Preface

Craniomaxillofacial Distraction Osteogenesis

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In 1950, Sir Harold Gillies reported the first Le Fort III osteotomy with advancement, performed for a congenital condition, resulting in oxicephaly. Despite this pioneering accomplishment, he later abandoned the procedure due to difficulty with relapse. Many years later at a world congress in Rome (1967), Paul Tessier building on the work of Gillies, presented simultaneous intracranial/extracranial osteotomies, truly the inception of the field of craniofacial surgery. He showed that elective craniofacial osteotomies could be stabilized with the aid of bone grafting. Surgeons embraced the concept of craniofacial osteotomy, and began establishing protocols to produce reliable, stable skeletal movements. The ability to alter the shape and function of the craniofacial skeleton became a powerful tool for craniofacial surgeons. Despite early success, certain clinical situations made correction of craniofacial skeletal mismatch difficult to perform reliably and without relapse. Some patients had very large asymmetries, tight soft tissue envelopes, complex syndromes, and scarring from prior surgeries. An additional form of treatment was necessary to achieve success in a full range of anomalous presentation within the craniofacial skeleton.

Capitalizing on the seminal work of Codivilla and Ilizarov, McCarthy (1992) introduced the principle of distraction osteogenesis (DO) to the craniofacial skeleton, with successful lengthening of the mandible in a patient with craniofacial microsomia. Since that time, DO has proven to be a valuable technique for mandibular lengthening, and indications have expanded to include all levels of the craniofacial skeleton to

treat a variety of conditions including, but not limited to airway obstruction, malocclusion, exorbitism, cephalocranial disproportion, and increased intracranial pressure. In many ways, DO in the craniofacial

realm, is better suited than for its original purpose, to lengthen the axial skeleton. Throughout the head and neck region, vascularity to the bone is quite robust, providing an ideal substrate with which to generate new bone through distraction. Using the principles established initially by Ilizarov, DO within the craniofacial skeleton (1) can produce stable movements, (2) overcomes tight soft tissue envelopes, and (3) obviates the need for bone grafting.

For this issue of *Seminars in Plastic Surgery*, we wanted to illustrate the breadth and depth of the technique of DO within the craniomaxillofacial skeleton. The key areas are discussed, including challenges of cranial, monobloc, Le Fort II/III, Le Fort I, mandibular (neonatal), with additional comments from the craniofacial orthodontist's perspective. The authors assembled are enthusiastic practitioners of the various types of craniofacial DO, whose training, dedicated craniofacial practices, and academic minds, make them ideal people to share their thoughts. In addition, we were interested in not only the background and concepts of their respective fields, but also details of individual technique that provides success in their hands, and finally what they perceive as the unsolved riddles or areas of future study within the DO of the craniofacial skeleton.

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