



SMART DENTAL UPDATES

Vol 2 | Issue 25 | 2021

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 contain

- Thermography as a non-ionizing quantitative tool for diagnosing periapical inflammatory lesions
- Periodontal status in long-term orthodontic retention patients
- Restoration of Primary Anterior Teeth with Glass Fibre-Reinforced Post and Core.

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Looking forward to your valuable feedback

Best Regards,
Medical Team, Micro Labs Limited



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Thermography as a non-ionizing quantitative tool for diagnosing periapical inflammatory lesions

Pulpal lesions or disrupted periodontal attachments result in the formation of Periapical inflammatory lesions which extend to the apex, furcation or lateral canals. Vascular and anatomic connections between the pulp and periodontium are the consequences of periapical lesions.

Thermography is an effective, quantitative and nonionizing approach that can be used for the diagnosis of periapical inflammatory lesions.

The objective of this study was to assess validity of thermography for the diagnosis of periapical inflammatory lesions and comparing it with reference-standard, X-ray radiographs and this study also evaluated the temperature ranges for acute pulpitis with apical periodontitis lesions and acute and chronic periapical abscess lesions.

All the subjects underwent comprehensive dental, intraoral, and extraoral diagnostic examination procedures. Acute pulpitis with apical periodontitis (AAP), acute periapical abscess (AA) and chronic periapical abscess (CA) were diagnosed based on clinical and radiographic criteria. FLIR E-5 Infrared Camera with MSX was used to acquire thermographic data to provide a guided trajectory for the infrared camera A profile-guided thermography scanner was designed which was used as an offset contour of the human mandible to maintain the camera in a position such that it faced the subject. Before the procedure the subject was told to rinse their mouths with cold water and then 3 extraoral thermal view images were taken from the front and right and left sides of patients whose mouths were closed. This procedure was repeated for 5 times . From the palatal perspective intraoral thermal image was taken. Agreement in the diagnoses based on the combination of clinical and radiographic assessments and the thermographic evaluation was calculated and the temperature ranges between the 3 diagnostic subgroups were also measured.

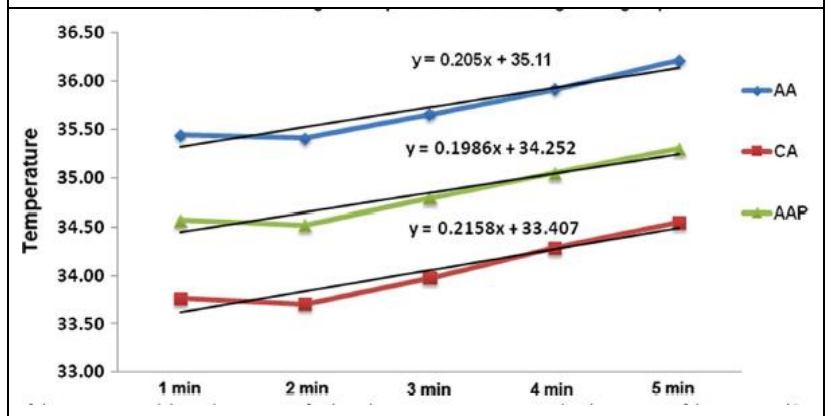


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Out of 80 subjects, 42 were female and 38 males were enrolled in this study. Twenty-seven patients were diagnosed with acute periapical abscess (AA), 29 patients were diagnosed with chronic periapical abscess (CA), and 24 patients were diagnosed with apical periodontitis (AAP). Mean intraoral thermal image

Rates of change in extraoral thermal temperature for the 3 diagnostic groups



temperature acute periapical abscess for was 37.26 ± 0.36 , that chronic periapical abscess was 35.03 ± 0.63 and apical periodontitis was 36.07 ± 0.45 .

Differences between the mean values of the intraoral thermal images' temperatures of the three diagnostic groups

Investigators' diagnosis		Mean difference	SE	P value	95% confidence Interval	
					Lower bound	Upper bound
AA	CA	2.2	0.1	<0.001	1.9	2.6
AA	AAP	1.2	0.1	<0.001	0.8	1.5
AAP	CA	1.0	0.1	<0.001	0.7	1.4

In conclusion, Thermography is effective, quantitative and nonionizing approach in the diagnosis of AAP, AA, CA . This study showed that High thermal image temperatures were recorded for acute periapical abscess. To detect inflammatory reactions during the preclinical stage thermography is useful leading to early diagnosis.

Reference: Aboushady MA, Talaat W, Hamdoon Z, Elshazly TM, Ragy N, Bourauel C, Talaat S. Thermography as a non-ionizing quantitative tool for diagnosing periapical inflammatory lesions. BMC Oral Health. 2021 May;21(1):1-7.



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Periodontal status in long-term orthodontic retention patients

Orthodontic treatment aims to establish good functional and aesthetic occlusion and to ensure long-term preservation of oral health. The objective of this study to investigate the periodontal status in long-term orthodontic retention subjects and to assess possible risk indicators.

In this Cross sectional study 211 subjects were included who had undergone routine orthodontic retention control between three to ten years after orthodontic treatment. All the subjects were clinically examined for periodontal parameters such as Plaque index (PI), Gingival index (GI), Probing pocket depth (PPD), Gingival recession (GR) and Calculus.

211 patients with mean age 20.9 years were included in this study. Plaque Index mean values were higher in the mandible than in the maxilla and Gingival index was between 0.1 (± 0.4) on the maxillary palatal surfaces and 0.3 (± 0.7) on the mandibular labial surface. Subjects with retainers and in smokers the Plaque index score in the maxilla on the palatal aspect was increased. Higher age was associated with a high PI score in the mandible and having a retainer was not a significant risk indicator for plaque accumulation. Higher GI score was significantly associated with smoking. The duration of orthodontic treatment was associated with a higher GI score for the lingual mandibular surface.

Clinical predictors of gingival index. Regression coefficients with standard errors in brackets.

Independent variables	Maxilla		Mandible	
	Labial	Palatal	Labial	Lingual
Retainer in the maxilla	0.13 (0.07)	0.05 (0.06)		
Retainer in the mandible			-0.07 (0.11)	-0.03 (0.10)
Age	-0.01 (0.02)	-0.01 (0.02)	0.04 (0.03)	0.02 (0.03)
Female	0.003 (0.07)	0.03 (0.06)	0.02 (0.10)	-0.09 (0.09)
Smoking	0.46 (0.20)*	0.63 (0.16)**	0.51 (0.27)	0.30 (0.24)
Use of snuff	-0.16 (0.12)	-0.06 (0.10)	-0.15 (0.16)	-0.07 (0.14)
Number of tooth extractions	-0.002 (0.02)	-0.02 (0.02)	-0.01 (0.03)	-0.02 (0.02)
Duration of orthodontic treatment in months	-0.01 (0.004)	-0.0004 (0.003)	-0.01 (0.01)	-0.01 (0.005)*
Years since debonding	0.03 (0.03)	0.03 (0.02)	-0.03 (0.03)	0.002 (0.03)

* $p < .05$, ** $p < .01$



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Longer duration of orthodontic treatment, was associated with increased Probing pocket depth score. Labial and lingual aspects in the mandible showed that male gender was associated with increased Probing pocket depth score and GR was higher in subjects who smoked. use of snuff was associated with the presence of GR in the maxilla on the labial side. In the mandible Having fixed retainers and older age were the only variables significantly associated with increased calculus.

Clinical predictors of calculus index. Regression coefficients with standard errors in brackets.

Independent variables	Mandible
	Lingual
Retainer in the mandible	0.23 (0.07)*
Age in years	0.05 (0.02)*
Female	0.03 (0.07)
Smoking	−0.16 (0.18)
Use of snuff	0.10 (0.11)
Number of tooth extractions	0.01 (0.02)
Duration of orthodontic treatment in months	−0.001 (0.003)
Years since debonding	−0.04 (0.02)

In conclusion, periodontal health seemed to be well-maintained in subjects with long term orthodontic retention. Fixed retainers alone were not associated with detrimental effects on periodontal health. Long term orthodontic retention treatment generally appears to be safe. Additional factors such as Age and gender may increase the risk of plaque deposits and increased probing pocket depths.

Reference: Salvesen BF, Grytten J, Rongen G, Koldsland OC, Vandevska-Radunovic V. Periodontal status in long-term orthodontic retention patients up to 10 years after treatment—a cross-sectional study. Acta Odontologica Scandinavica. 2021 May 7:1-7.



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Restoration of Primary Anterior Teeth with Glass Fiber-Reinforced Post and Core

Patient Description: 4-year-old female subject presented with dental pain in the anterior maxillary teeth. The patients' parents asked for the treatment so that the dental pain is relieved and restore the esthetic appearance for the patient.

Dental examination showed- destructed anterior maxillary teeth and bad oral hygiene of the remaining teeth. Dental history revealed bad oral hygiene and destructed anterior teeth. The dental examination showed retained roots of 51, 52, 61, and 62. Mobility and a bad prognosis for any future restoration was showed in 62nd root.

Intraoral radiograph showed pulp involvement of 51, 52, 61, and 62 and showed root resorption. root canal filling for 51, 52, and 61 with fiber post and strip composite crown and extraction of 62 was decided by the dentist. Pulp chamber was opened, pulp tissue was extirpated. Working length determination was carried out by IAPA film. For all the canals proper irrigation with 2.5% of NaOCl and normal saline was performed. Paper points were used to dry the canals and to fill the canals Vitapex was used. Opened canals were closed with a temporary filling.

After 1 week preparation of the fiber post space was done which required removal of 4-5mm of the endo paste from the canal and cleaning with saline and dried with air. Spaces made for the post were acid etched, rinsed, and dried. Flowable composites were inserted in the post spaces before the placement of the fiber post and then, the post was introduced to the space with the composite inside. Light cure was used in the coronal area was etched, washed, and bonded. Strip crowns were filled with composite and later were placed on 51, 52, and 61. Then, the final coronal restoration was cured with a light cure, 62 was extracted, and an IOAR was taken to keep the follow-up record.



Final coronal restoration



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The subject returned after 2 months for IOAR and a checkup and reported no pain or discomfort. The crown of 52 fell and was lost and the canal obturated, and the efforts for repeating the crown failed.

The subject returned for another visit on March 2017, and the dentist took IOAR. Radiograph showed that there was normal physiological root resorption with no complaint or mobility. On June 2018, the subject had the complaints of the mobility of the 3 teeth which required the extraction. On July 2018, the patient came with complete healing of the anterior maxillary area. During her last visit four anterior teeth, both maxillary centrals and laterals, fully erupted in the oral cavity.



Eruption of anterior permanent incisors

In conclusion, Retention of primary teeth is one of the challenges in pediatric dentistry. For child medical, physical, and psychological conditions restoration of primary decayed incisors is important. A glass fiber-reinforced post and core is a strong retentive tool for composite crown retention for primary incisors. The case has interesting, promising results for future treatments for traumatic or carious anterior primary teeth.

Reference: Afraa S, Raghad H, Ayam K, Aeshah H. Restoration of Primary Anterior Teeth with Glass Fiber-Reinforced Post and Core: 3-Year Follow-Up Case Report. Case Reports in Dentistry. 2021 May 10;2021.



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