Infiltration of CD4+, CD8+ T Cells and IgM+ Cells in Guinea Pig-to-Rat Cryopreserved Tracheal Xenografts

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Abstract: Objective: To assess the effect of cellular and humoral immune mechanisms in obliterative airway disease (OAD) in rodent tracheal xenografts, the infiltration of CD4+, CD8+, and IgM+ cells was analyzed in guinea pig-to-rat cryopreserved tracheal xenografts by histopathologic and immunohistochemical staining. Methodology: Guinea pig or Brown Norway (BN) rat tracheas were transplanted into F344 rat peritoneal cavities. Those were then divided into three groups; consisting of a F344 rat syngenetic transplantation group (Group Ⅰ, n=8), a BN rat-to-F344 rat allotransplantation group (Group Ⅱ, n=12), and a guinea pig-to-F344 rat xenotransplantation group (Group Ⅲ, n=11). Results: In Group Ⅰ, the graft lumen showed almost a normal appearance. A mild proliferation of fibrous tissue was observed in Group Ⅱ, and luminal obliteration of the grafts was observed with a complete obstruction of the lumen by 2 weeks after transplantation in Group Ⅲ. There was no significant difference in the histopathologic scores between the 2-week cryopreserved grafts and, the 4-week cryopreserved grafts. CD4+ and IgM+ cell infiltrations were grade 0 in all of the grafts of Group Ⅰ. CD4+ and IgM+ cell infiltrations were grade 1 or 2 in 60% of the grafts of Group Ⅱ. All of the grafts of Group Ⅲ also showed a CD4+ and IgM+cell infiltration of grade 1 or 2. CD8+ cell infiltration of grade 1 or 2 was observed in 75% of the grafts of Group Ⅰ. In Group Ⅱ and Group Ⅲ, CD8+cell infiltration of grade 1 or 2 was found in all of the grafts. Conclusions: These findings suggest that the T-cell responses in grafts influence the occurrence of OAD and that humoral immune reactions may enhance the progression of occlusive lesions.

Key words: Tracheal transplantation, Obliterative airway disease, Xeno, Cryopreservation