Fat obliteration in paranasal sinuses: a comparative magnetic resonance imaging and histopathologic study

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OBJECTIVES: To assess postoperative changes after fat tissue obliteration of the paranasal sinuses with the use of magnetic resonance imaging (MRI) and correlate the findings with correspondent histology.

STUDY DESIGN: By using an animal model with fat obliteration of the maxillary paranasal sinus. METHODS: We correlated postoperative changes of the fatty tissues by means of histopathologic analysis and MRI. The study group included 15 rabbits undergoing autologous fat tissue obliteration of their maxillary paranasal sinus. After 1 month (n = 5), 3 months (n = 5),

and 6 months (n = 5), both MRI and histopathologic evaluations of the fatty tissue status were performed. Contrast enhanced MRI was used to identify vital fat tissue. Subsequently, MRI findings were compared with a correspondent histologic status and proliferative factors such as angio- and osteogenesis and presence of abundant granulocytes, macrophages, and giant cells.

RESULTS: After a period of 6 months, the obliteration sites in all animals showed vital fat tissues, whereas at 1 month after surgery, vital fat tissue was rarely observed. The microscopic appearance of the obliteration tissue after 1 month was characterized by fat tissue necrosis and distinct tissue reactions including blood vessel dilatation, abundant macrophages, granulocytes, and lymphocytes. MRI after 1 month showed a clear contrast enhancement because of the hyperemia and inflammation reaction.

CONCLUSION: Fat tissue transplants used for obliteration of paranasal sinuses are almost completely degraded after transplantation and replaced by vital fat tissue over a period of at least 6 months. Contrast enhanced MRI is a well-suited technique for follow-up imaging and assessing the transplant vascularization and tissue remodeling status.

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