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Dear IFEA Committee,

With the present document I enquire the IFEA about the ending of the project that was supported by the IFEA Jean-Marie Laurichesse Research Grant Award.

Below it is presented a report of the finished study:

Report

Aim To evaluate the accuracy of the ultrasound examination (USE) for the detection of artificial periapical bone defects when a complete erosion of the cortical bone plate is not present and to determine the minimum cortical thickness that constitutes a barrier for the ultrasound waves.

Methodology Sixty bovine anatomical blocks were harvested and uniformly distributed among 6 experimental groups. The negative control group where no intra-bony defect was produced. The positive control group with experimental lesions of 2.0 mm of diameter perforating the cortical bone plate. Two experimental groups where small (2.0 mm) and large (5.0 mm) artificial defects were created and masked by a cortical bone plate thinned at different thicknesses. Two experimental groups where small (2.0 mm) and large (5.0 mm) artificial defects were created and covered by the whole cortical bone plate. The USE was performed, and the scans were saved and submitted to 3 blinded examiners. Sensitivity, specificity, predictive values and Receiver-operating characteristics (ROC) analysis were carried out. The significance of the findings ($P < 0.05$) was appraised using the chi-square statistics and applying the Yates correction and intra and inter examiner agreement evaluated through Kappa statistics.

Results USE showed a high sensitivity value of 97.3% and a high negative predictive value of 0.89 and a perfect score for the specificity and positive predictive value. The ROC curve analysis showed an accuracy of 97.8%. The Kappa analysis showed a k-value of 0.86 and 0.89 at first and second examination demonstrating an almost perfect inter-observer agreement. The intra-observer agreement was almost perfect with a k-value of 0.92. A statistically significant correlation between the echographic diagnosis and the presence or absence of artificial intra-osseous lesions in the anatomical blocks was obtained ($P < 0.0001$).

Conclusions USE demonstrated a high accuracy and reliability to detect central lesions within the maxillary bones independently from the presence of a partial or complete erosion of the cortical bone plate."

The whole manuscript will be submitted within the following month to the International Endodontic Journal acknowledging the IFEA.

Kind Regards,

Dr Davide Musu