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KOREAN ASSOCIATION OF ORAL & MAXILLOFACIAL SURGEONS

New Bone Formation in the Space after Lifting the Sinus Membrane—An Experimental Study Using Sinus Lift Procedure

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The report confirm experimentally how new bone is formed in the space after lifting the sinus membrane using sinus lifting procedure. We used the frontal sinus of dogs because it is similar in size and histological structure to the sinus membrane of humans maxillary sinus. Twenty adult dogs around 10Kg in weight were used. Under general anesthesia, an opening was made on both sides of the frontal sinus. An implant was placed beside the opening after lifting the sinus membrane. The space made after lifting the sinus membrane in the right frontal sinus was filled with collagen material and the left side space was left empty in group A.

In group B, the right side space was filled with bovine bone ceramics with collagen gel (Bonejecttm, Koken Ltd) and the left was only with bovine bone ceramics. The dogs were killed at intervals of one week, one, two, three and six months. The frontal sinuses were then histologically observed. The results where no materials was used in group A show that one week later coagulated blood and granulation tissue filled the space. One month later the space contained fibrous connective tissue and new bone. Three months later the size of the new bone reached it's peak. In the group of the right space where collagen material was used, severe inflammation was observed in the first month. New bone was observed for the first time in the cases of two month. It reached also it's peak in the three month. The group B showed that new bone in both space where Boneject or bovin bone ceramic granules were filled, started to form within one week and also reached it's peak in the three month. New bone in those cases was confirmed on the surface of the sinus wall bone and the bone fragment which transfered into the sinus. On the contrary, no case showed new bone formation at the sinus membrane lifted.

It concluded that 1)new bone starts to form within one month in the cases where the space is left empty, 2)biomaterials influence on the bone

formation, 3) new bone forms from the sites of the sinus wall bone and the bone fragment transferred.