
Purpose: The aim of the current experiment was to study the progression of peri-implantitis around implants with different surface roughness (sandblasted acid etched surface (SLA) or a polished surface (P))

Material and Methods: In five beagle dogs, three implants with either a SLA or P surface were installed bilaterally in the edentulous premolar regions (split mouth design). All implants were made of c.p. titanium and had a diameter of 3.3mm and a length of 8mm. The surface roughness, expressed in Sa-values according to an interferometry technique described by Wennerberg & Albrektsson (2000), was about 0.35 mm for the polished implants and 2.29 mm for the SLA implants (Sennerby et al. 2005). After 3 months on a plaque control regimen, experimental peri-implantitis was induced by ligature placement and plaque accumulation was allowed to progress until about 40% of the height of the supporting bone had been lost. After this 4-month period, ligatures were removed and plaque accumulation was continued for an additional 5 months. Radiographs of all implant sites were obtained before and after ‘active’ experimental peri-implantitis as well as at the end of the experiment. Biopsies were harvested and the tissue samples were prepared for light microscopy. The sections were used for histometric and morphometric examinations.

Findings: The radiographic examinations indicated that similar amounts of bone loss occurred at SLA and P sites during the active breakdown period, while the progression of bone loss was larger at SLA than at polished sites following ligature removal. The histological examination revealed that both bone loss and the size of the inflammatory lesion in the connective tissue were larger in SLA than in polished implant sites. The area of plaque was also larger at implants with an SLA surface than at implants with a polished surface.

Conclusions: It is suggested that the progression of peri-implantitis, if left untreated, is more pronounced at implants with a moderately rough surface than at implants with a polished surface.

Purpose: The objective of this manuscript was to critically comment on this trend by interpreting scientific data currently available on the management of hard and soft tissues surrounding two-piece implants with turned and microtextured collars.

Conclusions: For an implant restoration to be a success, it should closely resemble what once existed in nature from a functional and an esthetic point of view, thereby including the need for preserving or even recreating hard and soft tissues. A roughened implant surface has shown significant biomechanical advantages over a turned surface. Peri-implant bone remodeling is mainly driven by the establishment of the biologic width. Other factors have been described showing a possible impact on crestal bone levels. Based on long-term comparative studies currently available, it is unclear whether microroughened implant necks reduce crestal bone loss. More long-term, prospective, comparative studies using one implant system and monitoring crestal bone changes from fixture placement are needed to elucidate the impact of collar surface roughness on bone remodeling. As the implant collar surface roughness varies, there is little difference in the orientation and attachment of the collagen fibers in the peri-implant mucosa. Consequently, microroughened implant collars do not provide an obvious advantage over smooth collars. The clinician should be cautious when using these modified implants because the long-term impact of microtextured collars on the initiation and progression of peri-implant pathology is unknown.