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VIEWPOINT

The Trendelenburg Test: Simple Method to Avoid Wound Healing Complications after Cranioplasty

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Sir,

The syndrome of the trephined is a disorder of transient neurological deterioration that can occur in patients with a large calvarial defect. The symptoms range from seizures, headache, neuropsychiatric disturbance, focal weakness, midbrain syndromes, and Parkinsonian symptoms.[1] Following cranioplasty, there is increased cerebral metabolism, cerebrospinal fluid (CSF) pressure normalization, and improvement in cerebral hemodynamics, which lead to reversal of the neurological symptoms.[1] Nakamura first noted prompt reversal of speech worsening and right hemiparesis after moving the patient to a horizontal or Trendelenburg position, along with restoration of the curvature of the scalp flap.[2]

Therefore, cranioplasty reconstruction is of the utmost importance in patients with the syndrome of the trephined. Postcraniectomy defects, related to intracranial bleeding or infection, often require composite reconstruction of the calvarium, skin, and soft tissues.[3] During preoperative examination, it is often difficult to determine if there is an accompanying skin defect. The scalp is sunken and may not easily re-expand to the preexisting contour and surface area to accommodate a cranioplasty implant. Currently, there is no standard for determining whether the trephined patient will benefit from collaborative plastic surgery involvement.

Herein we present a simple method of evaluating patients with large postcraniectomy defects preoperatively to aide in planning the reconstruction. In the preoperative evaluation, we place the patient in a flat supine position on the exam table to measure the scalp elasticity and ability for the brain to re-expand. The patient first sits upright, which clearly delineates the calvarial defect (Fig. 1). Next, the patient is brought into a flat supine position (Fig. 2) to demonstrate the distensibility of the scalp skin and soft tissue from the increased intracranial pressure. The amount of expansion obtained with the position change can be used to approximate how much expansion will be gained after recreating the defect in the operating room.

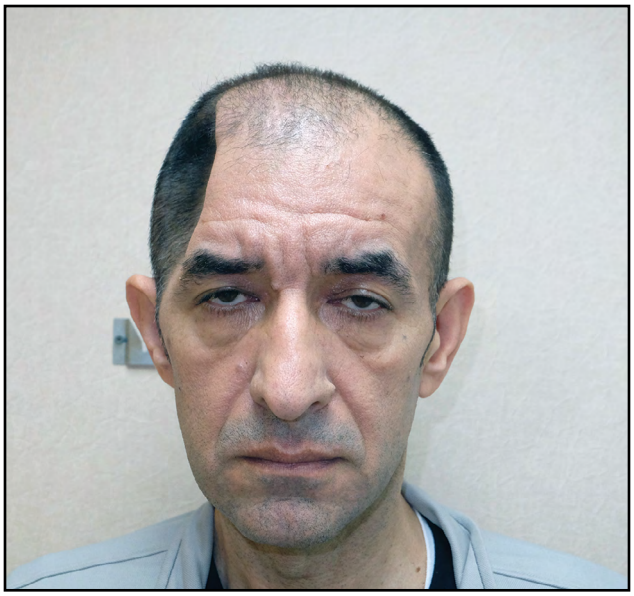

Fig. 1. Patient upright.

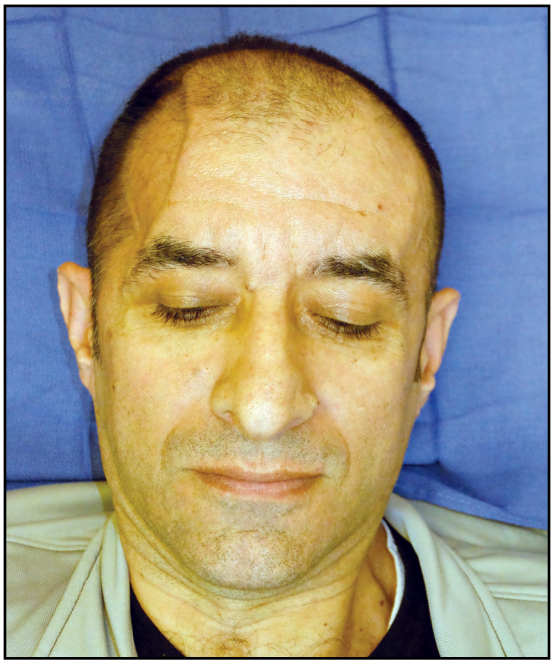

Fig. 2. Patient supine demonstrating scalp distensibility.

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This knowledge can be used preoperatively to guide reconstruction planning and patient expectations. Patients are simply kept in a flat supine position. We prefer the eponym Trendelenburg to reference how this positional change can momentarily improve neurocognition in addition to help with preoperative planning. In our experience, patients that "fail" this test are those whose scalp remains tight and convex, which can represent inelastic soft tissues or adherent dura and brain with little capacity to restore intracranial volume. Our recommendation for the former is the use of a vascularized flap, whether free tissue or locally based, to offset tension on the final scalp closure. Cases with adherent dura require staged reconstruction with free tissue transfer and delayed cranioplasty.[3,4]

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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