Craniofacial Surgery

Paul Tessier, the father of craniofacial surgery, first presented his concepts internationally in Rome in 1967. The concepts were simple, but radically different from previous surgical beliefs. He showed that: (a) large segments of skull could be devascularized, yet survive; (b) large volumes of free autogenous bone grafts implanted into the skull survived: (c) repositioning of the eye need not affect vision; and (d) the brain shape or position could be changed without neurological deficit. His initial surgery was to correct previously untreatable congenital deformities. He developed the team concept utilizing a multiplicity of medical, dental and other disciplines, not only for investigation and planning, but also to insure safety in this drastic surgery. By 1971, Tessier was already warning that the number of teams should be limited.

Current Situation

Craniofacial surgery has now expanded from congenital problems to more effective management of tumors, acute or late trauma.

Surgical timing for congenital problems depends upon the patient's age, the type, severity, functional and psychosocial problems of the deformity. Under age 1 year, surgery is limited to correction of craniostenosis affecting the anterior skull half. Coronal metopic and anterior basal skull stenosis are ideally corrected between 3 to 6 months. However, the more complete craniostenosis of craniotelencephalic dysplasia and Kleeblattschadel should be corrected upon diagnosis. Initially, it was hoped that early advancement of the forehead in Crouzon and Apert syndromes would result in fewer patients with maxillary hypoplasia. This has yet to be proven. Indeed, there is no proof that more patients have normal forehead growth from combined neurosurgical and craniofacial techniques than from previous methods of neurosurgical strip craniectomy.

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Entire orbital movements for orbital hypertelorism or dystopia are best performed after age 2. Again, it was hoped that early eye positioning would improve vision, but this has not been proven.

The next general period for intervention is age 4 to 6, enabling children with grotesque facial features to enter school without being ostracised. The forehead and maxilla are advanced to more completely correct proptosis, improve nasal breathing and occlusion in Crouzon and Apert syndromes. The more severe cases of periorbital bone hypoplasia or absence in Treacher-Collins syndrome are treated. In hemifacial microsomia with absent bone, the maxilla and mandible are rotated and levelled and the absent bones and temporomandibular joint constructed.

Maxillofacial surgery for occlusal correction prior to growth completion in adolescence is liable to partial regression. However, if psychosocial problems are severe, early intervention is justified, providing both parents and patient realize the possibility of repeat surgery.

Functional improvements from craniofacial surgery can occur, but are few. Skull expansion at any age will correct raised intracranial pressure due to multiple suture craniostenosis. Vision can be preserved in exorbitism (the eye positioned anterior to the orbital margins) by orbital expansion. Advancement of the nose and maxilla in Crouzon and Apert patients can alleviate nasal airway obstruction and may permit olfaction. Correction of malocclusion may improve speech and chewing problems, but never digestion. The over-riding benefit of craniofacial surgery is psychosocial, enabling the patient to be treated normally. Ideally, all deformities should be treated as young as possible. Current timing is a balance between utilizing growth forces, skeletal immaturity, functional problems, adverse effects on skeletal growth and psychosocial problems.

The Future-Problems

The future of craniofacial surgery is assured, but its development depends upon the

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moral integrity of individuals and institutions. A craniofacial surgeon should be fully trained in all aspects of general and plastic surgery and then take extra training with an established craniofacial team. Most plastic and oral surgeons have not had sufficient training to undertake major facial osteotomies.

An Alarm Signal

In 1971, Tessier emphasized the need to limit the number of teams. By 1979, he posted an alarm signal about the burgeoning number of "Occasional specialists" in craniofacial surgery. He stated that he was "frightened when a person is happy doing 10 to 20 craniofacial operations a year". There is no place for the "occasional specialist" in craniofacial surgery, cardiac surgery, neurosurgery, orthognathic surgery or racing motor cars.

The result of individuals doing few operations or experienced surgeons doing itinerant surgery has already caused unnecessary deaths, blindness, brain damage and infection. Craniofacial surgeons are not better or wiser than others, but they must be true specialists and be accepted as such. The generalist with "an interest in craniofacial surgery" is a menace to the public. No one reading this article would like his or her heart operated upon by a general surgeon "interested in cardiac surgery".

The Future-Solutions

Craniofacial deformities are rare. Quality of results cannot be improved without the development of technical expertise by constant usage. Long term surgical effects can only be determined by evaluating many patients followed for many years in one center. If teams sprout like weeds in a field, without rationale of patient population or geographic locale, the result will be inhibition of research and development. Will basic questions in craniofacial surgery still be unanswered in 20 years because the ego of individuals and institutions has risen above moral rectitude? Tessier now states "one team per 100 million population", based on a premise of one new major craniofacial anomaly per 5,000 to 20,000 live births. When doctors become more aware of craniofacial surgical possibilities and refer them to regional centers, then the incidence will probably be higher. Teams, including several craniofacial surgical specialists,

EDITOR'S NOTE

This is the first of a new and regular feature. It is not intended to be a definitive review of the scientific achievement in a field. Rather, it will be a personal essay, subjective, and perhaps controversial.

These essays will not be reviewed prior to publication and will not reflect the opinion of the Editor or the policy of A.C.P.A. Comments from readers are anticipated and will be published in subsequent issues.

financed and interested enough to eliminate the need for other types of work, handling craniofacial tumors, trauma and congenital deformities, will probably suffice for populations of 20 to 30 million. Such an ideal will permit rapid advances in knowledge, such as the true incidence, effects of growth and surgery; length of surgery and morbity will be decreased and quality of results improved. Surgeons owe their patients more than an "interest".

Regional Centers - A Dream-Perhaps

A Possibility-Certainly
A Problem-There are no problems, only solutions!

Suggested Reading

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