Long-Term Outcomes of One-Piece Frontoorbital Advancement with Distraction but without Bandeau for Coronal Craniosynostosis

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INTRODUCTION: Traditional frontoorbital advancement with a supraorbital bar is the standard technique for correcting coronal craniosynostosis. However, several reports indicate that cranioplasty using distraction osteogenesis can be an alternative. To maximize the advantages of distraction, preservation of the dura attachment to the frontal bone appears to be important. Therefore, we designed a novel procedure for coronal craniosynostosis involving a one-piece frontoorbital advancement with distraction but without a supraorbital bar using only a small temporal burr hole.

MATERIALS AND METHODS: The novel one-piece frontoorbital advancement technique was used in 32 coronal craniosynostotic patients. Follow-up ranged from 9~78 months (mean 36.2 months). Osteotomy on the fronto-parietal area was performed using a saw, and a burr hole of < 1.0 cm was made at the 'pterion'. While referring to a rapid prototype model, osteotomies in the orbital roof, zygomatico- frontal, nasion areas and pterion were performed using a guarded osteotome to protect the dura mater. Distraction devices were applied without detachment of the bone flap from the dura (standard cranial distraction protocols were used).

RESULTS: The present technique resulted in minimal bleeding, shorter surgery time and minimization of the bony defect with preservation of the dural attachment. The 1.0 cm burr hole allowed visualization of the greater and lesser sphenoid bone wings, which is necessary for a safe osteotomy. The average length of distractions was 19 mm. This approach was less invasive than the traditional approach and resulted in satisfactory correction. Transfusions were not required for 20 patients. The average cranial index decreased from 98 to 84. There were no complications other than a case of meningitis which resolved following intravenous antibiotic administration.

CONCLUSION: The one-piece fronto-orbital advancement without bandeau can be possible and a good alternative for the non-complex form of coronal craniosynostosis.

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