

Abstract #1408.docx

HALO FIXATION IN CHILDREN: ANATOMICAL CONSIDERATIONS AND THICKNESS AT THE PIN INSERTION SITE

Introduction/ Aim

The halo skeletal fixator provides immobilization that stabilizes the cervical spine, and can correct with traction spinal deformities. Sometimes the pin penetrates bone of the skull and enters the intracranial space, resulting in potential complications. There is lack of relevant literature concerning pin insertion considerations in children. The aim of this study is to evaluate the thickness of the skull to use the halo fixation safely.

Materials and Methods

A CT scan evaluation of skull thickness in 270 children from 0 to 16 years old (y/o) stratified by age, 15 children each year of age, only 0 y/o divided into less and more than half year. All cases were attended in the emergency by accident, head CT scan performed, fractures and concomitant head or bone diseases were excluded. The thickness of the skull at the pin insertion sites (right and left anterolateral, right and left posterolateral), anterior and posterior and lateral of the vault of each case were measured.

Results

Both anterolateral and posterolateral skull thickness at the pin insertion site increase with age and they reach 2.5mm by 1 y/o and 3mm by 5 y/o. Anterolateral and posterolateral thickness finally reach 4mm and 5mm respectively by 16 y/o. They are bigger in boys than girls at all ages. Lateral skull is thinner than all other points ($p < 0.01$).

Discussion

Halo skeletal fixation is widespread to both adults and pediatric populations, and it is sometimes applied to the children, even if they are less than 3 y/o. In this study, some cases less than 3 y/o had the thickness only less than 2mm. The tapered tip of the pin is usually more than 2mm, thus care must be taken when used. CT scans are recommended before applying to the patients especially less than 3 y/o.

Conclusion

Care must be taken when pin length is selected in young children. Special pins should be used according to the skull thickness at each age, in order to avoid complications. This study helps to choose the length of the point that should be ideally used in children when halo is applied.