

Les nouvelles technologies et l'art dentaire

Dr Yann LE CORRE
Chirurgien-dentiste

D.U. d'applications médicales des lasers

Le Nitinol

- Projet du Naval Ordnance Laboratory, en 1962.
- Il s'ignifie : **N**ickel **T**itanium **N**aval **O**rdnance **L**aboratory, simplifié à NITI.
- La NASA s'y intéresse
- Le monde dentaire se l'accapare (1994) !
- Il supplante toutes les limes aciers ancestrales.
- Il diminue les risques dans la pratique quotidienne.

Courier de la NASA officiel

NASA CONTRACTOR REPORT

NASA CR-1232

CERTAIN PHYSICAL PROPERTIES AND APPLICATIONS OF NITINOL

by H. U. Schuerch

Prepared by
ASTRO RESEARCH CORPORATION
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strips extending vertically upward or downward. The Nitinol strips nearest the sun will heat up and contract as the transition temperature is reached. The contraction forces the inner race of the casted bearing plate to rotate into a position of minimum spring length for the heated Nitinol strip. The central shaft and lower bearing plate are pinned to the inner race and rotate so that one point on the periphery of the lower base plate always points toward the sun.

A series of tests were conducted on this demonstration model using the setup shown in Figure 27. A 2-kilowatt electric radiant heater provided the heating source for the Nitinol strips. A fan in the base was used to blow cooling air through the louvres on to the strips shielded from the radiant heater. With 0.026 in. diameter Type I Nitinol wires, the pointing accuracy was within 10° for the mode of operation in which the upper end plate was clamped. The rotational speed with the lower base plate clamped was approximately 10 rpm. When the 3-mil ribbons of Nitinol were substituted for the wire, the pointing accuracy was improved, and the speed of rotation doubled. The unit was continuously rotated for 8 hours (approximately 5000 revolutions) without appreciable change in performance.

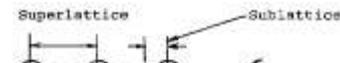
CONCLUSIONS

A wide range of applications for Nitinol materials appears to exist in a variety of structural and mechanical devices. For space systems applications, the potential of directly using environmental thermal energy to actuate required mechanical motions is attractive. Also attractive are the possibilities of designing "flexure-type" mechanisms which do not require bearings.

The material is basically metallic and should exhibit excellent resistance to hard vacuum, temperatures extremes, and radiation.

Further experimental work in characterizing and controlling the thermomechanical properties of Nitinol is required to permit the design and construction of reliable space hardware.

28



La rotation continue avec courbure

COXO 宇森医疗
13年专注于根管治疗设备制造

SC-PRO SC-PRO

SC-Pro出鞘，谁与争锋!

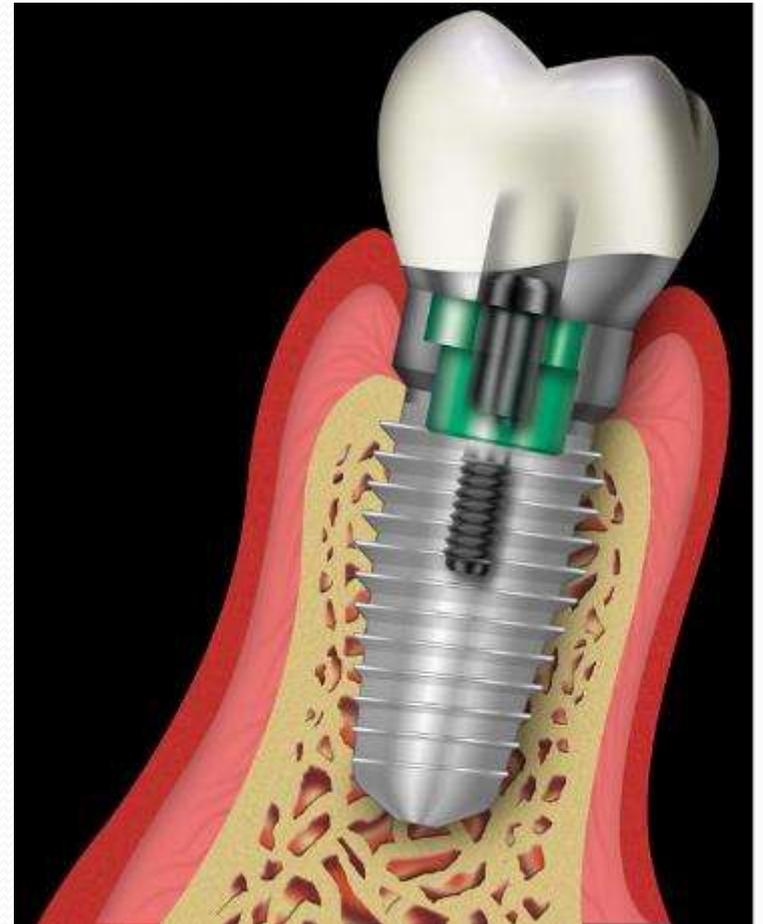


SC-Pro在90° 弯曲钢管下，375rpm连续旋转10分30秒。

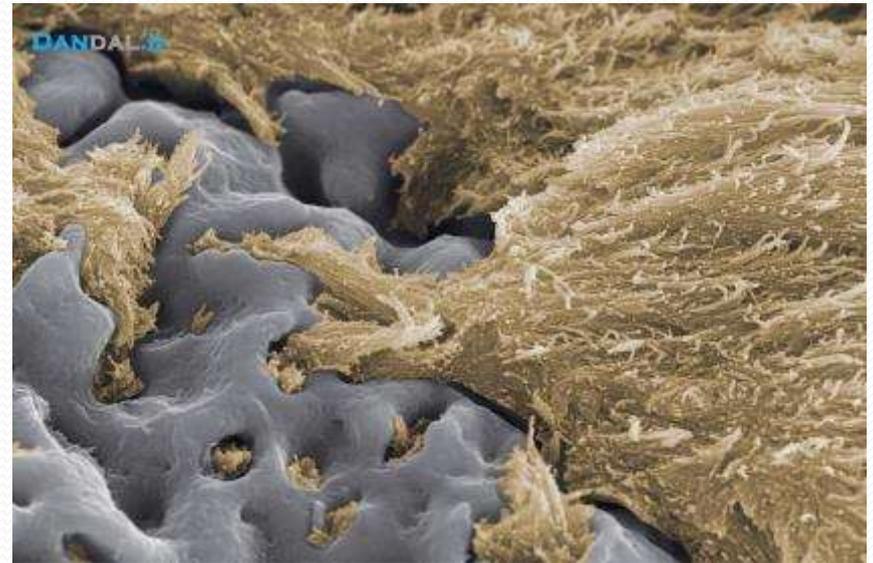
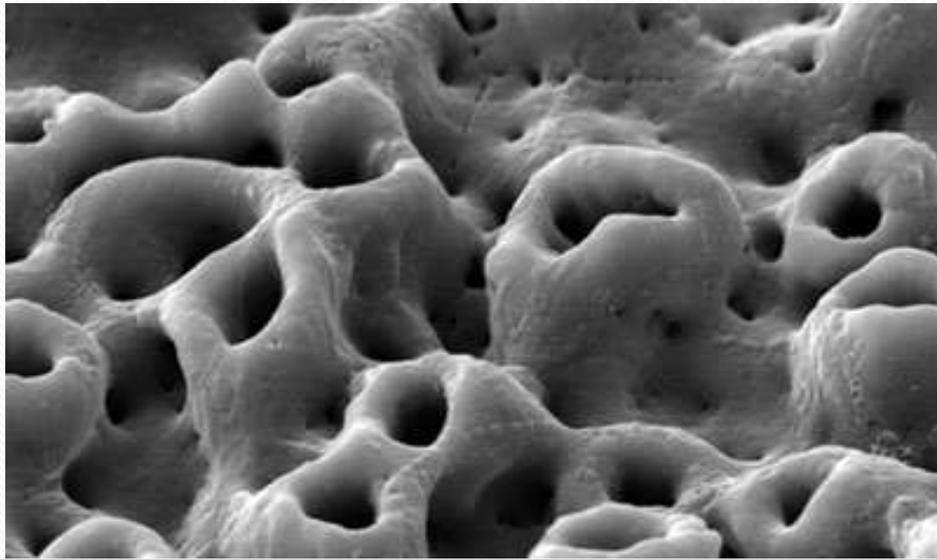
L'implant titane

- Apparue dans les années 50
- Professeur Per Ingvar Brånemark
- Hasard suite à une expérimentation sur le rat.
- Devient le seul dispositif médical « ostéo-intégré ».
- Introduit en dentaire en 1981 par Nobelpharma.
- Taux de réussite 95 % à 15 ans.
- Remplace peu à peu toutes les édentations partielles ou complètes.
- Fabriqué en Savoie (pour le monde entier).

Comment ça marche ?



Qu'est ce que l'ostéo-intégration



Son successeur : le Zircon

- Implant Zircolith de Z-system (Suisse).
- Concept « metalfree ».



Pourquoi ?

- Problème d'allergie et de « péri-implantite ».
- Titane : plus ou moins pur.



1 - Tissu sain



2 - Mucosite : Inflammation des muqueuses

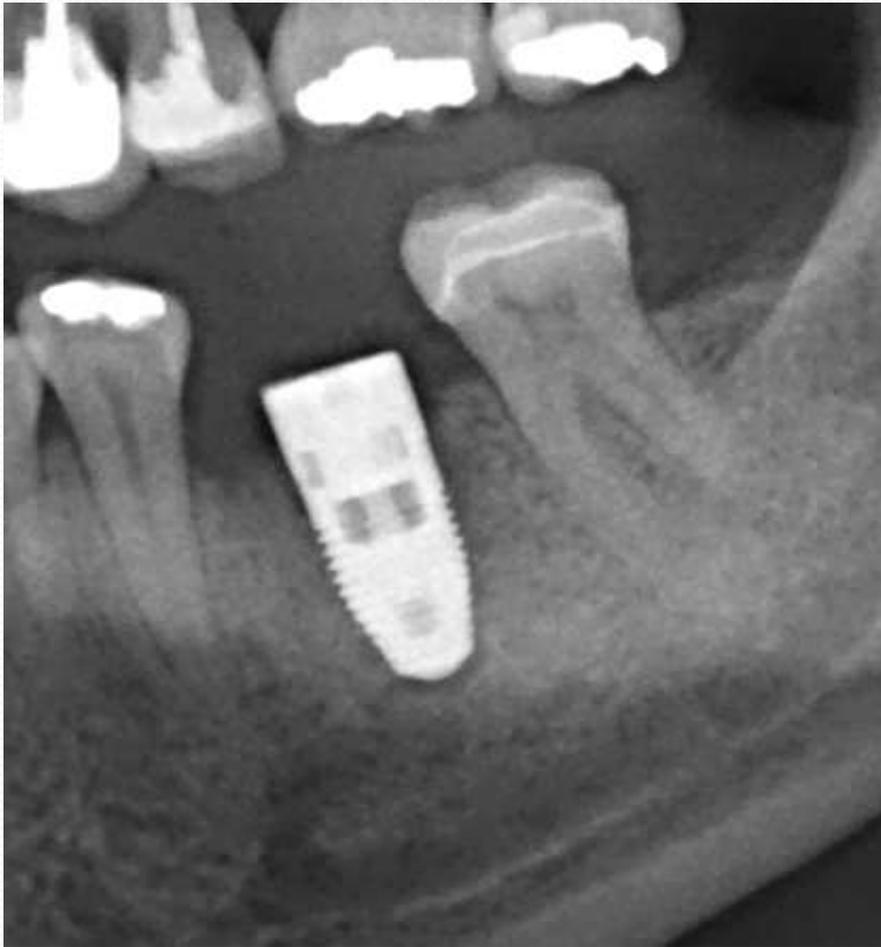


3 - Péri-implantite débutante



4 - Péri-implantite avancée

Radiographies avant -après



Zircon vs Titane

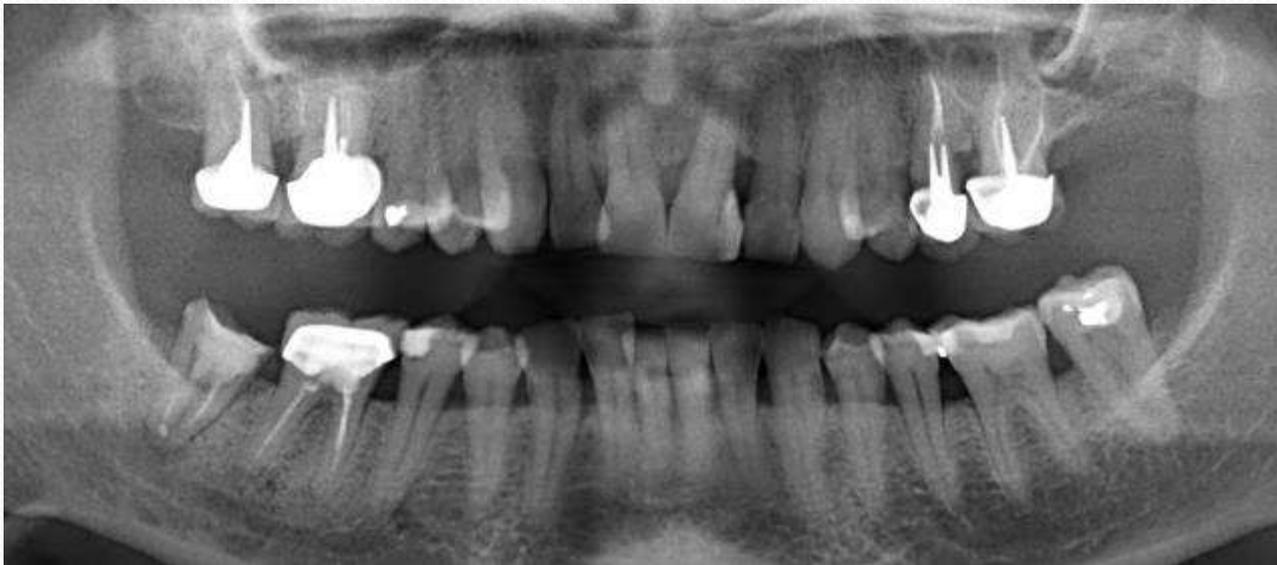
- Absence de péri-implantite si ostéo-intégration.



- Problème : formes et prothèse limitées.
- Recul clinique à 10 ans seulement contre 50.

La radiographie 3D

- Jusqu'alors 2D uniquement.



- Diagnostic peu sûr, pathologie parfois invisible.
- Manque d'information.

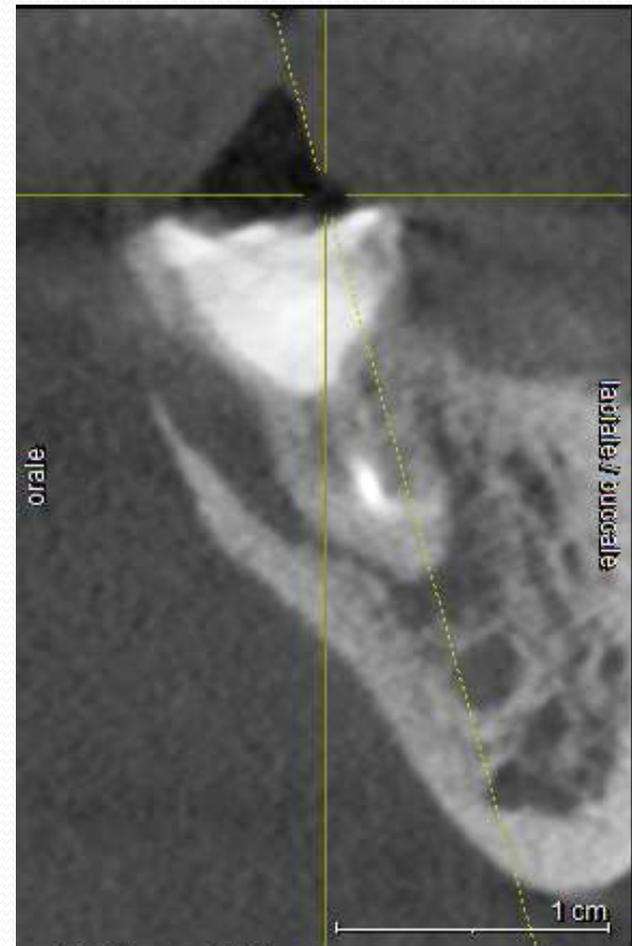
L'appareil d'aujourd'hui



Patiente avec douleur



GALAXIS 20000.JPG 100



GALAXIS 20000.JPG 100

L'informatique et la 3D : Le CEREC

1974 : Pr François DURET
(Lyon)



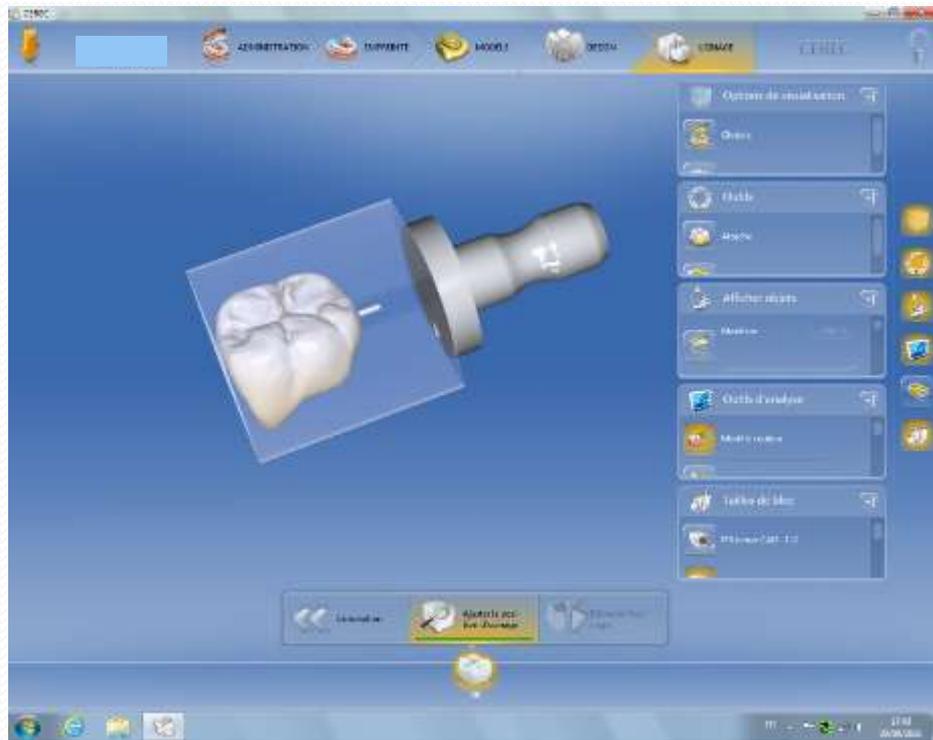
1980 : Pr MÖRMANN et
BRANDESTINI (Zurich)



Empreinte optique et modèle 3D



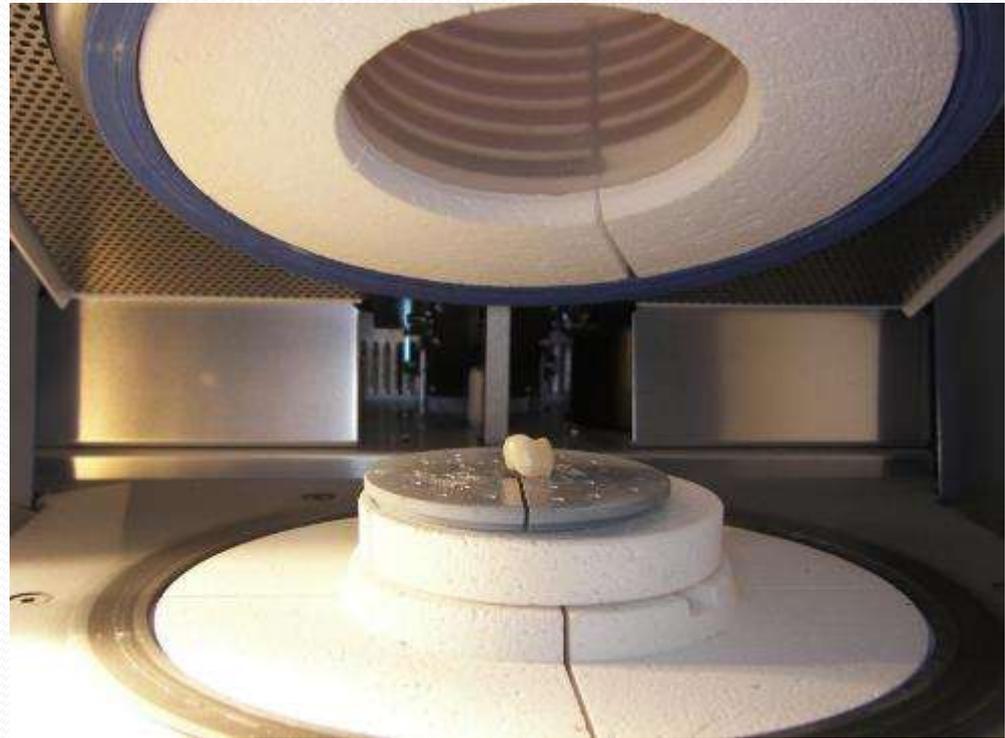
Modèle 3D et bloc céramique



La machine outil



La cuisson



Réalisations tout céramique

