

PR-II-17. Autotransplantation using the acellular dermal matrix seeded by periodontal ligament fibroblasts in minipig: histological evaluation as potential periodontal ligament substitutes

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Background

To examine the possibility of periodontal ligament regeneration when autotransplantation was used by the periodontal ligament fibroblasts cultured on the acellular dermal matrix in teeth without a periodontal ligament.

Materials and method

One minipig was used in this study. The mandibular and maxillary permanent incisors were extracted for the culture of the periodontal ligament cells. The periodontal ligament cells were embedded in the acellular dermal matrix(AlloDerm®). The roots of the unextracted teeth were classified into a positive control group, in which the normal periodontal ligament was preserved. The roots of the extracted teeth were divided into the following two groups: The negative control group, in which the periodontal ligament had been removed and the acellular dermal matrix was not applied; and an experimental group, in which the periodontal ligament had been removed and periodontal ligament fibroblasts cultured on an acellular dermal matrix was applied. The mandibular premolars on both sides were extracted to provide recipient beds for the transplantation of the roots. The prepared teeth were transplanted, and completely submerged using physical barrier membranes. The animal was sacrificed 4 weeks after the autotransplant. The transplanted teeth were examined histologically.

Results

1. The periodontal ligament was normal in the positive control group, and ankylosis was discovered on the denuded root surface in the negative control group.
2. Periodontal ligament-like connective tissue was found adjacent to the denuded root and the new cementum-like layer of hard tissue was formed in the ex-

perimental group.

3. No ankylosis was observed on the denuded root surface in the experimental group.

Conclusion

The periodontal ligament fibroblasts cultured on the acellular dermal matrix may play a role in regenerating the periodontal ligament-like tissue with new cementum-like tissue formation.