



## Exuberant Growth at the Anterior Fontanel Following Sagittal Synostosis Surgery

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### Introduction

Craniosynostosis of the sagittal suture can be treated with either open calvarial vault procedures, or with an endoscopic/minimally invasive procedure. When the less invasive procedure is performed, there are two methods for accessing the epidural space: dissection of the anterior fontanel, or burr hole craniostomy.

### Methods

An IRB-approved retrospective review of patients who underwent minimally invasive sagittal synostosis surgery between 2009 and 2012 revealed 179 patients. The surgical team had employed the anterior fontanel approach from April 2009 to May 2011. The same surgeons switched to a burr hole approach in May 2011. Clinic notes and photographs were reviewed to assess for the development of the “volcano sign” in which boney overgrowth is noted at the site of the anterior fontanel.

### Results

In 6 patients, the fontanel was dissected (AF group);, 11 underwent burr holes (BH group) to access the epidural space. Mean follow up was 27 months for the AF group and 19 months for BH group. Four of the 6 AF patients (67%) developed the volcano hump in comparison to 2 of the BH group (18%) ( $p=0.109$ ) this was significant to  $p=0.017$  with a z-score of 2.213. Cephalic index at last follow up was not significantly different (77.8% vs. 75.3%,  $p=0.360$ ). There was no significant difference in occipital-frontal circumference percentile (72% vs. 83%,  $p=0.947$ ). Although no invasive pressure monitoring was carried out, there were no other signs of increased intracranial pressure.

### Conclusions

It appears that the method used initially by this team to dissect the anterior fontanel trended toward resulted in a higher incidence of excessive boney growth at the site of the anterior fontanel. This result trended toward but did not reach statistical significance in our small sample. As a result of this observation, the our team now routinely uses the burr hole approach to access the epidural space. Although this finding has been correlated with increased intracranial pressure in other reports, we do not see signs of that in this cohort. This finding implies a role for dural signaling in the development of bone at suture sites.

### Learning Objectives

Understand options for treatment of sagittal synostosis.

Discuss potential implications of dural manipulation.

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