

## Histological and immunohistochemical analysis of the bone-implant interface during early phases of osseointegration in different bone defects

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The present study aimed to evaluate the histological features of bone healing around dental implants placed in bone defects of different sizes [1]. In the mandible of 12 Labrador dogs the premolar and molar teeth were extracted bilaterally. After 6 months of healing six implants were placed in two conventional sites, in two sites with a marginal gap of 0.5 mm (small defects) and in two sites with a marginal gap of 1.25 mm (large defects). Bone biopsies harvesting was scheduled in order to obtain healing times of 5, 10, 20 and 30 days. Before decalcification with EDTA was completed, mesial and distal cuts parallel to the long axis of the implant were made through the tissues and a buccal and lingual portion of the tissue block were separated from the implant. The soft tissue portions were dehydrated in ethanol, embedded in paraffin and sectioned with the microtome set at 7  $\mu$ m. Mayer-Haematoxylin/Eosin was used to show the presence of the inflammatory infiltrate and to evaluate the percentage of newly formed microvessels at the different time points around the implants. Picrosirius Red was used to evaluate the collagen content while polarized light was used to enhance the birefringency of the staining and show collagen bundles distribution [2]. Immunohistochemistry with osteopontin (OPN) was performed to evaluate its distribution. In all groups, angiogenesis increased from 5 to 20 days and then decreased slightly. The collagen distribution had a similar behavior. In all defects, OPN expression increased until the 10th day, decreased at 20 days and then stabilized. Control sites showed a lower percentage of OPN compared to the sites with marginal gaps. The small defects showed the highest OPN concentration and the largest value of collagen content. Apparently a small marginal gap around the dental implant during the early phases of healing may accelerate bone regeneration.

### References

- [1] Rossi F. et al. *Clin Oral Implants Res.* 2012;23(1):41-8.  
[2] Yamano S. et al. *Clin Oral Implants Res.* 2011;22(8):815-9.

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