

# Influence of Implant Microstructure on the Osseointegration of Immediate Implants Placed Into Periodontally Infected Sites. A Histomorphometric Study in Dogs

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## Abstract

The aim of this study was to evaluate the influence of implant microstructure on the osseointegration of immediate implants placed into infected sites. During 12 weeks periodontitis was induced in 6 dogs in the areas of the first to fourth mandibular premolars of both sides. The teeth were extracted and the implants were placed immediately. Implant placement was randomly assigned so for each side in the mandible a different FRIADENT implant surface (DENTSPLY Friadent Mannheim, Germany), Friadent Experimental Surface (grit blasted/acid etched, group 1) or titanium plasma spray surface, group 2, was used totaling 36 implants in the experiment. The animals were sacrificed 12 weeks after implant placement. Two histomorphometric analysis were performed: percentage of bone/implant contact (BIC) and analysis of the bone density in adjacent and distant areas from the implant surface. The results showed that the percentages

of BIC were 52.7% and 42.7% for groups 1 and 2 respectively. The bone density analysis revealed that the percentages of bone in the adjacent areas were 66.6% and 58.8%, and in the distant areas from the implants were 58.7% and 55.8% for groups 1 and 2 respectively. The mean differences of BIC were verified through the Mann-Whitney test and differences in bone density, through the Kruskal-Wallis test. The differences were not statistically significant ( $p > 0.05$ ).

In conclusion, osseointegration of implants placed into a more challenging healing situation such as immediate implants into periodontally compromised sites was successful for both surfaces, however the grit blasted/acid etched surface, although not statistically significant, had a slightly better performance when compared to the titanium plasma spray surface for all the parameters studied.

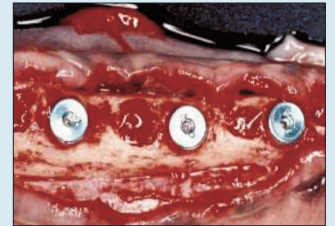
## Material and Methods



Periodontal disease induced

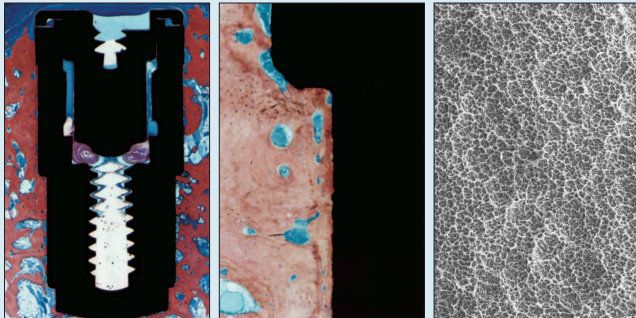


Bone loss after 3 months

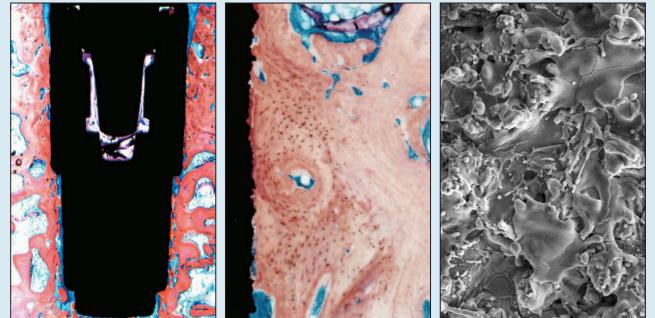


Implant placed immediately after extraction

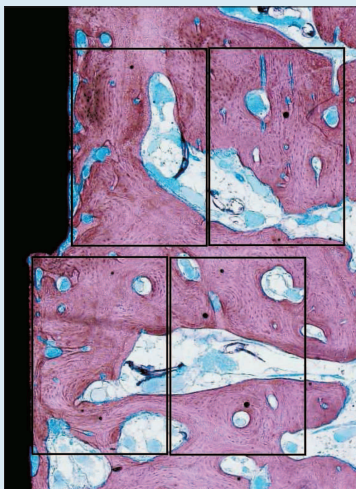
## Results



Bone implant contact of the FRIADENT Experimental Surface. Group 1



Bone implant contact of the titanium plasma spray surface. Group 2



Bone densities were determined by measuring the percentages of bone within the rectangles.

Adjacent area (%)		
	Group 1	Group 2
Mean ± SD	66.6 ± 13.3	58.8 ± 15.9

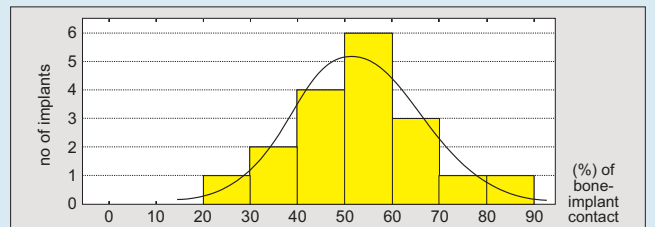
  

Distant area (%)		
	Group 1	Group 2
Mean ± SD	58.7 ± 15.4	55.8 ± 13.3

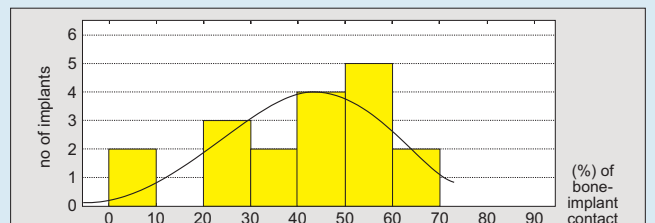
Percentage of the bone density in the adjacent and distant areas from the implant surfaces

Bone-implant contact (%)		
	Group 1	Group 2
Mean ± SD	52.7 ± 13.8	42.7 ± 18.0

Percentage of bone/implant contact



The histogram shows a normal distribution with the majority of the values for the group 1 surfaces (grit blasted/acid etched) concentrated around the mean.



The histogram shows the dispersion of the osseointegration values for the titanium plasma spray surface, group 2.

