



Prospective, controlled immunohistological evaluation of the soft tissue surrounding dental implants after tissue thickening with an acellular porcine dermal matrix

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Introduction

The challenge

- Lack of sufficient peri-implant gingival volume
- Finding alternatives for autologous tissue grafts



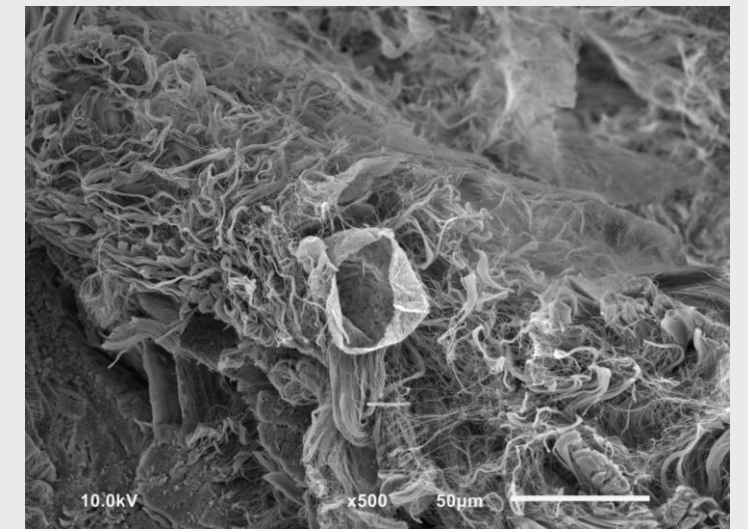
Example of a thin gingival phenotype (left) and thick gingival phenotype (right) (Richter et al., 2018)

The aim

To evaluate the integration of an acellular porcine dermal matrix into the oral mucosa over dental implants.

This involves examination of the immune reaction to the xenogenic material by immunohistological detection of T cells and B cells or myeloid cells.

Electron micrograph of the acellular dermal matrix; 500x magnification (Prof. Dr. Ali Al-Ahmad)



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Materials & Methods

Implant placement

Control group



Without acellular porcine dermal matrix (n=16)

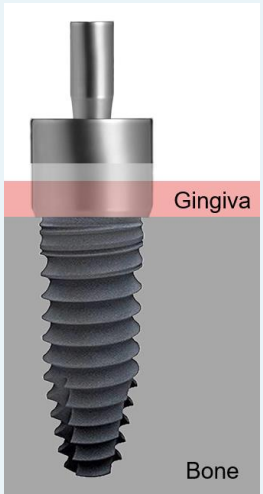
Test group



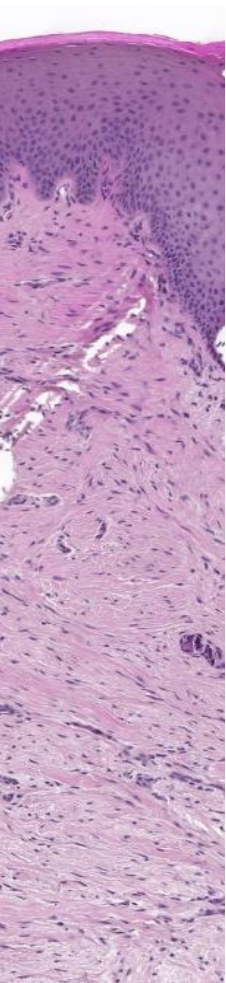
With acellular porcine dermal matrix (n=9)

After
3 months

Transgingival biopsy



(Immuno-) Histological analysis

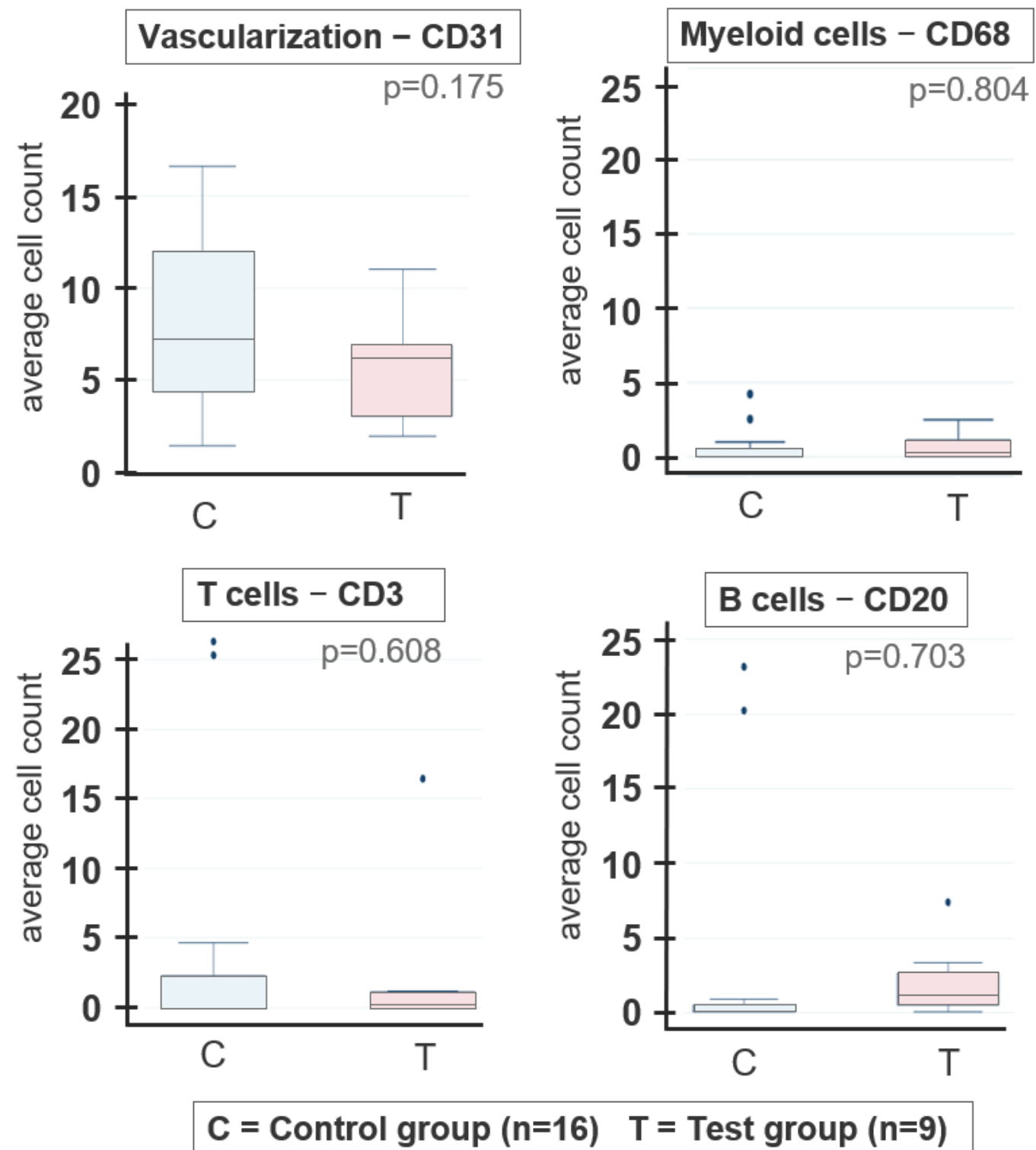


H&E stain
of a biopsy

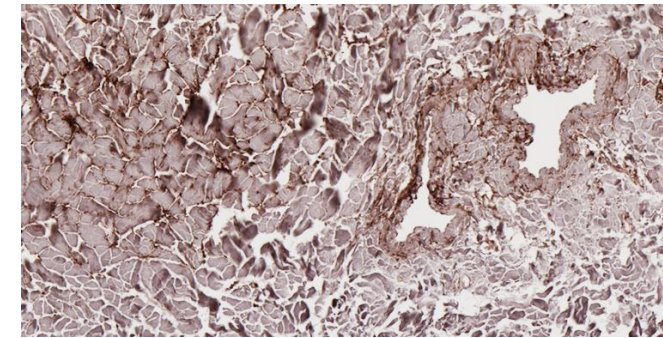
- Epithelial thickness
- Vascularization – CD31
- T cells – CD3
- B cells – CD20
- Myeloid cells – CD68
- Anti-pig – α -GAL-epitope

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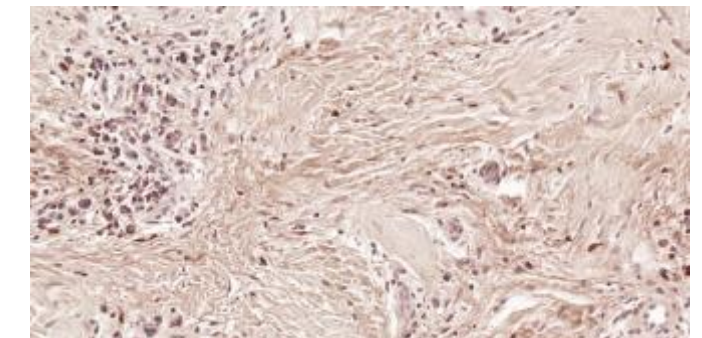
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Results



Native porcine matrix:
Positive for porcine antigens



Test sample at 3 months :
Negative for porcine antigens

- Soft tissue healing was uneventful in all patients
- Porcine antigens (α -GAL-epitope) detectable in native matrix
– not detectable after three months of healing
- No significant differences were found concerning the:
 - thickness of the epithelium
 - extend of vascularization
- The mean immune cell expression (CD 68,3,20) was comparable test and control group

Conclusion

- No signs of chronic inflammation (e.g. increased immune cell infiltration, hypervascularization) were seen after 3 months of healing, when using a porcine acellular dermal matrix for soft tissue thickening
- The porcine α -GAL-epitope could not be found 3 months after healing
- Further studies are needed to examine the volume gain and its volume stability