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14. New Bone Formation after Sinus Lift Surgery

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This paper reports an animal experiment to confirm how new bone is formed in the space after lifting the sinus membrane by means of the sinus lift procedure. Both frontal sinuses in ten adult dogs (each around 10 kg in weight) were used. Under general anesthesia, an opening was made in both frontal sinuses. An implant was placed beside the opening after lifting the sinus membrane. The space caused by lifting the sinus membrane in the right frontal sinus was filled with bovine collagen sponge and the left space was left empty. The dogs were sacrificed at intervals of one week, one, two, three and six months. The frontal sinuses were then histologicaly observed.

Results

One week later coagulated blood and granulation tissue filled the space in the left sinus where no materials had been placed. A slight growth of new bone was noticed at the surface of the sinus wall bone. One month later the space contained new bone and fibrous connective tissue. Three months later the new bone formation reached it's peak. In the right sinus group where collagen material was used, severe inflammation was observed in the first month. New bone was noticed for the first time after one month. New bone in these cases was confirmed on the surface of the sinus wall bone and the bone fragment which was transferred into the sinus. On the other hand, no case showed new bone formation at the sinus membrane which was lifted. To sum up, in the cases where the space were left empty, 1) new bone began forming around one week after and reached its peak in the third month, and 2) new bone formed at the surface of the sinus wall bone and bone fragment.