



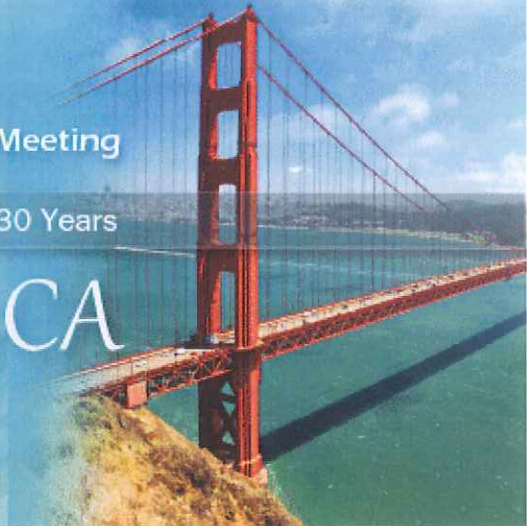
Academy of Osseointegration
30th Anniversary Annual Meeting

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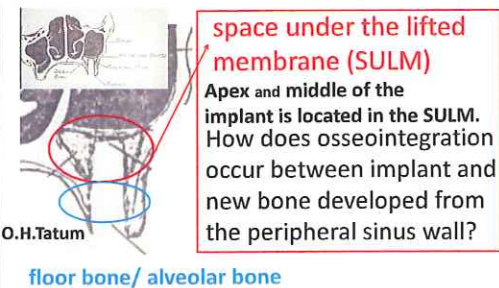


Osseointegration with New Bone in Sinus-lift and Simultaneous Implant Placement (SLSI) during Remodeling Phase - A Long-Term Experiment using Canine Frontal Sinus - Takao WATANABE Department of Anatomy, Kanagawa Dental University, Yokosuka, Japan



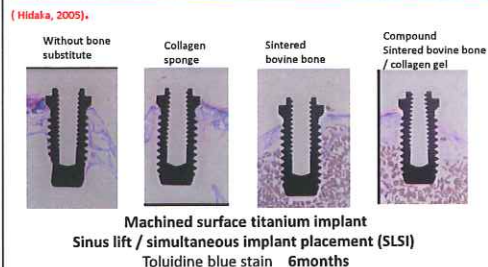
Background:

Sinus-lift with simultaneous implant placement (SLSI)



Our series of animal experiment of (SLSI) using dog frontal sinus

Histological Findings of New Bone in the SULM
Developing phase: After surgery, new bone developed from the sinus wall and its volume peaked at around 3 months (M). **Decreasing phase:** New bone gradually decreased. **Remodeling phase:** A small amount of new bone remained after 6M (Shimizu, 2003).
However, osseointegration of machined surface implants with new bone in the SULM was not observed

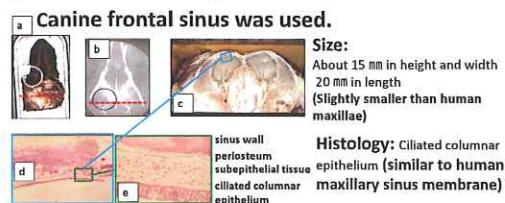


Objective:

Light-microscopically to observe osseointegration of new bone with **hydroxyapatite (HA) coated implant and rough surface (RS) titanium implants in the SULM in a long-term experiment of (SLSI) without bone substitute.**

Materials and Methods:

[outline of the experiment]



Seven beagle canines **28 total implants:** Size: 3.7 - 4.5 x 8.0 - 8.5(mm)

Female **HA group: 20 HA coated implants** (8 Calcitek - USA, 12 Kyocera - Japan)

Post-menopause **RS group : 8 rough surface implants** (8 ASTRA- Sweden)

14 frontal sinuses

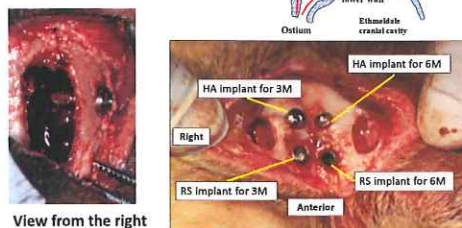
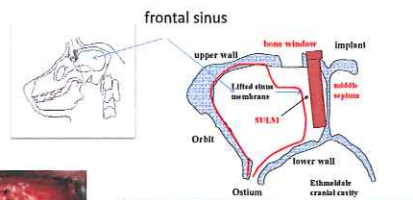
Duration: 3M, 6M, and 2 years (Y)
(long term findings during remodeling phase)

Bone substitutes: None
(findings without influence of substitutes)

Mechanical loading: None
(findings without influence of mechanical loading)

[surgical procedures / histological observations]

Implants were placed along the middle septum in the SULM at the right or left frontal sinuses. No bone substitutes were used.



View from the right bone window
The apex of the placed implant and blood clots can be seen.

Hematoxylin and eosin stained undecalcification sections were prepared. Then, histological observation and histomorphometric measurements were performed using light-microscopy.

Results :

Remaining new bone
matured trabecular bone

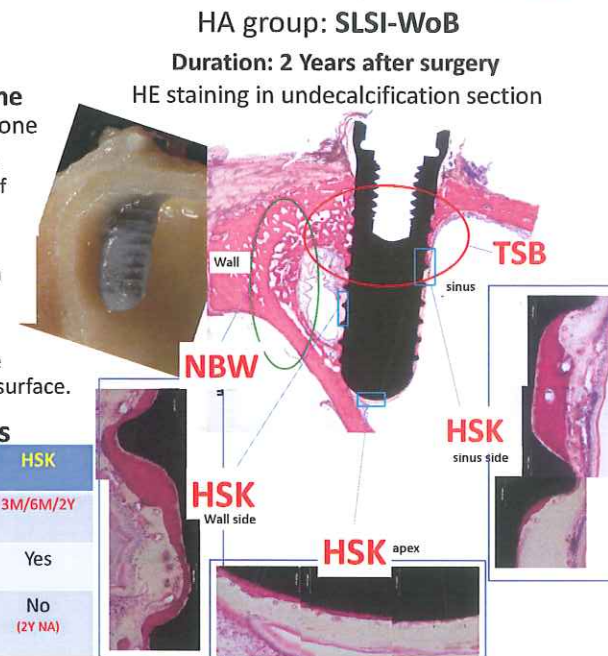
TSB: Tent-shaped new bone remaining around the base of the implant

NBW: New bone wall remaining at the site far from the implant.

HSK: Thin layer of osseointegrated new bone remaining on the implant surface.

Histological findings

Group	TSB	NBW	HSK
Duration	3M/6M/2Y	3M/6M/2Y	3M/6M/2Y
HA	Yes	Yes	Yes
RS	Yes (2Y NA)	Yes (2Y NA)	No (2Y NA)



TSB and NBW were seen in the HA and RS group. HSK was only seen in the HA group.

Histometric measurements

Group	new bone covering rate			new bone height			remaining new bone *BIC			osseointegrated hard tissue length		
	3M	6M	2Y	3M	6M	2Y	3M	6M	2Y	3M	6M	2Y
HA	64.3%	78.5%	56.7%	9.1mm	9.7mm	5.5 mm	79.9%	79.9%	92.1%	1mm	1mm	1.4mm
RS	49.0%	40.7%	NA	7.4mm	6.4mm	NA	3.8%	No contact	NA	0.1mm	NA	NA
Significant difference	(-)	P<0.01	NA	(-)	(-)	NA	P<0.01	(-)	NA	P<0.01	(-)	NA

* Bone implant contact rate

Discussion and conclusion:

Histometric measurement showed sufficient osseointegration with new bone at 3M, 6M, and 2Y only in HA group. However, in RS group, osseointegration did not occur.

It was concluded that

1. the implant surface property is an important factor to obtain sufficient osseointegration with new bone in one staged sinus-lift and
2. sufficient osseointegration of coating HA with new bone can be obtained and maintained for a long time during the remodeling phase.