

Comprehensive oral-health assessment of patients with brain injury in neuro-rehabilitation setting

Mohit Kothari^a, Rubens Spin-Neto^b, Jørgen Feldbæk Nielsen^a

^a Hammel Neurorehabilitation Centre and University Research Clinic, Aarhus University, Hammel, Denmark

^b Section of Oral Radiology, Department of Dentistry, Aarhus University, Denmark

Background

Motor, sensory, perceptual and cognitive deficit are common after brain injury

Three dimensions of oral self care: Function, education and training, and compliance

Oral health deteriorated by increased accumulation of dental plaque and colonization by respiratory pathogens

The condition most commonly associated with systemic diseases is periodontitis (Fig. 1)

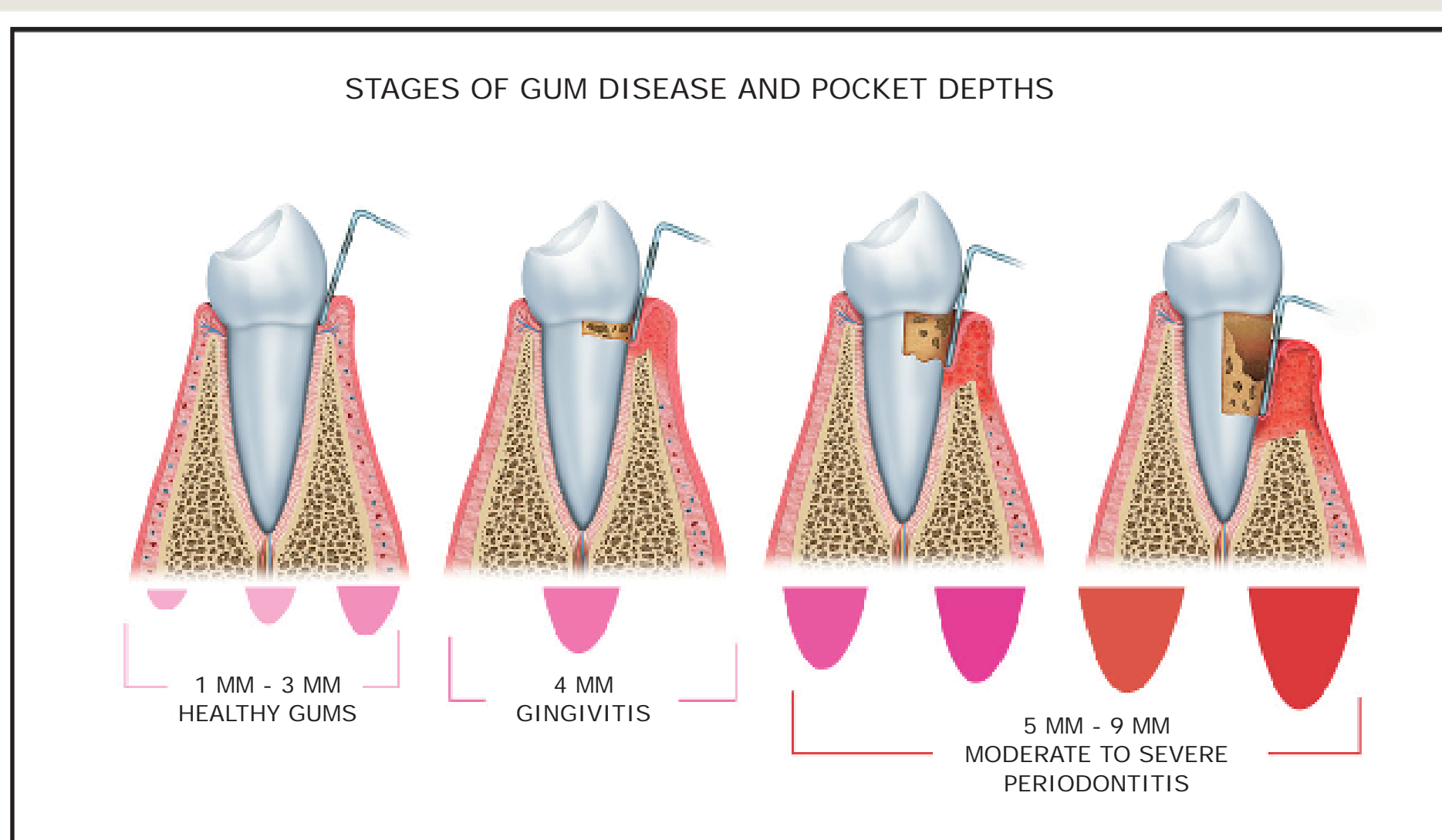


Fig. 1: Periodontitis progression

Aims

The objective of this pilot study was to perform a detailed

- 1) Clinical oral health assessment
- 2) Oral-health-related social and behavioral aspects, in acquired brain injury (ABI) patients

Materials and methods

- Thirteen ABI patients (37.5 ± 3.9 years)
- Social and behavioral history
- Bed-side oral examination score (BOE) (Fig. 2)
- Full mouth clinical examination:
 - Periodontal status (plaque, bleeding, clinical attachment levels) (Fig. 1)
 - Tooth condition (Decay, filled, missing)
- Microbiological examination
- Extent and severity of periodontal disease

Conclusions

ABI patients had a poor status across a range of oral-, dental-, and periodontal-related parameters

BOE provides a narrative and visual reference, useful tool to reinforce and sustain the assessment practice

Access to professional oral health care is not limited to "Rx per se" but also to the motivation and instructions to the patients

Structured studies are required to define evidence-based approaches for such clinical reality

Results

No significant effect of smoking or alcohol consumption on oral health

Brushing frequency and Dentist appointment related to severity and extent ($P < 0.02$)

All patients were diagnosed with chronic generalized periodontitis (CGP; $P < 0.001$) (Table 1)

Correlation between BOE and severity of periodontitis ($P < 0.01$) (Table 1)

Patient age group was significantly related to poor oral health (Table 1)

- Higher BOE score ($P = 0.01$)
- Extent and severity of periodontitis was higher ($P < 0.02$)

Table 1: Patient clinical examination

Patient	Time since injury (days)	Diagnosis	BOE score	Periodontal disease (APP, 1999)	Plaque	Periodontal disease activity	Extent (%) (Carlos et al. 1986)	Severity (mm) (Carlos et al. 1986)
1	60	traumatic brain injury	14	Mild CGP	Moderate	Inactive	61	1.8
2	262	arteriovenous malformation	17	Moderate CGP	Moderate	Active	100	2.2
3	27	aneurysm, subdural haemorrhage	13	Moderate CGP	Moderate	Inactive	73	1.4
4	65	traumatic brain injury	12	Mild CGP	Moderate	Inactive	54	1.6
5	28	aneurysm, subdural haemorrhage	19	Severe CGP	Severe	Active	96	3.8
6	07	anoxic brain injury	14	Moderate CGP	Severe	Active	94	2.3
7	32	anoxic brain injury	17	Severe CGP	Severe	Active	100	3.5
8	44	arteriovenous malformation	12	Mild CGP	Severe	Inactive	92	2.3
9	55	traumatic brain injury	12	Mild CGP	Mild	Inactive	100	1.5
10	122	arteriovenous malformation	14	Mild CGP	Severe	Inactive	73	1.3
11	80	encephalitis	15	Mild CGP	Severe	Active	91	2.7
12	44	arteriovenous malformation	14	Severe CGP	Severe	Active	100	1.9

Category	Methods of Measurement	Numerical and Descriptive Ratings		
		1 Normal	2 Moderate Dysfunction	3 Severe Dysfunction
Swallow	Observe while patient swallows, check gag reflex	Normal swallow	Pain or difficulty with swallow	Unable to swallow (intubated, absent gag)
Lips	Observe	Smooth, pink	Dry or cracked	Ulcerated or bleeding
Tongue	Observe appearance of tissue	Pink, moist, papillae present	Coated or loss of papillae with shiny appearance, with or w/o redness	Blistered, cracked, or bleeding
Saliva	Observe Use tongue blade, touching the center of tongue and floor of mouth (optional)	Watery	Thick or ropy	Absent
Mucous Membranes	Observe appearance of tissue	Pink, moist	Red or coated, no ulcers	Ulcers with or w/o bleeding
Gingiva	Observe Use tongue blade, may gently press tissue with tip of blade (optional)	Pink, firm	Edema, with or w/o redness; with or w/o bleeding	Bleeds easily
Teeth or dentures	Observe appearance of teeth or denture	Clean or no teeth	Local debris (between teeth)	General debris, decay
Odor	Smell	Normal	Slightly to moderately foul	Strong foul odor

Modified from: Eilers, et al. (1988) "Development, testing, and application of the oral assessment guide." *Oncol Nurs Forum* 15(3): 325-30.

Fig. 2. Bed side oral Examination (BOE) chart: 8-10: Excellent oral health; 11-14: Moderate impaired oral health; 15-24: Significantly impaired oral health (Used after permission)