Temporary Covering for Craniotomy Site

When a craniotomy that involves the removal of a large portion of bone in an infected area of the skull is performed, a permanent acrylic plate to cover the site cannot be implanted until the absence of infection is certain, possibly for as long as six months to one year. During this period, the fact that the usual bony protection is removed from a section of the brain poses a risk to the patient.

In the case of a 20-year-old female victim of an automobile accident, the risk seemed great enough to warrant the use of some type of protective head covering. The skull and brain injury required a left temporofronto-parietal craniotomy, with the removal of approximately 9 x 6-cm portion of the skull. The brain injury produced a right hemiplegia, aphasia, and ideational apraxia. The patient had 50 percent auditory comprehension for one-stage commands. Expressive ability was limited to a few gestures and emphatic show of affect. A right hemianopsia was present. Her performance IQ was 86. Physical restoration allowed the patient to be ambulatory, using a cane and an ankle-foot orthosis.

This patient, premorbidly, had been very athletic. After the injury, she quickly regained her strength and energy, and was intent on resuming many previous activities. The combination of the patient's high level of activity, her multiple deficits, and the need to wait one year before implantation of a permanent plate resulted in the decision to provide temporary protection over the skull defect.

Initially, the patient was offered a protective helmet, which she refused for cosmetic reasons. She did, however, agree to wear a wig with an Orthoplast plate fixed inside.

Method
An irregular, oval-shaped piece was cut from 5 mm of Orthoplast plastic and molded over a styrofoam wig head. The edges of the plate were cut to extend 3.5 mm beyond the margin of the opening in the patient's skull. All angular corners were rounded so that, if the plate should be dislodged by a blow, no part of it could penetrate into the soft tissue below. A synthetic, expandable wig, marked to indicate the intended location of the plate, was stretched over the patient's head. Then the wig was removed with care to maintain it in a stretch condition, and loop Velcro was hand sewn into the marked area. Matching adhesive hook Velcro was attached to the outside of the Orthoplast plate. The plate was then fixed to the inside of the wig (Figure 1). Fabrication took about five hours. A second wig was also modified; this one allowed the plate to be detached from one wig and placed into another, while the first was cleaned and set. The first wig required professional cleaning and setting; the second could be shampooed and styled at home.

Results
Cosmetically, the patient was pleased with the wig, which covered not only her shaven head but also the gross defect in the contour of her skull. She conscientiously wore it during waking hours for one year. She swam, went on hikes, participated in games of modified basketball, bowling, badminton, and rode a three-wheeled bicycle, all without incident.

Discussion
This approach to the problems of protection and cosmesis for the patient awaiting implantation of a permanent acrylic plate should be considered when a recommendation for wearing a protective helmet has been rejected. Other plastics could also be used, such as Polypropylene, which affords better protection against a sharp and penetrating type of blow than Orthoplast does. However, Polypropylene would be more difficult to work with than Orthoplast.

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Figure 1 Schematic diagram of frontal section through Orthoplast plate, wig, and skull