A NEW METHOD FOR APPLYING POLYETHYLENE FILM TO THE SKULL IN THE TREATMENT OF CRANIOSYNOSTOSIS

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The use of polyethylene film to retard the regrowth of bone following craniectomy for craniosynostosis has been established as an important feature in operative technique. The technical problem of fixing the film in position has been managed formerly by punching holes along the margins of the bony defect and sewing the plastic in place with silk sutures. This part of the procedure frequently accounts for a significant portion of the operative time. The duration of the operation is a matter of importance in the small infants who are usually the subjects for craniectomy. For this reason it has been considered advisable to develop a more rapid and convenient method for the application of polyethylene film to the margins of the skull. This consists of stapling the plastic over the edge of the bone with specially designed tantalum clips.

TECHNIQUE

A clip applicator* has been made, which has a powerful action of the jaws, that works at a right angle to the shaft of the instrument (Fig. 1). The head of the applicator is small enough to be introduced easily into a craniectomy defect of 8 mm. The lower jaw has a thickness of 2.5 mm., thereby preventing undue stripping of the dura mater from the skull during the application of the clip. The jaws open to a maximum width of 7 mm. thus permitting its use even in older infants. The open width of the jaws can be regulated by means of a thumb-screw in the handle, allowing the clip to be held tightly in place while passing the instrument (Fig. 2).

Fig. 1. Clip applicator. The knurled screw on the handle can be adjusted to fix the open width of the jaws.

* Available through Codman & Shurtleff, 104 Brookline Ave., Boston, Mass.
FIG. 2 (left). The clip may be held in the applicator while the instrument is being passed. The lower side of the clip is placed flat against the jaw of the applicator for greater stability.

FIG. 3 (right). The clips are cut out of 2 mm. strips of 0.015" tantalum. This size is easily cut with small wire cutters.

FIG. 4. Coronal craniectomy showing the polyethylene film applied to the edges of the bone by means of the tantalum clips.

The clips are made from tantalum which is 0.015" thick. They can be fashioned by having a sheet of the metal cut into strips 2 mm. in width. These strips can then be cut by the nurse prior to operation to make clips of the desired size. We have found that the most satisfactory design is to have the clip pointed at only one end. The pointed end is used to penetrate the outer table of the skull and hold the clip securely in place. The straight side lies flush with the inner table of the skull and does not depress the dura mater.
The clip is made from a 12-mm. length of the tantalum strip with the point beveled 1 mm. from the end. Regular wire cutters can be used to cut the metal. The point is then bent at a right angle to the strip and a second bend is made in the middle of the clip (Fig. 3). This may be modified depending on the thickness of the bone. It has been found that such a clip is about the right size for children under 1 year of age (skull less than 4 mm. thick). It will hold very well in the infant skull and the strength of the tantalum is such that the shape of the applied clip is maintained.

By using this method we have found it to be easier and faster to apply polyethylene film in these patients. The film is held smoothly and firmly in place and the operative time is significantly diminished (Fig. 4). Up to the present time 33 patients have been treated by this technique. There have been no complications incident to the use of this method and the development of the head following operation has been satisfactory in all cases.

REFERENCES