Safety and Efficacy of Derotational Osteotomy for Congenital Radioulnar Synostosis

Xavier Simcock, M.D.[1], Apurva S. Shah M.D., M.B.A.[2], Donald S. Bae M.D.[1], Peter M. Waters M.D.[1]

[1]Boston Children's Hospital, Boston, MA, [2]University of Iowa Hospitals and Clinics, Iowa City, IA

The historical complication rate following derotational osteotomy for congenital radioulnar synostosis exceeds 35% and includes a high risk of compartment syndrome and loss of fixation. Standardization of surgical technique can improve the safety and efficacy of this procedure by significantly diminishing the risk of neurovascular compromise and loss of fixation.

Methods:A retrospective evaluation of consecutive patients who underwent derotational osteotomy for congenital radioulnar synostosis at a single institution between 1995 and 2011 was performed. Patients with substantial functional limitations secondary to excessive pronation were indicated for surgery with a goal correction to 0 to 20 degrees of pronation. All patients were treated with a standardized surgical technique including careful subperiosteal elevation, rotational osteotomy at the level of the radioulnar synostosis, control of the osteotomy fragments, appropriate pinning techniques (with 2 to 4 Kirschner-wires), and prophylactic forearm fasciotomies. Pre-operative radiographs were reviewed to confirm the diagnosis. Electronic medical records were evaluated for pre-operative and post-operative forearm position, elbow motion, post-operative complications, and need for additional surgery. Post-operative radiographs were assessed for union.

Results: During the collection period, a derotational osteotomy utilizing the standardized technique was performed in 31 forearms in 26 children (13 bilateral, 13 unilateral) with a mean age of 6.8 years (range 3.0-18.8 years). The mean clinical follow-up was 30 months. The mean initial pronation deformity was 85 degrees (range 60-100 degrees). The mean correction achieved was 77 degrees (range 40-95 degrees), resulting in a mean final position of 8 degrees of pronation (range 0-30 degrees). All patients successfully achieved union by 8 weeks. There were no cases of compartment syndrome, vascular compromise, or loss of fixation. The overall complication rate was 12% (3 transient nerve palsies, 1 symptomatic muscle herniation). Two transient anterior interosseous nerve palsies were identified, with both occurring in patients with rotational corrections exceeding 80 degrees. One transient radial nerve palsy was observed, and was attributed to retractor placement.

67th Annual Meeting of The American Society for Surgery of the Hand
September 6-8, 2012, Chicago, IL