

# Clinical Perspective on the Biomaterials used to Repair the Cranial Defects

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## Abstract.

The loss of cranial bone integrity due to a trauma or injury of the head is a contemporary example of tissue failure, which usually requires the permanent or temporary implantation of a bone substituent and may become challenging in case of large defects [1]. Cranioplasty represents the surgical procedure to repair a defect of the skull bone [2].

The aim of this study is to report and compare between the using of polymethylmethacrylate (PMMA) and titanium mesh implants in post-traumatic cranial defects.

In our study we had 22 patients, 12 males (54.55%) and 8 females (45.45%), aged between 21 and 64 years, median age 42.5 years. All the patients underwent elective delayed cranioplasty surgery to achieve morphological and functional rehabilitation of the cranial vault performed during the period from 1<sup>st</sup> January 2014 to 31<sup>st</sup> December 2016. Pre- and postoperative clinical and radiological (3D-Computed Tomography-CTscan) outcomes were performed.

Both PMMA and Titanium mesh were used. Prefabricated PMMA implants were effective for cranioplasty, reducing surgical time, reducing surgical blood loss and technical simplicity. The advantages of the titanium mesh are that it is malleable, biocompatible and thin. Another advantage of titanium mesh is its nonferromagnetic capacity which permits the safe examination in magnetic resonance imaging high field, useful for long-term follow-up. There were no infected implants and none of the patients required a second surgery.

The use of titanium mesh for cranioplasty is a good alternative in spite of the disadvantages, causing an artifact on CTscan and magnetic resonance imaging (MRI), and it's expensiveness. Prefabricated PMMA implants are effective for cranioplasty in order to reduced surgical time, reduced surgical blood loss and technical simplicity.

## References

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