



MICRO LABS LIMITED



SMART DENTAL UPDATES

Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you “**SMART DENTAL UPDATES**” which contains latest and interesting news in the field of Dentistry.

This issue contains

- Periodontal conditions of essential hypertension
- Color Stability of Glass Ionomer Cement after Reinforced with Two Different Nanoparticles
- The Unique Case of a Broken Periodontal Instrument Tip

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,
Medical Team, Micro Labs Limited

Periodontal conditions of essential hypertension

with periodontitis. Patients with hypertension or higher SBP were found to have significantly higher Community Periodontal Index of Treatment Needs (CPITN) scores, more gingival bleeding, and fewer remaining teeth. Periodontal infection could induce systemic vascular/endothelial dysfunction signifying a potential link between hypertension and periodontitis.

Convenience sample of 204 adults attending a university teaching hospital without (C: control) or with essential hypertension [EH; n = 102, duration (mean $\pm$ SD) 11.4 $\pm$ 6.9 years] were surveyed in this cross-sectional study. Patients with concomitant systemic conditions were excluded. Dental history, oral hygiene habits, and blood pressure were recorded. Plaque score (PI%), bleeding on probing (BOP%), probing pocket depth (PPD) and probing attachment level (PAL) were noted and periodontitis severity was determined according to AAP/CDC case definition guidelines.

Regression analysis of variables associated with periodontitis

Variables	Unadjusted				Adjusted			
	Coefficient	P-value	95% CI		Coefficient	P-value	95% CI	
(Constant)	0.149	0.841	-1.312	1.609	-0.008	0.990	-1.222	1.206
Systolic BP	0.009	0.071	-0.001	0.019	0.008	0.028	0.001	0.014
Diastolic BP	-0.003	0.748	-0.020	0.014				
Age	0.011	0.089	-0.002	0.024	0.015	0.013	0.003	0.027
Sex	0.052	0.689	-0.205	0.309				
Smoking	0.364	0.041	0.014	0.715	0.378	0.026	0.046	0.710
User of floss/interdental brush	-0.054	0.522	-0.220	0.112				
Last dental visit	0.036	0.621	-0.107	0.178				
PI%	-0.009	0.010	-0.016	-0.002	-0.009	0.011	-0.016	-0.002
BOP%	0.016	0.000	0.009	0.023	0.016	0.000	0.009	0.023
Missing teeth	0.018	0.346	-0.020	0.056				

r^2 (0.207) was computed using stepwise linear regression with variables that were significant ($P < 0.05$).

[†] Refer to Table S2 for details; no or mild periodontitis categories were collapsed into one group.

Both groups exhibited poor oral hygiene. EH group had higher mean full-mouth PAL/PPD (3.16/2.73 vs 2.51/2.40, $P < 0.001$). 51.0%/30.4% of the EH/C participants had severe periodontitis ($P < 0.001$). Regression analysis indicated systolic blood pressure, age, smoking and BOP% were associated with more severe periodontitis ($r^2 = 0.207$, $P < 0.05$) while BOP%, PAL and fewer missing teeth were associated with worse mean PPD ($r^2 = 0.612$, $P < 0.05$).

Within the limitations of this study, majority of the hospital attendees surveyed exhibited poor plaque control, while periodontitis severity was found to be associated with EH, and smoking.

Source: Chiu J et al. Aust Dent J . 2020 Jun 7. doi: 10.1111/adj.12784.

Color Stability of Glass Ionomer Cement after Reinforced with Two Different Nanoparticles

Glass ionomer cements were first developed by Wilson and Kent in the 1960s. Their high fluoride release and chemical bonding to the tooth structure make them the cement of choice for several restorative and luting functions. However, their high solubility and relatively low compressive strength have meant that since the 1980s, researchers have sought to improve the strength of glass ionomers. The present study aimed to compare the staining characteristics of a commercially available restorative glass ionomer cement to those of customized powders prepared by adding carbon nanotubes to glass ionomer cement powder or silver nanoparticles

Twenty samples each of a control glass ionomer cement (PULPDENT® Glass Fill®, Pulpdent Corp. Watertown, MA, USA), control cement reinforced with 0.0006gm (0.03% by weight) of carbon nanotubes (Sigma Aldrich, St Louis MO, USA), and control cement reinforced with 0.2gm (10% by weight) of silver nanoparticles (Nanocyl™, Nanocyl SA,

Sambreville, Belgium) were immersed in a staining solution. Color evaluations were carried out after 1 h, 24 h, and 1 week. Color change values were calculated.

The results indicated that carbon nanotube reinforced specimens exhibited less color stability when compared to controlled glass ionomer cement specimens; however, both samples had significantly greater color stability than silver nanoparticle reinforced glass ionomer samples.

TABLE 1: Overall color change patterns (ΔE) for the different groups.

		N	Mean ΔE	Std. deviation	Std. error	95% confidence interval for mean		F*	Sig.
						Lower bound	Upper bound		
<0.001 hour	Control	15	1.3460	0.66854	0.17262	0.9758	1.7162	22.434	<0.001**
	Silver nanoparticle reinforced	15	22.1340	3.30876	0.85432	20.3017	23.9663		
	Carbon nanotube reinforced	15	5.8660	1.99908	0.51616	4.7589	6.9731		
24 hours	Control	15	2.7567	1.22313	0.31581	2.0793	3.4340	19.491	<0.001**
	Silver nanoparticle reinforced	15	18.4353	3.63610	0.93884	16.4217	20.4489		
	Carbon nanotube reinforced	15	4.1033	0.92527	0.23890	3.5909	4.6157		
7 days	Control	15	3.3753	1.09621	0.28304	2.7683	3.9824	18.677	<0.001**
	Silver nanoparticle reinforced	15	23.9000	4.31245	1.11347	21.5118	26.2882		
	Carbon nanotube reinforced	15	9.7593	5.92823	1.53066	6.4764	13.0423		

*Calculated using one-way ANOVA. **Differences significant at $p < 0.05$.

Based on the methodology employed and the results obtained, it may be concluded that:
(i) The addition of reinforcing materials significantly reduces the color stability of glass ionomer cement. (ii) The addition of silver nanoparticles creates significantly lower color stability than the addition of carbon nanotubes.

Source: Pani SC et al. Intl J Dentistry. 2020, 7808535; 1-5. <https://doi.org/10.1155/2020/7808535>

The Unique Case of a Broken Periodontal Instrument Tip

In the present case report presents a rather unique and rare case of a broken periodontal probe far away of the original area of application, i.e., the marginal periodontium. The case management is discussed, and the available literature highlighted

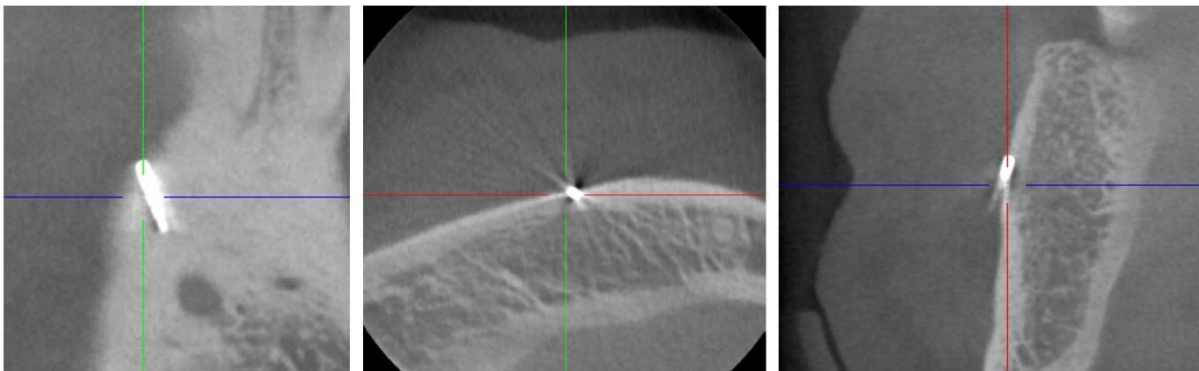
A 59-year-old patient came, for repair of a broken tooth in the maxillary left quadrant and clarification of therapy options for various other dental problems. On routine Orthopantomography (OPT), Region 45 showed a thin cylindrical, approximately 5 mm

(coronal-apical) metallically dense opacity in the OPT (Figure 1).



For the presurgical planning, a three-dimensional imaging using cone-beam tomography (CBCT) was made (Figure 2), using a MORITA 3D Accuitomo 170 (MORITA Europe, Jordi Röntgentechnik AG, Münchenstein, Switzerland) with a spatial resolution (voxel edge length) of 0.08 mm. The recording time was 17.5 s at 90 kV and 5 mA (pulsed).

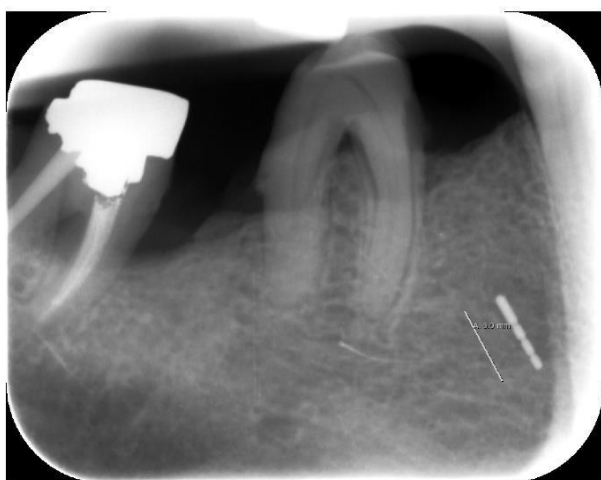
Fig. 2: Cone-beam tomography showing the metallic opacity compatible with a broken tip of a periodontal probe. No close relationship to the mental nerve canal or supplying vessels was evident.



An opacity corresponding to the findings described in the OPT, but buccally perforating the cortical bone, was found. The shape, which was typical for a periodontal probe of the type AE P OWB (Michigan O with Williams Markings), led us to suspect that it was a broken periodontal probe tip made of medical steel. A possible differential diagnosis could be excluded with certainty, despite some artefacts.

Unfortunately, no older X-rays were available. The single tooth X-ray taken in our clinic in December 2019 clearly identified the broken periodontal probe in two dimensions (Figure 3).

Fig 3. Periapical X-ray with the broken periodontal probe



Based on the X-ray findings and visible markings on the metal object, it was surmised that this was a broken periodontal probe tip. It appeared to be either a PCPUNC-15 or AE P OWP, both of which are similar, although the latter is shorter and does not have a 4 mm marking. The definitive identification could only be made after removal when we were able to measure and assign the fragment tip accordingly (Figures 5 and 6). region 45 was operated and the fractured instrument tip removed.

Fig. In situ image showing the removal of the broken periodontal probe tip from buccal, which was removed with pliers after careful luxation.

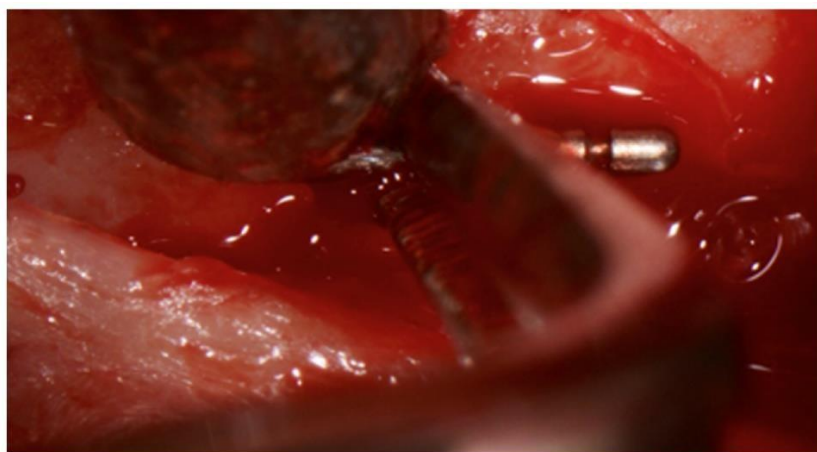


Fig. : The surgically removed fragment tip of a periodontal probe type AE P OWP.



Dentists should always take particular care when working with any instrument in poorly visible areas such as in this case a periodontal pocket or alveolus, as in this case. A radiography study should be conducted when instrument breakage occurs. If an unexpected accident takes place during a surgical procedure, the patient must be informed in accordance with ethical codes, and suitable measures adopted to resolve the issue.

Source: Kaufmann C et al. Dent. J. 2020, 8(2), 55; <https://doi.org/10.3390/dj8020055>



This scientific input is prepared from the Department of Medical Services, an initiative of M/s Micro Labs Limited under the aegis of Micro Knowledge Academy. The information contained herein is for education purpose only. The content is developed by compiling information from various authentic and published literatures. Although great care has been taken to assure the accuracy of the publication, M/s Micro Labs Limited shall not be responsible or in any way liable for any inaccuracy, errors, or omissions resulting from negligence or otherwise howsoever or any consequences arising there from. In spite of best efforts, the information in this publication may become outdated over time. M/s Micro Labs Limited shall not be responsible in any manner whatsoever, for any action taken, opinions expressed, advice rendered or accepted, any direct, incidental, special or consequential loss and damage caused on the basis of any material or information presented in this publication / update