



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Ospedaliero-Universitaria di Bologna

3D BO²

Second 3D Bologna International Symposium and Workshop

Updates on New Technologies in Maxillofacial Area

S. Orsola-Malpighi University Hospital · Bologna, Italy

March 30th - 31st, 2012

This is to certify that

G.Pertici, G.Carusi, G.Perale

attended the e-POSTER SESSION

“Arturo Beretta”

presenting the e-Poster

**“SMARTBONE: a new composite bone substitute for
reconstructive surgery”**

Held on Saturday, 31st March 2012

S.Orsola-Malpighi University Hospital - Bologna

Head of the Higher Education

Fondazione Alma Mater

Dott.ssa Nadia Borelli



Fondazione Alma Mater

Sede Legale - Via Zamboni, 33 Bologna
Sede Operativa - Via Marconi, 22/24 Bologna

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3DBO²

30th-31st March 2012, S. Orsola University Hospital, Bologna (Italy)
e-poster presentation

SMARTBONE[®]: A NEW COMPOSITE BONE SUBSTITUTE FOR
RECONSTRUCTIVE SURGERY

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Nowadays the loss of bone due to congenital defects, diseases, injuries and trauma, is the most common cause of reconstructive orthopedic surgery; it accounts, just in the maxillo-facial district, hundreds of thousand cases each year worldwide. Furthermore, bone cancers and sarcomas (for example Ewing's disease), even if very often prematurely diagnosed and treated, request relevant bone tissue excise and this kind of operations are critical not only for aesthetical issues but especially for the residual anatomical functionality for the patients

Very often there is a need to fill/rebuild the defect or the eliminated district and, for self-evident reasons, the use of autologous bone is strongly not recommended; moreover if the site involved is quite large, it is very difficult to get the right amount of bone from the patient. Nevertheless, autologous bone graft still plays the role of gold standard in critical sized and non-union bone defects, the main reason being the lack of adequate industrial substitutes (synthetic and xenograft materials). Hence, today's most commonly used solution today still remains the cadaveric bone graft, which is sometimes the only one available. Beside all known critical issues of these grafts (e.g. ethical, availability and costs), the deep washing, deantigenation and sterilization processes make allograft materials very fragile bone substitutes, unable to withstand typical heavy surgical manoeuvres.

Industrie Biomediche Insubri SA (IBI) developed a new technology to improve the properties of natural materials. Indeed, IBI produces Smartbone[®], a bone substitute specifically developed for orthopaedic reconstructive surgery. This innovative scaffold has a composite structure based on a bovine derived bone matrix reinforced with biodegradable polymers and bioactive agents. The bovine derived matrix allows maintaining an adequate 3D-structure, with an open-porosity and a biomimetic chemistry (Ca and P based), biopolymers permit to achieve good mechanical properties (in the range of healthy human cortical bone), while bioactive agents promote cell adhesion, proliferation and high hydrophilicity (essential also for blood absorption and thus sparking chemical signals cascade for regeneration). Smartbone[®] is produced according to GMP (Good Manufacturing Practice) standards, applying only human-use approved components and CE mark is under obtainment for both conventional and unconventional shapes.

Thanks to the very high performances of Smartbone[®], particularly its impressively higher mechanical properties with respect to other bone substitutes, IBI developed and launched custom-made products, "SmartBone[®] on demandTM", solving single specific cases of bone reconstruction: starting from a common CT scan, IBI can provide the adequate substitute for every kind of defect.