

## Symposium I

### Innovations of implant surface modifications



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Titanium is good biomaterial for dental implant. Machined titanium surface was used in dental implant field for thirty years.

〈6 factors for osseointegration〉

- 1) Implant material
- 2) Implant design
- 3) Surface quality
- 4) Status of bone
- 5) Surgical technique
- 6) Loading condition

In implant surface reseraches, surface analysis is essential to quantativity, reproducibility and comparibility with other researches.

Quantative methods for surface topographical measurements

- 1) Contact methods : 2D, 3D stylus methods (Talysurf)
- 2) Non-contact methods
  - : Confocal Laser Scanning Microscopy (3D Top Scan)
  - : Optical Interferometry
  - : Atomic Force Microscopy

Chemical composition analysis methods : AES, RBS and XPS, XRD, Recently surface modified titanium impalnts showed better bone responses than machined implants. The surface modification methods can be :

- 1) 1st generation
  - Plasma spray coating : Titanium, HA

- 2) 2nd generation : To change surface topography
  - Blasting method : Astra, Retore RBM
  - Blasting + Etching : ITI, Frilait II
  - Double etching : 3i Ossootite
- 3) 3rd generation : To change surface compositions
  - IBASD, PVD etc: HA, TiO<sub>2</sub>, or DLC etc.
  - Thermal oxidation
  - Anodic oxidation
  - Fluoride modification
- 4) 4th generation : Cytokine, protein modification
  - Growth factors
  - ECM proteins, RGD
  - Tissue engineering

The evaluation methods for bone healing around surface modified implants.

- 1) Removal torque test
- 2) Histomorphometric analysis
- 3) Resonance Frequency Analysis
- 4) cDNA microarray

Why are the surface modified implants necessary ?

- 1) To reduce a implant failure at poor bone quality area
- 2) To achieve one-stage treatment modalities

## 약력

- 83년 서울대학교 치과대학 졸업
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