



# IMMEDIATE LOAD OF NANOSTRUCTURED TI IMPLANTS

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## SUMMARY:

### Objectives:

The objective of this paper is the evaluation 3 years experience of a nanostructured CP Grade 4 Titanium dental implants (NANO-Ti implants). Nanostructuring of titanium by SPD processing has made the material with significantly superior mechanical performance when compared to conventional CP Grade 4 titanium. Cytocompatibility studies with fibroblast mice cells L929 indicated that the nanostructured Ti surface has a significantly higher cell colonization, suggesting more rapid osseointegration. The design of a reduced 2.4 mm diameter implant has the strength equivalent to the conventional of 3.5 mm diameter implant.

### Methods:

NANO-Ti implants have been successfully designed, and fabricated. Clinical cases of 250 patients, all receiving immediate load implants, were analyzed during a 3 year follow up period. All NANO-Ti implants were implanted as immediate load implants, the usual success criteria were evaluated.

### Results:

Primary retention of all implants was very good; on the day of surgery all patient received a complete provisional bridge. Healing of the operative wound passed without complications, with subsequent attachment of a definitive metaloceramic bridge completing treatment. Overall success rate of NANO-Ti implants is depending on the implant site. Predominantly the mandible was the indication for NANO-Ti implants.

### Conclusion:

NANO-Ti implants are a good choice in cases of transversal alveolar bone deficiencies.

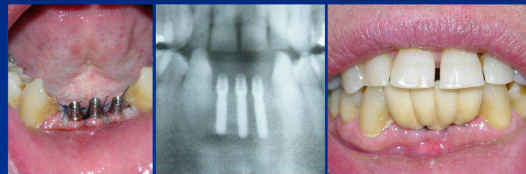


Fig 1. Worlds first clinical application of Nanostructured dental implants - 3 years in function  
Postop view X-ray Clinical view



Fig 2. Application of Nanostructured dental implants - 1 single implant restoration in narrow gaps  
Restoration of missing 51  
Postop view Clinical view X-ray 1 year postop

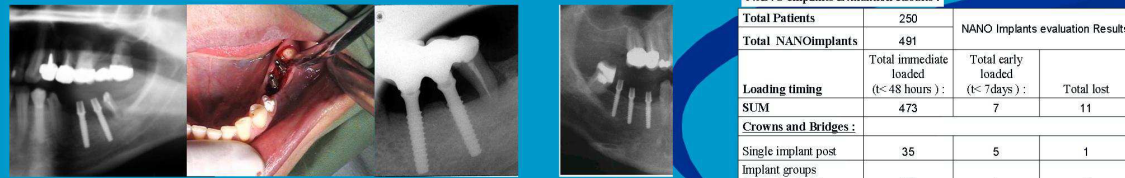


Fig 3. Nanostructured dental implant  
Restoration of missing  
45 in narrow gaps  
X-ray 1 year postop Clinical view



Fig 4. Nanostructured dental implants - 2-5 implant groups restorations in narrow alveolar ridge  
Restoration of missing 36  
Clinical view - implants in alveolar split X-ray 1 year postop

Fig 5. Nano implants  
Restoration of  
missing 46,47

### NANO Implants Evaluation Results:

Total Patients	250	NANO Implants evaluation Results	
Total NANOimplants	491	Total immediate loaded (t<= 48 hours):	Total early loaded (t<= 7days):
Loading timing			Total lost
SUM	473	7	11
<b>Crowns and Bridges:</b>			
Single implant post	35	5	1
Implant groups (2 to 4 implants)	292	2	7
Implant groups (> 5 implants)	136	0	3
Overdentures	10	0	0

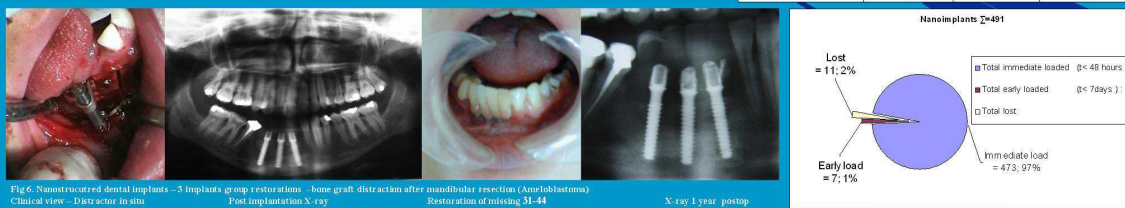


Fig 6. Nanostructured dental implants - 5 implants group restorations - bone graft distraction after mandibular resection (Ameloblastoma). Clinical view - Distractor in situ Post implantation X-ray Restoration of missing 31-44 X-ray 1 year postop

Fig 7. Edentulous mandible prosthetic rehabilitation - Nanostructured dental implants in frontal segment combination with cylindrical dental implants. X-ray after implantation Clinical view - immediate bridge placement X-ray 18 month postop.