

Jaime Planas, Arturo Carbonell and Jordi Planas  
Barcelona, Spain

## INTRODUCTION

Since ancient times different materials have been recommended for closing skull defects. Silver, aluminum, and gold tarnish and corrode body tissues. Stainless steel and vitalium are well accepted but require two surgical steps, as a mould of the necked defect has to be taken before fixation of the plate to the defect. Tantalum can be molded and fitted in one stage, but as other metals it is opaque to X-rays. This prevents further explorations.

To overcome these disadvantages Gurdjian and Brown described in 1943 [1] the use of plates of methyl methacrylate.

## MATERIAL AND METHODS

During the last 30 yr, the senior surgeon has performed 31 posttraumatic cranioplasties. The first three of them were covered with tantalum plates. Due to the impossibility to perform postoperative X-ray explorations, plates of methyl methacrylate were used in the last 28 cases.

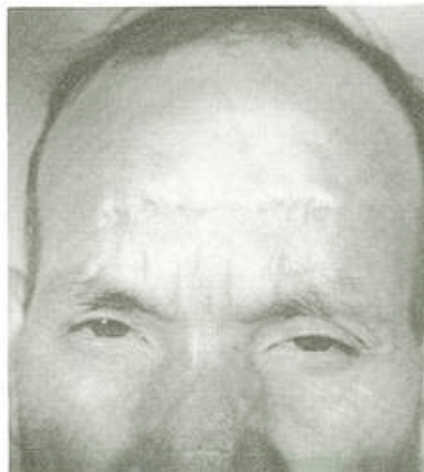
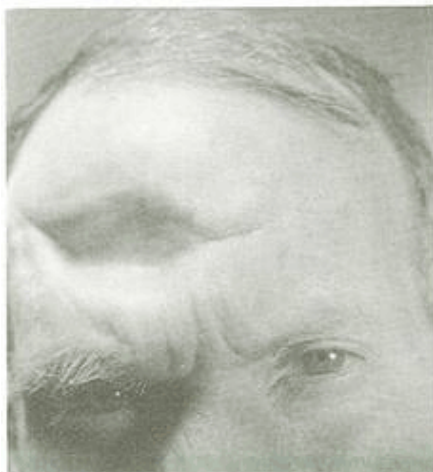
General anesthesia was used in all cases. The skull has been exposed in most of the cases through the old scalp usually situated over the defect.

Methyl methacrylate is a material easy to find in the market, transparent to X-rays, economical and easily molded over a flame of a Bunsen burner.

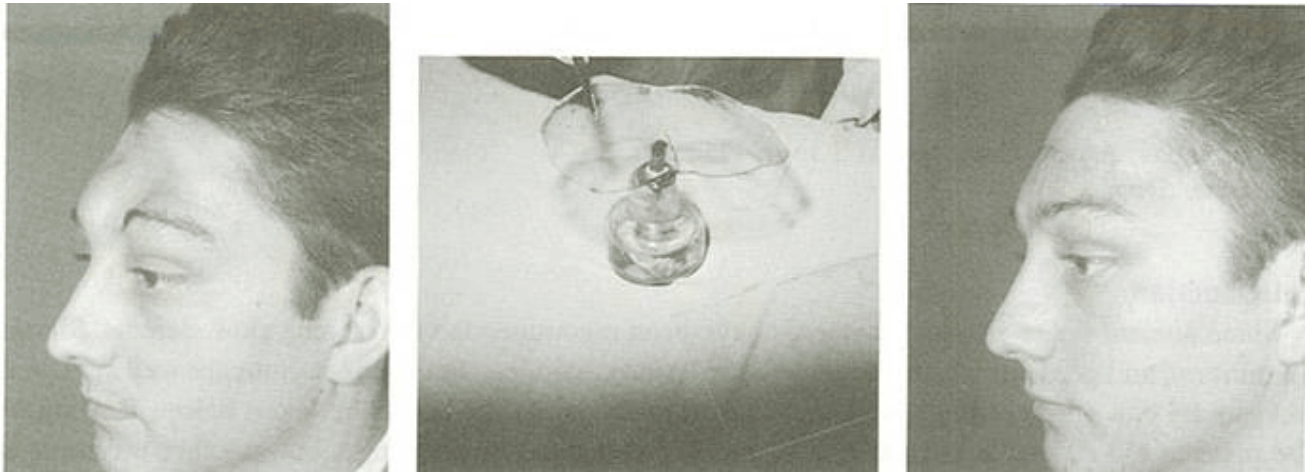
We recommend the use of methyl methacrylate plates of 1 1/2 or 2 mm thickness. The plate is curved and cut when softened over a flame of a Bunsen burner. The plate is fixed to the skull by stainless steel wires. The holes in the plate are easily made using a very hot straight needle. Drains were used only in one case.

## RESULTS

Results in all of the 31 cranioplasties have been always good with no morbidity. The only case where a suction drain was used was in a very difficult case in which the duramater was torn off in several places, some cerebrospinal fluid was aspirated by the suction drainage, and it was immediately retired and a pressure dressing applied. No further consequences derived from this. In two other cases a hematoma was aspirated, also with no consequences. A pressure dressing was applied and antibiotic prophylaxis was established in all cases.



*Fig. 1.*



*Fig. 2.*

## **COMMENTS**

Our experience has shown that any size of defect can be covered with acrylic plates. The potential space (dead space) between the plate and the meninges has not given problems in any of the cases, being in some cases several centimeters. Probably the cephalic mass is expanded or the cavity filled with fibrous tissues, as the human body does not accept empty spaces.

## **REFERENCES**

1. Gurjian ES and Brown JC (1943) Impression technique for reconstruction of large skull defects. *Surgery* 876.
2. Rubin LR (1983) *Biomaterials in reconstructive surgery*. C.V. Mosby Co., St. Louis.



