Emergency Department Skull Trephination for Management of Acute Epidural Hematoma

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INTRODUCTION/BACKGROUND

Skull trephination for the management of acute epidural hematoma is an incredibly uncommon occurrence for emergency medicine (EM) physicians. As a result, EM providers are likely unfamiliar with its contraindications, the necessary supplies, and the steps involved. In settings without neurosurgical backup and with a patient showing signs of cerebral herniation, it can be lifesaving. Currently, procedural training models for this procedure are expensive and unrealistic for most EM programs to obtain.

EDUCATIONAL OBJECTIVE

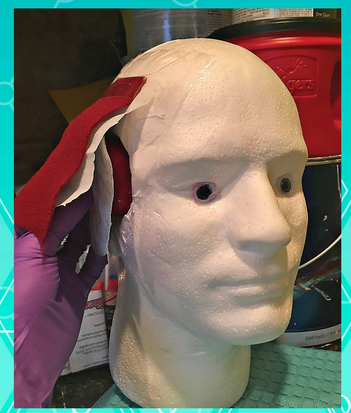
To create a low-cost, realistic task trainer for procedural education of skull trephination and incorporate its use into an EM residency simulation curriculum. The model will be used with a simulation case of a patient presenting to a rural ED with an epidural hematoma and subsequent decompensation. This will allow residents to learn the contraindications and perform the procedure, despite its limited use in our practice, as they may one day practice in an area without many resources.

CURRICULAR DESIGN

A cavity was carved into the temporal region of a Styrofoam head. This cavity was lined with a piece of white plastic tablecloth to represent the dura. A hematoma was created by placing a red-colored water balloon inside the cavity. The skull flap was recreated using cured white modeling epoxy. Another piece of tablecloth was placed on top of the bone to represent the periosteum. Red felt was used as the temporalis muscle. A bald cap was then placed on top of the entire head. “Googly eyes” demonstrating anisocoria, with a dilated pupil on the side of the hematoma, were placed on the head. Residents were tasked with managing a case of an epidural hematoma in a rural ED without neurosurgical backup. The patient developed signs of herniation despite aggressive medical management and required emergent skull trephination prior to transfer to a tertiary care facility.

IMPACT/EFFECTIVENESS

Previously, our program provided no exposure to this rare, critical procedure. Presenting the model in the context of a simulation case allowed our learners to critically consider the indications of the procedure. For an initial cost of less than $12 to construct, our device provided a realistic tool for bedside skull trephination that our residents found surprisingly immersive. As some of the model’s parts are reusable, each additional use after the first cost only $2.50.



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