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Transplantation of Tissue Engineered Autogenous Keratinocyte Grafts for Peri- Implant Soft Tissue Augmentation

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Introduction

In patients with severe atrophies of bone, the placement of dental implants with or without bone grafting often is the only possibility for oral rehabilitation. The success is still limited due to an unfavourable soft tissue situation. A tensionfree wound closure is necessary and often achieved only by a periosteal release-incision, this may result in a deficit of keratinized mucosa after uncovering of the implants.
For a good functional and esthetic longterm result, often soft tissue augmentation procedures have to be performed. Connective tissue grafts and free gingival grafts are recommended as standard procedures to create a stable peri-implant surrounding. Disadvantages are the morbidity and the size limitation of the donor site area.

Material and Methods

Case Presentation:
3 months after implant insertion (ITI-System) into a cortico- cancellous bone graft from the iliac crest, a gingival biopsy of 9 mm2 is harvested for tissue engineering of an autogenous keratinocyte graft. After a culturing period of 4 weeks a resorbable membran (Tissue Foil, Fa. Baxter) is covered with the in vitro cultured keratinocytes and placed on top of the wound site after peri- implant vestibuloplasty. An acrylic splint is fixed on the implants for 10 days. Prosthetic treatment is finished 4 weeks after soft tissue surgery.

Results

Between June 1999 and December 1999 5 augmentative procedures using tissue engineered autogenous keratinocyte grafts were performed.

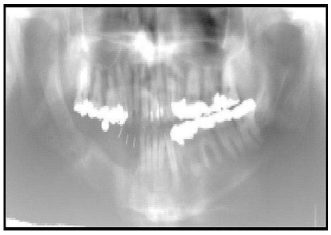

Fig. 1: Preoperative x-ray for implant insertion. A cortico-cancellous bone graft from the iliac crest was inserted for bone reconstruction after tumor resection of the mandible.

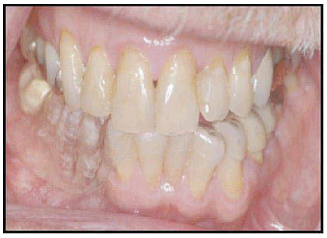

Fig. 2: Casts for planning of the prosthodontical desired implant positon. Insertion of osseo-integrated implants (ITIâ- System) was performed three months after bone transfer.

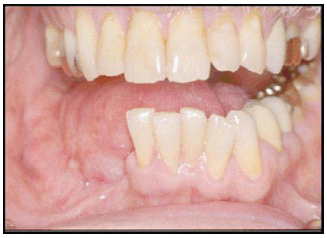

Fig. 3: Clinical situation after implant insertion.

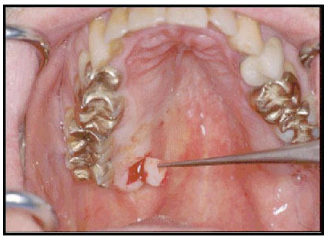

Fig. 4: Harvesting a small biopsy from the palate for engineering autogenous keratinocyte grafts.

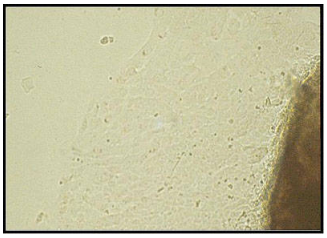

Fig. 5: Microscopical view showing centrifugal keratincyte growth (K).

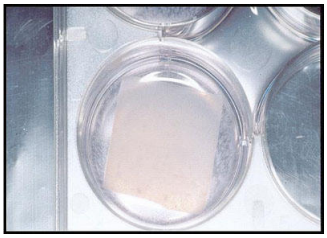

Fig. 6: Aspect of a container for engineering autogenous keratinocyte grafts.

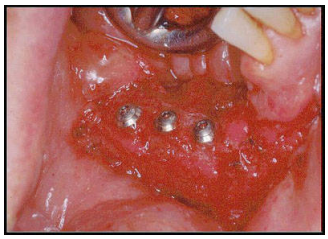

Fig. 7: Intraoperative aspect of the vestibular plastiy.

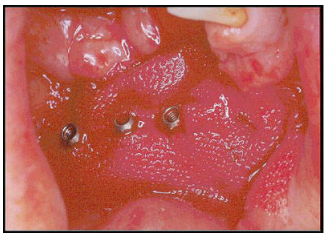

Fig. 8: Intraoperative aspect of insertion of the resorbable membran (Tissue Foil) covered with cultured keratinocytes.

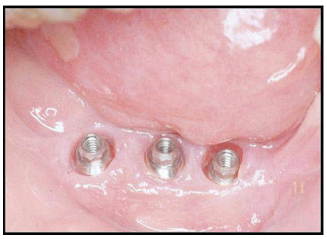

Fig. 9 : Clinical aspect 4 weeks after soft tissue augmentation with cultured keratinocytes.

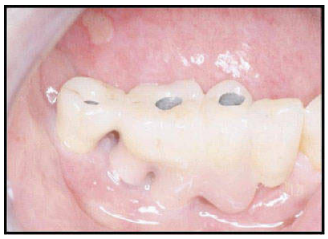

Fig. 10 : Lateral view after insertion of the implant borne bridge.

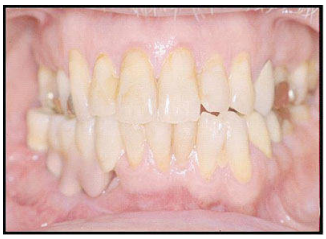

Fig. 11 : Frontal view after prothetic rehabilitation.

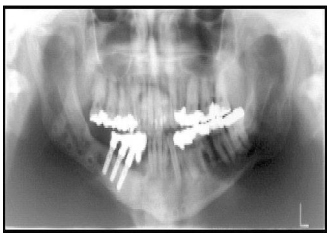

Fig. 12 : Panoramic x-ray of the inserted implants with the implant borne bridge.

Discussion and Conclusions

The clinical results show that transplantation of in vitro cultured autogenous keratinocytes are an additional alternative for soft-tissue augmentation and may replace soft tissue grafts in selected indications.

Literature

- Castro- Munzeledo F., Hernadez-Quintero M., Marsch-Moreno M., Kuri-Harucuch W (1997): Cultivation, Serialtransfer and Differentiation of Epidermal Keratinocytes in Serum- Free Medium. Biochem Biophys Res Com 236: 167-172
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Poster Faksimile:

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STRICKER, A[1], LAUER, G[1], HÜBNER, U[1], SCHMELZEISEN, R[1]
[1] Department of Oral and Maxillofacial Surgery, University Hospital Freiburg, Germany

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The success is still limited due to an unfavourable soft tissue situation. A tensionfree wound closure is necessary and often achieved only by a periosteal release- incision, this may result in a deficit of keratinized mucosa after uncovering of the implants.

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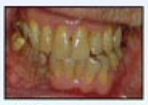
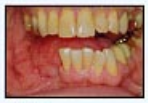


Fig. 2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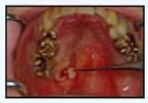
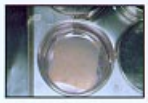


Fig. 4

Fig. 5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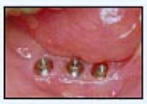
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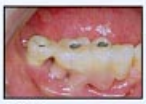
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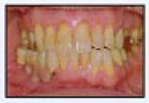
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