Control of bone bleeding during Cloward procedure

Technical note

SETTI S. RENGAChary, M.D., AND Ali B. MANGuOGLu, M.D.

Department of Neurosurgery, Kansas University College of Health Sciences and Medical Center, Kansas City, Kansas, and the Veterans Administration Medical Center, Kansas City, Missouri

A simple and effective technique is described for the control of bone bleeding during the Cloward procedure for anterior cervical interbody fusion.

KEY WORDS • cervical fusion • Gelfoam • thrombin

THE anterior cervical interbody fusion operation, as described by Cloward, is extensively employed in the management of cervical spondylosis and other disorders. In this operation, during the drilling of the intervertebral space and adjacent vertebrae, one encounters bleeding from the cancellous bone. The rate of bleeding is variable, depending upon the vascularity of the bone and the venous pressure. It ranges from a minimal capillary ooze to arterial bleeding from the nutrient artery to the vertebral body. Most often one encounters diffuse brisk venous bleeding from the cancellous bone. To control this bleeding, bone wax is not used because of the possibility of its interfering with bone fusion. Usually the drill hole is packed with Gelfoam soaked in a thrombin solution which is made up at an approximate concentration of 100 unit/ml. Although this method has been satisfactory in many cases, we have found a modification using dry compressed Gelfoam combined with thrombin powder to be far more efficacious. The technique to be described stops the bone bleeding quickly, predictably, and very effectively.

Technique

After the drilling is started, if brisk bleeding is noted, a 4-sq cm area is cut out of a dry compressed Gelfoam sheet, and approximately 250 units of dry thrombin powder is placed in the center (Fig. 1a). More thrombin powder may be used if the bleeding is very brisk. The Gelfoam sheet is folded over twice (Fig. 1b) and impacted into the drill hole using a Russian forceps. The area of Gelfoam is, by design, larger than that of the bottom of the hole, such that it lines the sides as well as the bottom of the drill hole (Fig. 1c). The Cloward drill is used in the usual manner.

Fig. 1. Technique for hemostasis. For a description, see text.
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During the drilling process, the Gelfoam forms a pulp and is forced into the meshes of the cancellous bone. At the completion of drilling, excess Gelfoam pulp is removed with suction, but irrigation with saline is avoided. The process is repeated as necessary, until dense cortical bone is encountered.

This method appears to be effective for two apparent reasons: the pores of the cancellous bone are mechanically plugged with Gelfoam pulp, and a highly effective concentration of topical thrombin is made available at the bleeding site.

We have used this technique in a series of 10 cases during the past year. Bone bleeding was satisfactorily controlled in each instance. There has been no postoperative wound infection. Follow-up radiological examinations have shown satisfactory bone fusion.

Reference


Address reprint requests to: Setti S. Rengachary, M.D., Section of Neurosurgery (112), Veterans Administration Medical Center, 4801 Linwood Boulevard, Kansas City, Missouri 64128.