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Modulo per Abstract | Abstract Form

Titolo | Title 3D complex Custom-Made Bone Reconstruction with Innovative Biomaterial

Autore/I | Author/s

Enzo Facciuto¹, Carlo Francesco Grottoli², Maurizio Mattarocci¹, Fausto Illiano¹,
Giuseppe Perale^{2,3}, **Gianni Pertici**^{2,3}

Istituzione | Affiliations

1 A.O.R.N Antonio Caldarelli Napoli U.O.S.C. di Chirurgia Maxillo-Facciale (Direttore: Dott. Salvatore Parascandolo)

2 Industrie Biomediche Insubri SA, via Cantonale 67, CH6805 Mezzovico-Vira Switzerland

3 Department of Innovative Technologies, University of Applied Sciences and Arts of Southern Switzerland (SUPSI), Via Cantonale 2C, 6928 Manno, Switzerland

Testo | Text

Grafts for bone reconstruction should ensure both mechanical stability and strength. Moreover, their structure should have an adequate interconnected porosity for cell migration and proliferation, while also providing specific signals for bone regeneration.

A composite solution, based on a novel concept of biomaterial assembly, bearing cues from both mineral components and polymeric ones, was here followed to develop a new three-dimensional bone scaffold. A bovine derived mineral matrix was used to provide adequate three dimensional structure and porosity, while a combination of resorbable polymers were used to reinforce it. Bioactive agent was added to promote cell colonization and proliferation.

Thanks to the very high performances of this material (SmartBone®), particularly its impressively higher mechanical properties with respect to the other bone substitutes, Industrie Biomediche Insubri SA (IBI, Switzerland) developed custom-made products "SmartBone® On Demand™", solving single specific cases of bone reconstruction: starting from CT scan, IBI can provide the adequate substitute for every kind of defects.

Moreover, all data reported in previous scientific papers, indicate that SmartBone is osteoconductive, promotes fast bone regeneration, leading to mature bone formation in about 7 months.

This technology was successfully applied to a custom reconstruction of frontal bone and supraorbital foramen in a 30 years old male.

Twelve customized grafts were designed in order to fill the complex cavity of the defect using a puzzle technique adopting SmartBone® on demand™.

During the surgery each piece were located perfectly inside the gap and fixed strongly adopting small osteosynthesis titanium screws. Surgery was fast and very precise allowing to obtain a very satisfactory results both in terms of anatomical reconstruction and functional. The surgical operation was no longer than two hours and forty-five minutes reducing dramatically the common timing for this kind of surgeries. The post-operative situation is optimal. The TC-scan after 10 months shows an impressive result.

In conclusion, this technique permits a full complete restoration with custom made bone grafts.

Comunicazione orale su:

◇ Caso clinico di particolare interesse