Socket Preservation with a Nanocrystalline Hydroxyapatite: Clinical and Histological Outcome with two different Techniques

MILAN, ITALY
8-9 FEB. 2013

SOCIETA' ITALIANA DI IMPLANTOLOGIA OSTEOINTEGRATA SIO

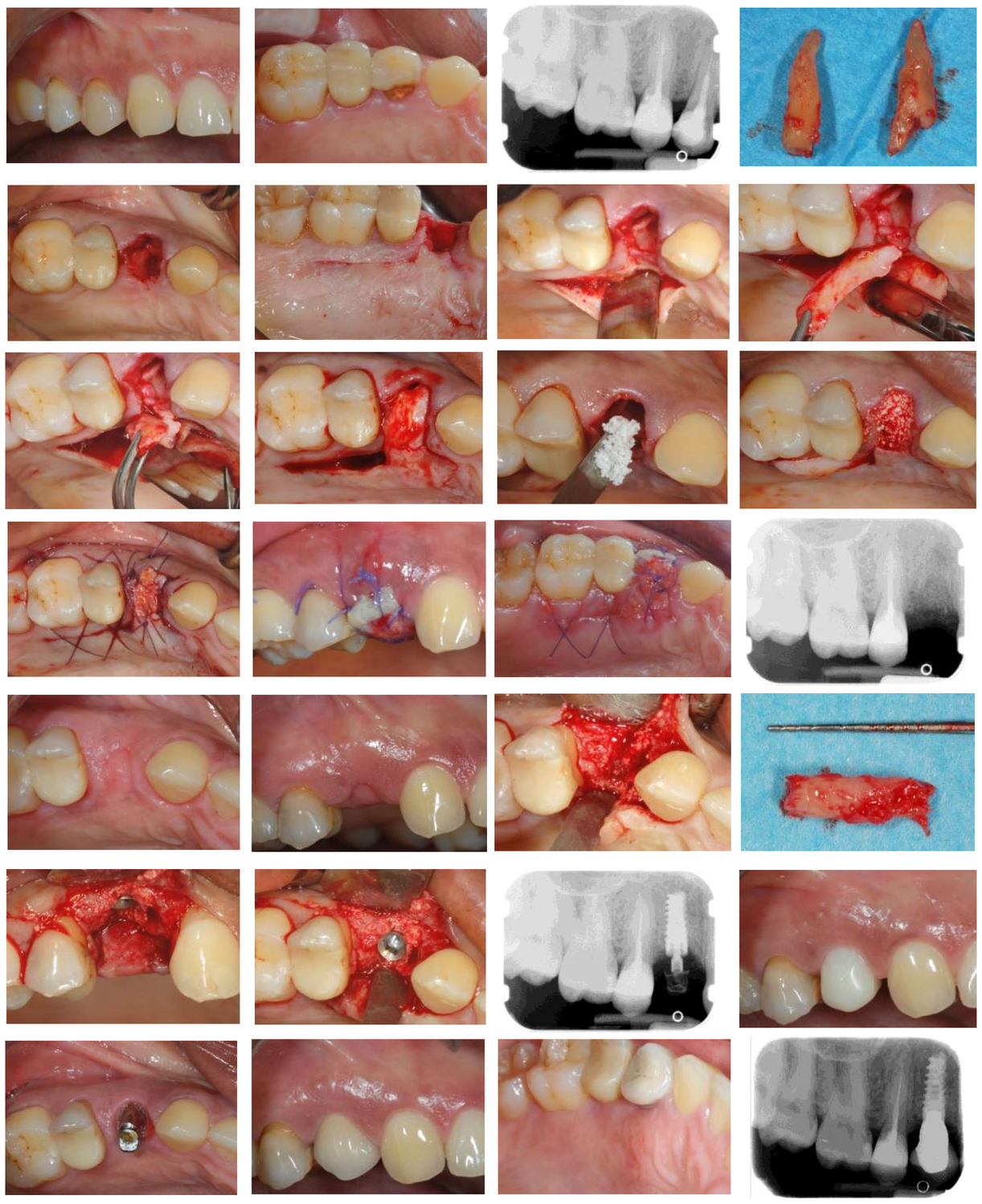
XXI CONGRESS

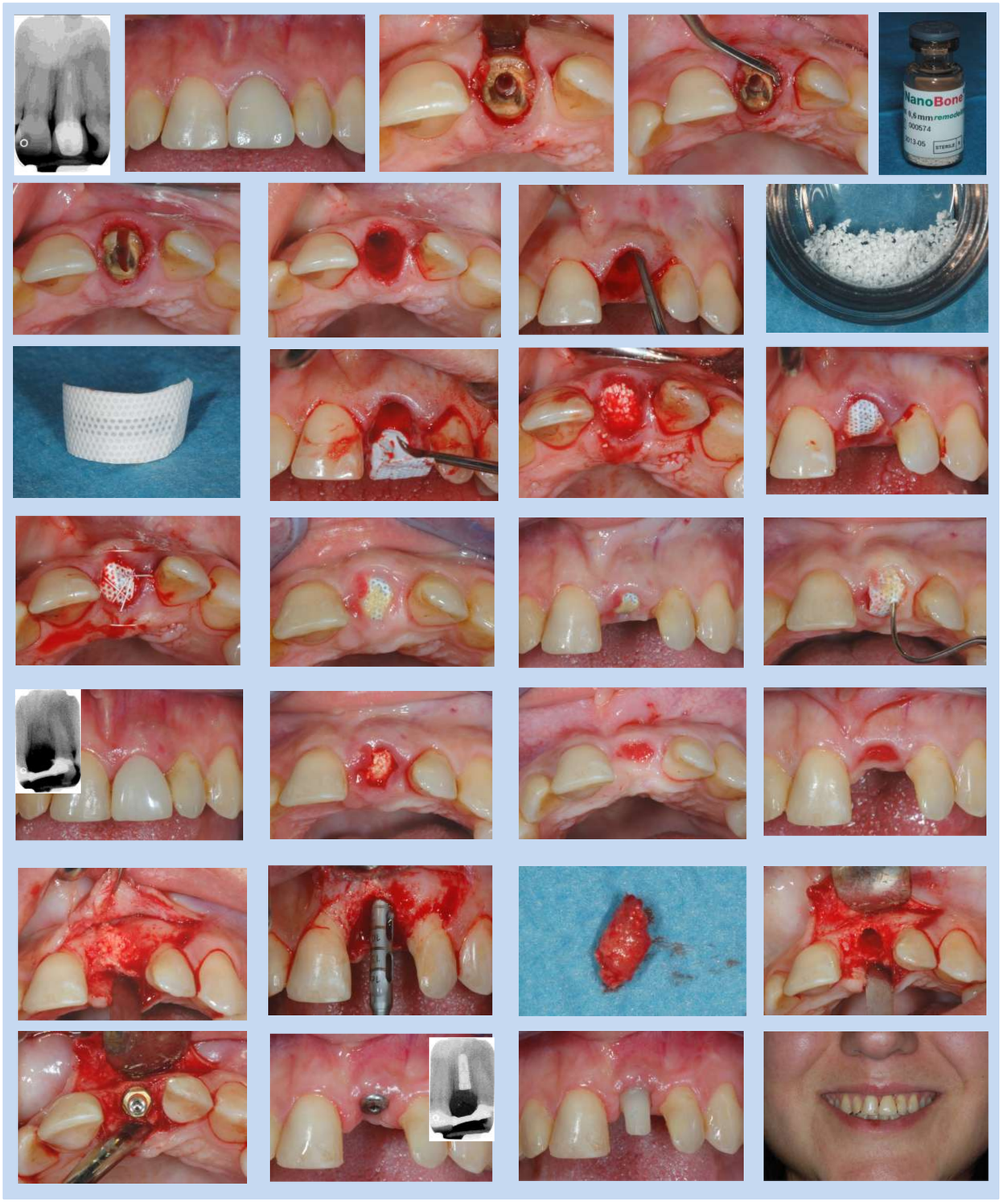
Dr. Fabrizio Belleggia, DDS, Specialist in Oral Surgery
Private Practice, Rome, Italy, fabriziobelleggia@virgilio.it

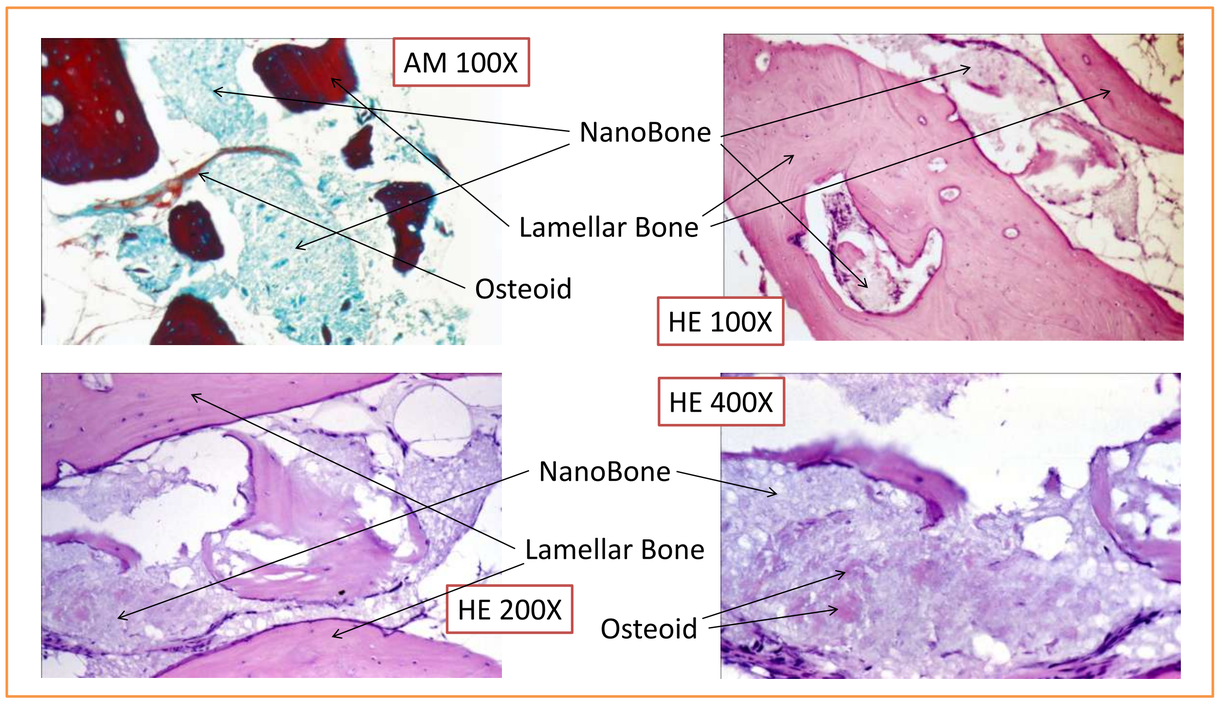
Dr. Gianluca Del Mondo, DDS
Private Practice, Gaeta, Italy, gianluca.delmondo@gmail.com

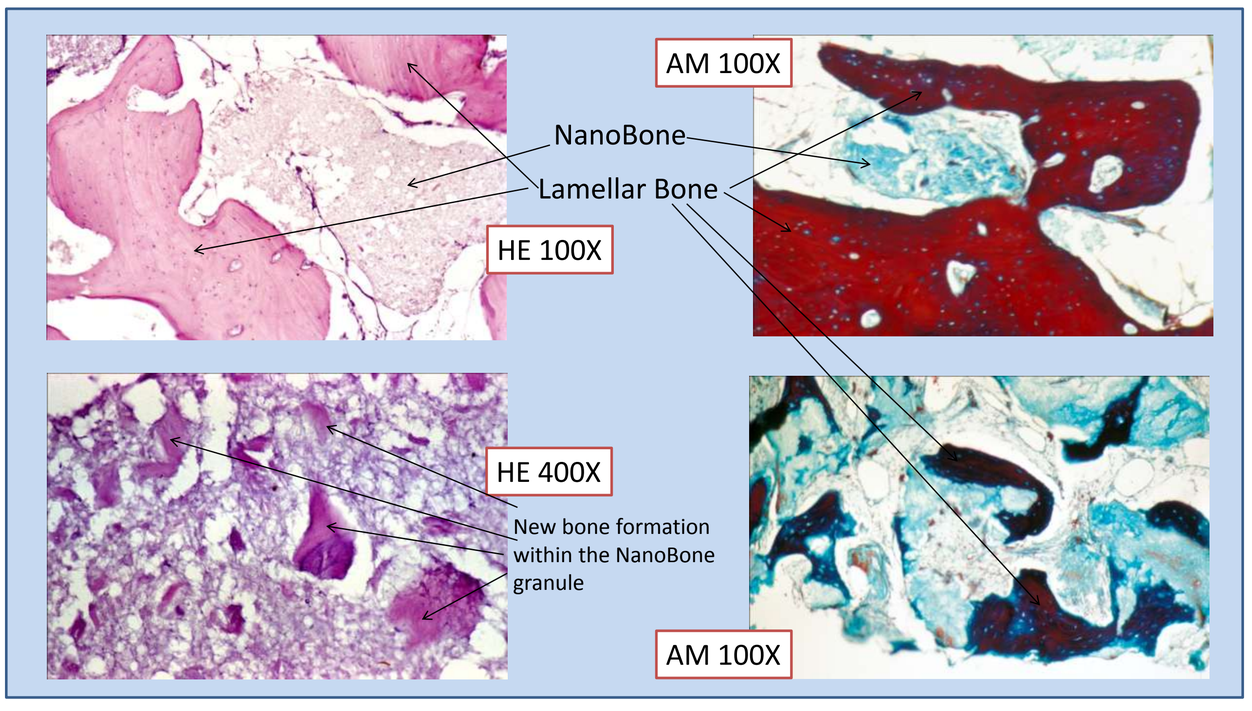
Objectieves: The aim of this study was to evaluate the clinical and histologic outcome of socket preservation procedures using a nanocrystalline hydroxyapatite (NCHA) embedded in a silica gel matrix (Nanobone®, Artoss, Rostock, Germany), covered with two different techniques: the use of a dense polytetrafluoroethylene (d-PTFE) membrane (Cytoplast®, Osteogenics Biomedical, Lubbock, TX, USA), or a palatal pedicle sub-epithelial connective tissue flap (PPSECTF).

Case reports: One maxillary central incisor and one maxillary first premolar were carefully extracted in two patients (2 Females / Age 40 and 37) and the 4-wall extraction sockets were filled with a graft of 100% NCHA 0.6 mm granules covered by a d-PTFE membrane (premolar) or the PPSECTF (incisor). Two provisional fixed adhesive prostheses (Maryland bridge) were applied without pressure on the grafted sites. The d-PTFE membrane was removed 3 weeks after the extraction without flap elevation. After an healing period of 12 and 19 weeks for the premolar and the incisor grafted socket respectively, implants were inserted. During implant bed preparation, a trephine core was obtained for histologic evaluation. The bone biopsies were fixed in buffered formalin, decalcified, embedded in paraffin, cut with a microtome, and stained for light microscopy with hematoxylin-eosin (HE) and azan mallory (AM).









Results: Healing of both socket preservation and implant insertion was uneventful. The NCHA socket filling reduced the alveolar ridge dimensional alterations to 1-1,5 mm. The 2-year clinical and radiographic follow-up from prosthetic loading showed stable tissues. Histologic evaluation revealed the good integration of the biomaterial in the surrounding tissues composed by bone trabeculae and connective tissue. The residual few small particles of the graft were surrounded by vital lamellar newly formed bone either in premolar and incisor site. New bone formation originated not only from the borders of the alveolar walls directed toward the center of the defect, but ossification started even inside the porous amorphous particles. Osteoid protrusions and extensions were seen into NCHA granules. No signs of inflammation or granuloma formation were detected.

Conclusions: Socket preservation using NCHA in combination with either a d-PTFE membrane or a PPSECTF resulted in similar limited horizontal ridge width contraction following tooth extraction, and in the formation of newly formed lamellar bone in a 3-4 month healing time.

Aknowledgements: The Authors would like to thank Mr. Ezio Bassotti, from Catholic University of Rome, for histologic specimen preparation and staining