APLI 台灣世界臨床雷射醫學會

亞太雷射醫學國際大會

雷射在牙周病與植牙及美學的臨床應用

特邀國際雷射大師Dr. Hisham Abdalla

Dr. Hisham Abdalla將於七月在峇里島舉辦的雷射專科特訓班，

632 Osseointegra on with New Bone in Sinus-li using Canine Frontal Sinus

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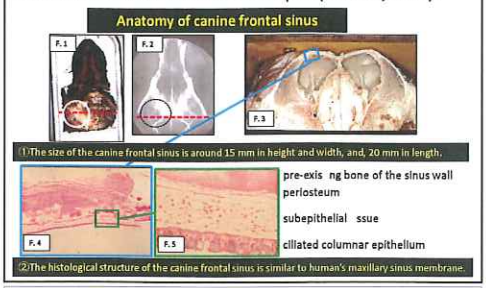
Background:

Sinus-li with simultaneous implant placement without the use of bone subs tutes is ideal surgery. In this surgery, the implant penetrates pre-exis ng bone of the sinus bo om wall and then the implant apex enters the space under the li ed membrane. We con rmed histologically that a er surgery, new bone developed from the sinus wall and surrounded the implant in the sinus-li experiment using canine frontal sinus which we developed (Shimizu, 2003).



Objec ve:

1) To light-microscopically observe the osseointegra on with new bone developed in the sinus-li experiment with simultaneous implant placement and without bone subs tutes using canine frontal sinus.
2) To inves gate the in uence of implant's properties; hydroxyapa te (HA)coa ng and rough surfaced (RS) tanium implants for osseointegra on with new bone.

Materials and methods:

- Six beagle canines
  Female, post-menopause
- 24 total implants
  HA group: 16 HA coa ng implants
  (8 Calcitek - USA, 8 Kyousera - Japan)
  RS group : 8 rough surface tanium implants
  (8 Astra - Sweden)

Surgical procedures:

①A er making a bone window, the sinus membrane was li ed to make a space and implants were simultaneously placed beside the medial septum.

②Bone subs tutes were not used.

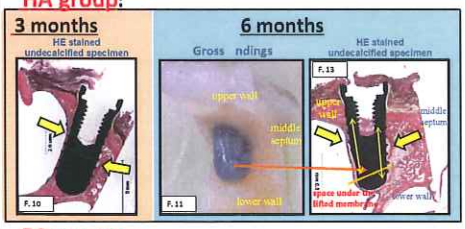
③At 3 (right sinus) and 6 months (le sinus) a er surgeries, HE stained undecalci ed specimens were prepared.

Histological observa ons: Light microscopic observa ons and histomorphometric measuremenst were carried out.

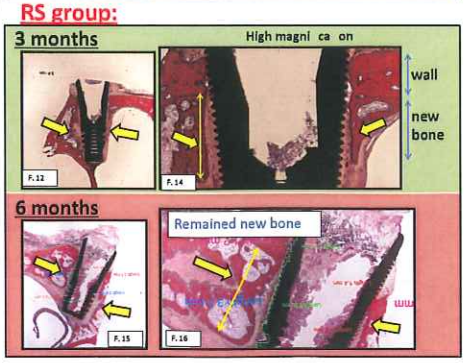
Results:

The allows show new bone at the site peripheral to the implant

HA group:



RS group:



1. New bone developed from the sinus wall and surrounded the implant at 3 months (F. 10, 12). **At 6 months, most new bone reduced, and a few new bone remained at the site peripheral to the implant** (yellow arrows) **in both groups** (F. 13,16).

2. Morphometric measurements also showed new bone at the site peripheral to the implant remained at 6 months in both groups.

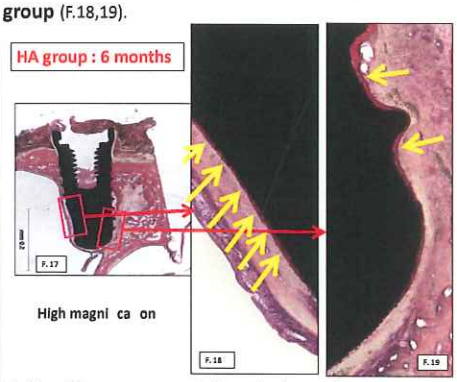
Height of new bone surrounding implants

	n	3 months	6 months
HA group	8	9.1±0.2mm	9.7±2.0mm
		P<0.05* ↕	P<0.05* ↕
RS group	4	7.4±1.0mm	6.4±1.0mm

Rate of osseointegrated new bone covering implants

	n	3 months	6 months
HA group	8	64.3±12.9%	78.5±8.8%
		P<0.05* ↕	P<0.01** ↕
RS group	4	49.0±17.1%	40.7±3.5%

3. Under high magni ca on, **a thin layer of new bone** (yellow arrows) **remained on most of the implant surfaces at 3 and 6 months only in the HA group** (F.18,19).



In the RS group, osseointegrated new bone was not seen. Instead brous connec ve ssue was at the site between the implant and new bone (F. 14, 16).

4. Morphometric measurements showed osseointegra on with new bone in the HA group was superior than the RS group.

Bone-implant contact rate (BIC) in osseointegrated new bone

	n	3 months	6 months
HA group	8	79.9±9.6%	79.9±14.7%
		P<0.01** ↕	
RS group	4	3.8±3.5%	—

Length of osseointegrated trabecula of new bone

	n	3 months	6 months
HA group	8	1.0±0.8mm 110 trabeculae	0.8±0.8mm 117 trabeculae
		P<0.01** ↕	
RS group	4	0.1±0.1mm 22 trabeculae	—

Discussion and conclusion :

The mechanism of the osseointegra on with new bone in the space is not fully understood. In this study, bone subs tutes were not used. Therefore, the factors in uencing the results were surgical s mula on such as li ing the membrane and implant use.

This study showed:

1. New bone developed from the sinus wall at 3 months(F.10,12), but at 6 months when s mula on decreased, almost all resorbed in both groups (13,16). It may indicate regenera ve reac ons caused by surgical s mula on.
2. Even if at 6 months, new bone at the site peripheral to the implant remained in both groups (F. 13,16). It may express foreign body reac ons against implants.
3. Osseointegra on with new bone in the space was observed superiorly in the HA group (F.18,19), and was not seen in the RS group (F.14,16). It may be in uenced by surface proper es of the HA implants.