A step ahead in cranioplasty: your unique regenerative solution.
Pure bio-ceramic for a natural aesthetic result

Unique hydroxyapatite biomaterial that acts like bone once implanted

Simplified surgical procedure
Cranioplasty

Today, the reconstruction of large and complex cranial defects is no longer considered simply a matter of the aesthetics. Neurological and psycho-logical side effects must also be taken into account. The outcome of the currently available complex and time-consuming techniques are unsatisfactory, both for the surgeon and the patient. Through use of the most advanced and innovative bio-mimetic ceramic materials, CustomBone Service is the ideal solution for custom-made bone regeneration.

An image is worth a 1000 words, a 3D model is worth a 1000 images
From the CT scan to the custom-made implant

Acquisition and elaboration of the CT scan

CustomBone Service starts from the raw digital data obtained during the CT scan, and through its extensive elaboration, allows for the creation of essential 3D computer reproduction of the patient’s skull.

A detailed protocol providing all the necessary parameters for correct data acquisition is provided through the CustomBone Service.

From the CT scan to the 3D prototype

Only through the raw data elaboration of the CT scan it is possible to design a 3D prototype.
3D prototype: a direct discussion with the surgeon

Together with the surgeon, the 3D prototype is thoroughly reviewed for prospective modifications. This step of CustomBone Service is extremely important to ensure a custom-made implant which provides a superior aesthetic outcome for the patient and a straightforward surgical technique for the surgeon.

Finalisation and application of the custom-made implant

Once the surgeon agree with the design proposed, must sign and sent the design approval document to the manufacturer by email or fax. The final implant is prepared, refined, controlled and sterilized prior to shipment to the hospital for implantation.
In modern medical science, the concept and application of bio-mimetic materials has been consolidated in everyday clinical practice. These bio-mimetic materials are defined as synthetic materials which have the same structural and chemical properties as that of natural tissue.

For CustomBone Service, the research team at Finceramica has transferred this concept into reality through the development of a bio-mimetic ceramic biomaterial based on macro- and microporous hydroxyapatite, a 70% component of human bone.

The particular chemical composition combined with an elevated interconnected porosity plays a decisive role in the osteointegration process by favouring a rapid cell colonisation of the bioceramic and activating the necessary biological stimuli to promote bone regeneration and permit neo-vascularization of the custom implant.

The unique properties of bio-mimetic ceramics

- elevated macro- and micro- porosity
- chemical composition similar to the mineral component of human bone
- rapid colonisation of osteogenic cells and bone deposition
- completely bio-compatible with no risk of viral transmission
- in case of further trauma, behaves like natural bone
- custom-made bio-ceramics permit a simplified surgical procedure
- natural aesthetic result

Limits of other techniques and available materials

**Autologous bone:**
- conservation procedures are complex and present a significant risk of infection
- limited quantities which may not be sufficient for large and complex defects
- donor site morbidity
- frequently reabsorbed (>25% of cases)

**Titanium and acrylic resins:**
- no biological interaction with natural bone
- limited biocompatibility
- collapses in case of further trauma
Patient presented a serious cranial trauma due to a car accident. A bilateral frontal decompression was performed and then, in a second operation, the cranioplasty was performed.

Seventeen-year-old patient presented absorption of the autologous bone graft after a craniotomy. The defect area was removed and placement of the implant was performed in a single operation.

**Indications**

CustomBone Service is indicated for the reconstruction of large and complex cranial defects due to:

- decompressive craniotomy
- fractures caused by trauma
- tumor resection
- absorption of autologous bone graft
- infection or rejection of previously applied material
Tumor resection

Patient was operated for the first time following an osteoma and re-operated due to a relapse. During the 3D model evaluation, a preventive excision was planned and in the final operation, resection and reconstruction was performed in a single surgical procedure.

Previously applied material rejection

Patient was previously operated due to a trauma and reconstruction of the area was performed. An infection occurred and material was resected. Final reconstruction was performed with CustomBone Service.
Science and research are an integral part of the DNA Finceramica. Finceramica’s research activity is finalized in the biomedical progression of today and tomorrow. By pioneering advanced neuroscience therapies, Codman Neuro, a Johnson & Johnson company, has become the leader in the treatment of central nervous system disorders.

Codman Neuro and Finceramica combine their strengths finalised towards the application of innovative and effective therapeutic solutions designed to satisfy the needs of both the surgeon and patient. Finceramica has specialised in the development and technology of bio-ceramic materials, while paying particular attention towards the creation of Custom-Made solutions. With the aim to maintain a constant information exchange with the leading neurosurgeons, Finceramica has relied on the professionalism and organization of Codman Neuro.

The Finceramica-Codman Neuro team works in complete synergy to provide the surgeon with state-of-the-art technical support during the entire process of the CustomBone Service.