

Contour analysis of an implant-soft tissue interface

Type: Article

Abstract:

Background and Objective: Studies of peri-implant soft tissue on invivo models are commonly based on histological sections prepared using undecalcified or fracture' techniques. These techniques require the cutting or removal of implant during the specimen preparation process. The aim of this study is to explore a new impression technique that does not require any cutting or removal of implant for contour analysis of soft tissue around four types of titanium (Ti) surface roughness using an invitro three-dimensional oral mucosal model (3D OMM). **Methods:** The 3D OMM was constructed by co-culturing a keratinocyte cell line TR146 and human oral fibroblasts on to an acellular dermis scaffold. On the fourth day, a Ti disk was placed into the model. Four types of Ti surface topographies, i.e. polished, machined, sandblasted and anodized were tested. After 10 d of culture, the specimens were processed based on undecalcified (ground sectioning), electropolishing and impression techniques for contour analysis of the implant-soft tissue interface. **Results:** Under light microscopic examination of the ground and electropolishing sections, it was found that the cell line-based oral mucosa formed a peri-implant-like epithelium attachment on to all four types of Ti surfaces. In contour analysis, the most common contour observed between the cell linebased oral mucosa and Ti surface was at an angle ranging between 45 and 90. **Conclusion:** The in vitro cell line-based 3D OMM formed a peri-implant-like epithelium at the implant-soft tissue interface. The contour of the implant-soft tissue interface for the four types of Ti surface was not significantly different.

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