A Comparative Analysis of Complications in 55 Midface Distraction Procedures in Patients with Syndromic Craniosynostosis

Authors:

Jesse A Goldstein, MD
J Thomas Paliga, BA
Linton A Whitaker, MD
Jesse A Taylor, MD
Scott P Bartlett, MD

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Background: Most patients with syndromic craniosynostosis manifest midfacial hypoplasia that would benefit from midfacial advancement. Benefits of midfacial advancement by distraction osteogenesis have been well-studied; little has been written about the perioperative morbidity of these procedures, especially as they relate to device selection. This study was designed to compare the peri-operative complications between semi-buried and halo-type distraction osteogenesis of the midface.

Methods: A retrospective review was performed on all patients with syndromic craniosynostosis who underwent midface distraction with semi-buried or halo-type external distractors. Demographic information and operative/post-operative course were reviewed. Complications were categorized as hardware-related, infectious, and either as major (requiring additional intervention) or minor (requiring medication only). Chi-squared and Fisher’s exact test were used to compare variables.

Results: From 1999 to 2012, 54 patients underwent midface distraction osteogenesis including 23 patients with Aperts, 18 Crouzon, 10 Pfeiffer and 3 with other craniofacial syndromes. 33 patients underwent a total of 34 subcranial Le Fort III distraction procedures and 21 underwent 21 monoclock distraction procedures. Average age of surgery was 8.0 (range: 4.0-17.7) years, while average time between distractor placement and removal was 102.9 days. 30 procedures were performed with external halo-type distractors (18 Le Fort III and 12 monoblocks), while 25 were performed with buried midface distractors (16 Le Fort III and 9 monoblocks). There were no significant differences in diagnoses or operation type between distraction techniques. Of the 19 distractor related complications, there were a total 10 (18.2%) in the halo group including 5 (9.1%) requiring separate operative intervention and 9 (16.4%) in the buried distractor group including 6 (10.1%) requiring separate operative intervention. Serious infections were the more common in the buried distraction group (n=8) compared to the halo distractor group (n=3) (p=0.048). There were four (7.3%) patients in the halo groups who had malposition or transcranial pin migration related to post-operative positioning or falls and required operative repositioning.

Conclusions: Midface distraction is an important technique in patients with syndromic craniosynostosis. Higher rates of halo displacement requiring surgery are off set with lower rates of infections compared to buried distractors.