

FL-003

Changes in nasofrontal angle on 3D photocephalometry after sagittal craniectomy with biparietal morcellation for scaphocephaly

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OBJECTIVE:Parents often tell us shortly after surgery for scaphocephaly that forehead shape is improved even when we have not directly reshaped it. We wondered, is this real or illusion? To investigate, we measured nasofrontal angles using 3D photocephalometry in subjects with scaphocephaly and compared the preoperative-to-postoperative change in angle between subjects who underwent open surgery with various extents of forehead remodeling.

MATERIAL-METHODS: We included all subjects from 2013 onwards who underwent sagittal craniectomy with biparietal morcellation (SCBM) +/- variations addressing the frontal bones and who had preoperative and postoperative 3D photos within 2 months before and 3 months after surgery. We compared the average preoperative-to-postoperative change in nasofrontal angle between 4 surgical groups: SCBM only (SCBM), SCBM with morcellation anterior to the coronal suture (SCBMA), SCBMA with lateral frontal bone barrel stave cranioplasty (SCBMA+BS), and SCBMA with bifrontal craniotomy/cranioplasty (SCBMA+Crani).

RESULTS:126 subjects underwent surgery. 54 were excluded due to timing of preoperative/postoperative photos. 30 SCBM subjects had an average preoperative-to-postoperative nasofrontal angle decrease of 1.03 degrees, 27 SCBMA subjects had an average increase of 0.40 degrees, 9 SCBMA+BS subjects had an average decrease of 0.53 degrees, and 6 SCBMA+Crani subjects had an average decrease of 0.28 degrees (nonsignificant).

CONCLUSION:Nasofrontal angles change little shortly after sagittal craniectomy with biparietal morcellation for scaphocephaly, regardless of surgical variations addressing the frontal bones. It may be that changes in nasofrontal angle occur later after surgery or that the nasofrontal angle does not reflect changes in forehead contour after surgery. We are currently graphing all nasofrontal angles versus time from surgery, including sequential postoperative photos obtained after 3 months, and also measuring nasofrontal angles in the same subjects using the metopion instead of the glabella as the upper point of the angle. We are also comparing changes in nasofrontal angle after endoscopic versus open surgery.

Keywords: sagittal craniostylosis, scaphocephaly, nasofrontal angle, 3D photocephalometry, sagittal craniectomy with biparietal morcellation

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evolution of coronal and lambdoid sutures following total vault remodelling for scaphocephaly

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OBJECTIVE:It is known that closure of coronal or lambdoid suture can be seen after surgical correction for scaphocephaly. However, its pattern was not studied in detail. The objective of this study was to evaluate if and when the coronal and lambdoid suture close after a complete vault remodeling for scaphocephaly.

MATERIAL-METHODS:Among all scaphocephalies operated in our pediatric neurosurgical service, twenty patients agreed to undergo a new CT scan for the purpose of this study. All patients were operated using the same surgical technique with a total vault remodeling. Both coronal and lambdoid sutures are removed with a gouge forcep.

RESULTS:Mean delay between the surgery and the CT scan was 5,5 years (min 1,3 years, max 11,4 years). Regarding the closure of the lambdoid sutures, we noted that, in all but one patient, the pattern of the suture was present on the post-operative control. Regarding the coronal sutures, half of the patient (n=10) had a closed suture. Closure could be seen as early as 1.3 years post op.

CONCLUSION:This series proves that coronal and lambdoid sutures can reappear with a normal pattern of growth after their surgical removal. This neoformation was observed mainly for lambdoid sutures that present a more physiological behavior. On the contrary coronal sutures more frequently close after the surgical removal. Questions remain to explain the reasons of such different evolution and the implication of the early coronal closure in relation with of neuropsychological evolution.

Keywords: craniostylosis, neosuture, children

FL-005

Endoscopic correction of scaphocephaly: do helmets affect treatment outcome?

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OBJECTIVE:According to previous studies the endoscopic treatment of scaphocephaly is effective. However, some studies question the need for postoperative use of helmets. Therefore, the aim of this study was to evaluate the effect of cranial orthoses on the outcome of the endoscopic treatment of scaphocephaly in children.

MATERIAL-METHODS:From 2013 to 2018, 192 endoscopic correction of scaphocephaly operations were performed. In all cases helmets were used after surgery, with one to three helmets used for each patient during the treatment period. The study included 123 patients with scaphocephaly, for whom the results of 3D-photogrammetric imaging were available. The imaging was done before the operation, at different stages of helmet treatment and during follow-up. For all cases included in the study 3D-models of cranial orthoses were also available. A comparative analysis of shape of the head of patients with scaphocephaly and dimensions of the helmets was carried out, for this, the dynamics of the cranial index(CI) were studied.

RESULTS:The morphology of the head (CI) at follow-up correlates with the same parameters of the cranial orthosis (P=0.54). The greater the difference between the CI of the helmet and the head, the greater the difference between the initial CI of the head and the CI at the follow-up (P=0.7). There was no effect of the duration of the helmet therapy on the final result. The greatest changes occurred during the first 2 months after surgery. The biggest changes in CI were found in patients with initially low CI. The effect of treatment depends on the patient's age.

CONCLUSION:Cranial orthoses significantly influence the change in the shape of the skull after endoscopic treatment in patients with scaphocephaly. The shape of the first helmet is most important, since it is during this period of time that the greatest changes in the shape of the head occur.

Keywords: craniostylosis, scaphocephaly, endoscopy, helmet