, Prof Dr Phil\(^e\)/Thomas Kocher, Prof Dr Med Dent\(^f\)/Reiner Biffar, Prof Dr Med Dent\(^g\)

**Purpose:** It is important to know whether tooth loss has an impact on an individual’s quality of life, since tooth loss is common. The aim of this study was to determine whether oral status is associated with general health and related to quality of life.

**Materials and Methods:** Data of 1,406 subjects aged 60 to 79 years were taken from the Study of Health in Pomerania (SHIP). Sociodemographic (age, sex, and education level) and medical information (including the most common diseases in Germany) were gathered through an interview, and income data were obtained from a self-administered questionnaire. The prosthetic status in the maxilla and mandible was classified into complete denture or removable partial denture or with $\geq 10$ natural teeth including teeth replaced with fixed prosthodontics ($\geq 10T$) or with $< 9$ natural teeth.
Conclusion:

• Reduced dentition without replacement of missing teeth by removable or fixed prosthodontics reduces the physical index of quality of life to the same extent as cancer or renal diseases.
Impact of tooth loss on general health

• Osterberg et al, Community Dent Oral Epidermiol 1990;18:313-8
• Appollonio et al J.Am Geriatr Soc 1997;45:1315-23
• Morita et al, Gerondontology 2006;23:214-8
• Cabrera et al sweden Eur J Epidemiol 2005;20:229-36
Conclusion:

• The results were not always consistent with respect to gender (though most reported significant difference among men but not in women)

• Age

• Localities of the sample

• and influence of common risk factors for death such as tobacco etc.
Number of teeth—a predictor of mortality in 70-year-old subjects.

Osterberg T, Carlsson GE, Sundh V, Mellström D.

Department of Geriatric Medicine, Sahlgrenska Academy at Göteborg University, Göteborg, Sweden. g.carlsson@odontologi.gu.se

Abstract

OBJECTIVES: To investigate whether the number of teeth at age 70 is an independent predictor of mortality.

METHODS: Within the gerontological population studies in Göteborg, Sweden, four birth cohorts born in 1901/1902, 1906/1907, 1911/1912 and 1922 were examined cross-sectionally at 70 years of age. The total number of participants in the odontological cohorts was 1803. Mortality data were collected from the national Swedish health registers. Cox regression models were used to measure the association between mortality and the number of teeth with adjustment for covariates such as health factors, socio-economic and lifestyle factors.

RESULTS: The prevalence of edentulism showed a marked change from 51% in the first cohort to 16% in the last cohort. The 7-year mortality rate was 14% in women and 28% in men, and the highest in edentulous men in the last two cohorts (42% and 47% respectively). The 7-year mortality including all four cohorts showed a hazard ratio of 0.96 (95% CI 0.94-0.98; P < 0.001) for the number of teeth with adjustment for cohort. The corresponding 18-year mortality including the three first cohorts showed a hazard ratio of 0.98 for women and 0.97 for men. The number of teeth was an independent statistically significant predictor of 7-year mortality in both genders and of 18-year mortality in men.
Conclusion:

• They reported a significant association between number of teeth and mortality independent of other common risk factors.

• The mortality risk over 7 years was almost three times greater for edentulous people compared with those with $\geq 20$ teeth in both genders.
Impact of tooth loss on general health

• Polzer I, Schwahn C, Völzke H, Mundt T, Biffar R.

The association of tooth loss with all-cause and circulatory mortality. Is there a benefit of replaced teeth? A systematic review and meta-analysis.

Conclusion:

• An effect of denture use on circulatory mortality remains to be established, as well as whether the number of replaced teeth affects mortality.

• Specifying the role of potential pathways by which tooth loss-related mortality is mediated will possibly increase the value of dental treatment for general health.
Impact of tooth loss on life satisfaction

- David S. Brennan A. John Spencer Kaye F. Roberts-Thomson

Tooth loss, chewing ability and quality of life
Conclusion:

- The relationship with life satisfaction indicated the importance of oral health to general well-being.
Impact of tooth loss on life satisfaction


Conclusions:

• The significant number of patients that failed to come to terms with their tooth loss indicates that the effect of tooth loss on self-esteem and self-image is not short lived as it has been assumed.

• The impact that tooth loss can have on people and their lives should not be underestimated. In this study it affected 45% of the participants.
Treatment options and quality of life

• Various studies have shown that tooth loss impact on the OHRQoL of the elderly.
• Thus the various treatment modalities for replacing missing teeth should aim at improving the QoL and should be cost effective.
Management of missing teeth

Treatment Options

Missing teeth?

- Restore it
  - Fixed prosthesis
  - Removable prosthesis
  - Acrylic partial dentures
  - Cobalt Chrome partial dentures
- Leave it
  - When?
  - Implants

Tooth Regeneration!!!
Functions of Removable Appliance

A removable denture improves:

• Aesthetics
• Mandibular stability
• Mastication
• Speech
• Self esteem.

• And prevent untoward sequela of tooth loss.

Creugers NH, de Baat C
[Removable partial dentures. Oral functions and types]
Problems Associated with Removable Dentures

- Support
- Stability
- Retention
- Other problems
  - Comfort
  - Chewing function
  - Aesthetics
  - Poor oral hygiene
  - Injury (teeth, mucosa)
  - Ulceration, granuloma etc.

QUALITY OF LIFE
Retention


• The problems of retention have been associated with complete dentures for grossly resorbed mandibular ridge.

• Also clasp arms tend to lose retention during long-term function. Although rigid components and guide planes may compensate for this.
Comfort


Conclusion:

The oral comfort of subjects with SDA in this study is compromised to a small extent but remains acceptable to the patients. **Free-end RPDs do not appear to help oral comfort in these cases.**
Chewing function


• **Conclusion:** A higher percentage of patients with implant-supported overdentures reported improvements in chewing comfort and moderate-to-complete overall satisfaction compared to those with conventional dentures.
Chewing function


Conclusions: Objective benefits in masticatory performance of implant-supported or retained dentures compared to conventional dentures are limited to a mandibular IOD in edentulous patients with a resorbed mandible and/or difficulty adapting to CDs.
Periodontal problems


• **Conclusion:** Metallic partial dentures appear to cause increased plaque accumulation and gingival inflammation around abutment teeth than the control teeth although this was found not to be statistically significant.
Quality of Life


Quality of life

Conclusions from the studies

• Subjects who received implant-retained prostheses reported a significant improvement in satisfaction and OHRQoL, as did subjects who requested and received conventional dentures.

• Subjects who requested implants, but received conventional dentures, reported little improvement in denture satisfaction and only modest improvement in their quality of life.
• Mandibular implant-retained overdentures may be more satisfying than new conventional dentures, the magnitude of the effect is still uncertain.

• To date, research in the field of patient-based outcomes has concentrated on dental implant treatment and few on RPD.

• There is a need for additional evidence
Summary


Summary

- On one hand, prosthodontic reconstructions compensate for the sequelae of negative changes in the oral cavity on the other hand, they often enhance or accelerate them.
- Problems of partial dentures are mainly related to Free end saddles and mandibular complete denture.
- A set of reliable criteria is necessary for decision-making and problem management.
- It appears that the majority of published data on RPDs does not depict high effectiveness of this treatment modality.
- From a strict point of view of evidence-based dentistry, the level of evidence is low if not missing for RPDs.
Fixed Prosthesis

• Petricevic N, Celebic A, Rener-Sitar K.
  A 3-year longitudinal study of quality-of-life outcomes of elderly patients with implant- and tooth-supported fixed partial dentures in posterior dental regions.
Conclusion:

• The FPD and the IFPD treatment showed significant improvement of OHRQoL. The FPD treatment improved OHRQoL equally in both age groups, while the IFPD treatment improved OHRQoL better in older patients.
Fixed Prosthesis

John MT, Slade GD, Szentpétery A, Setz JM.

• Oral health-related quality of life in patients treated with fixed, removable, and complete dentures 1 month and 6 to 12 months after treatment.

Conclusion:

- OHRQoL changed substantially comparing pretreatment scores with 1 and 6 to 12 months of follow-up in patients treated with fixed, removable, and complete dentures.
Implant prosthesis

• Allen PF, McMillan AS.
  A longitudinal study of quality of life outcomes in older adults requesting implant prostheses and complete removable dentures.
Conclusion:

• Subjects with implant-retained prostheses reported a significant improvement in satisfaction and HRQoL, as did subjects who requested and received conventional dentures.

• None of the denture-wearing subjects reported health-related quality of life that was as good as that of dentate subjects.
Implant prosthesis

Conclusion:

• Implant-supported dentures including either complete overdentures or a hybrid prosthesis significantly improve the quality of life for edentulous patients compared with conventional removable complete dentures.
Implant Prosthesis

• Emami E, Heydecke G, Rompré PH, de Grandmont P, Feine JS.

Impact of implant support for mandibular dentures on satisfaction, oral and general health-related quality of life: a meta-analysis of randomized-controlled trials.

Conclusion:

• Though mandibular implant retained overdentures may be more satisfying for edentulous patients than conventional dentures, the magnitude of the effect is still uncertain.

• There is a need for additional evidence including cost-effectiveness analyses on the impact of mandibular implant overdentures and conventional dentures.
The picture of the elderly in Nigerian setting

• Out of work
• Pensions are low and not regular
• No social support, old people’s home
• Access to health is limited
• They have diseases in old aged which they spend money on rather than their oral health which they feel is not life threatening
• No functional health insurance scheme
• Oral health is neglected by the politicians and government.
How many teeth are needed for a healthy, functional dentition?
Dental literature

Haraldson & Carlsson, 1979: ‘median of 9 pairs of occluding teeth’
Käyser, 1981: ‘discomfort begins with < 10 pairs’
Cushing & Sheiham, 1986: ‘no problems with ≥ 20 teeth’
Leake et al., 1994: ‘no need to replace if 3 or more posterior functional teeth are present’
Rosenoer & Sheiham, 1995: ‘people were satisfied even with all molars missing’

In conclusion (review): Elias & Sheiham, 1998: missing posterior teeth are not very important from a subjective aspect’
The SDA concept:

• is not a therapy
• is a treatment strategy aiming to provide satisfactory oral function when there are limitations for optimal dental care.

Criteria for application of SDA concept:
• Dental problems confined to posterior teeth.
• Good prognosis for 10 pairs of ant. and premolars.
• Limited possibilities for extensive restorative care.
• Absence of parafuntion or mand. dysfunction.
• When the biologic price of fitting a denture will be high
Possible advantages of the SDA concept include:

- simplification of holistic restorative management and subsequent maintenance
- simplification of oral hygiene maintenance.
- enhanced prognosis for the remaining teeth when the patient is motivated to maintain his own dentition.
SDA and OHRQoL

• Ikebe K, Hazeyama T, Kagawa R, Matsuda K, Maeda Y.

Subjective values of different treatments for missing molars in older Japanese.

Conclusion:

• These elderly Japanese preferred cantilever FDPs and metal RPDPs to implants and 'no replacement'.

• It suggests that the SDA as an oral health goal can be questionable from the patients' point of view, even if it is biologically correct.
SDA and OHRQoL

• Wolfart S et al.
  Effects of prosthetic treatment for shortened dental arches on oral health-related quality of life, self-reports of pain and jaw disability: results from the pilot-phase of a randomized multicentre trial
Conclusion:

• There were no significant differences between treatment groups at any time.

• Within each group, an improvement of life-quality was observed.

• No significant difference could be reported between the two therapy concepts.

• This may be due to the low sample size within the pilot study.
SDA and OHRQoL

• Gerritsen et al.
  Tooth loss and oral health-related quality of life: a systematic review and meta-analysis
  Health and Quality of Life Outcomes 2010, 8:126.
Conclusion:

The fewer the teeth that are present the higher the impact on OHRQoL with a marked deterioration once the number of remaining teeth drops below 17.
Summary

• There is fairly strong evidence that tooth loss is associated with impairment in OHRQoL.
• Implant retained prosthesis improved OHRQoL better than other treatment options.
• Given the negative consequences of tooth loss on OHRQoL, it is important that disease prevention measures are promoted when formulating health policy for older adults.
THANK YOU