Neosuture Formation after Endoscopic-Assisted Craniosynostosis Repair

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Background: Continued fusion and synostosis of unaffected sutures has been noted after both traditional calvarial vault remodeling and endoscopic-assisted synostosis repair.\(^1,^2\) Agrawal and colleagues identified reformation of the sagittal suture after strip craniectomy in 17% of their cases.\(^3\) In our experience, we have not observed a neosuture in patients after open calvarial vault reconstruction; however its presence has been recognized after endoscopic-assisted strip craniectomy and moulding helmet therapy. We aim to identify the rate of a neosuture in patients with craniosynostosis treated after endoscopic-assisted strip craniectomy.

Methods: A total of 146 endoscopic-assisted cases for nonsyndromic craniosynostosis were retrospectively reviewed between 2006 and 2013. Patients with a syndromic diagnosis and multisuture synostosis other than bilateral coronal were excluded. Pre and one year postoperative head computed tomography scans were reviewed and patients that developed a neosuture were identified. Cephalic index (ratio of head width and length) preoperative and 1 year after the surgery were measured using calipers in patients with sagittal synostosis. A student t-test with significant value predetermined at p < 0.05 was used to calculate significant differences between the groups (Microsoft Excel 2010).

Results: Seventy-six patients (61 sagittal, 6 bilateral coronal, 5 unilateral coronal, 4 lambdoid) treated by endoscopic-assisted technique with pre and one year postoperative scans were identified. Neosuture development was seen in 23 patients (30%): 14 sagittal, 2 bilateral coronal, 4 unilateral coronal and 2 lambdoid synostosis (Fig. 1). No statistical difference in cephalic index was seen pre and 1-year postoperative in patients with sagittal synostosis. Pre and postoperative cephalic index in the neosuture group was 67.5% and 76.9%, while in the fused suture group it was 69.6% and 77.6%.

Conclusions: Neosuture development can occur after endoscopic-assisted strip craniectomy and molding helmet therapy for patients with craniosynostosis. Its relevance is still to be determined. Further studies are required to determine long-term outcomes comparing patients with continued fusion versus neosuture formation.

Figure 1. (Left) Preoperative CT scan showing sagittal synostosis. (Right) 1-year postoperative CT scan with neosuture formation.

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