



## Newsletter, October 2000

### Origins of Orthognatic Surgery\*

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The presence of facial deformity today significantly affects a child, frequently ostracised and often treated unkindly. Only rarely in a few societies in the Ancient World were they acceptable and where deformed persons with clefting deformities given a significant place as in the cultures of Central and South America. In the first millennium in Europe the face was portrayed in an idealized, stylistic way and it was only in the 15<sup>th</sup> and 16<sup>th</sup> centuries that painters started to portray deformity and also to identify the features of normality. This was especially true of Leonardo da Vinci, Dürer and Raphael.

The recognition of deformity unfortunately did not lead to its treatment, only with the development of modern general anaesthesia did it become possible to correct major facial deformity. The development of surgical techniques was based largely on the methods used to resect tumours or treat trauma of the facial bones. Cheever in the USA and von Langenbeck and Dupoytren in Europe were among the first to shift portions of the face for this purpose – mostly this was in the midface.

The first surgical procedure on the mandible for deformity was carried out by Simon P Hullihen in Virginia in 1848 on a 20 year old girl with gross facial deformity resulting from burns. A carefully thought out three stage procedure including osteotomy of the mandible and soft tissue surgery was carried out, remarkably without any form of anaesthesia resulting in a much improved appearance and functional activity of the lips and jaws, but this was an isolated case.

Following on Edward Angle's work in St Louis, in the orthodontic field, he recognised that not all dentofacial deformity could be corrected orthodontically, and he suggested the body osteotomy for the correction of mandibular prognathism. This was first carried out on a medical student at the turn of the 19<sup>th</sup> century by Vilray Blair, a talented general surgeon. He achieved a good aesthetic result by using splints on the teeth and intermaxillary fixation. There were however many failures and most orthognathic surgery required intermaxillary fixation.

Vilray Blair in the USA was one of the early pioneers of mandibular surgery whilst Berger in France was working independently on surgery of the mandibular condyle to correct mandibular prognathism with condylectomies and osteotomies. The problems of anterior open bite were well recognised and various attempts by Wayne Babcock were made to correct this with ramus

surgery. The relative merits of ramus surgery and surgery in the anterior body of the mandible were being debated. Further developments occurred after the first world war with the adaptation of techniques developed for fracture treatment being used in orthognathic surgery. René Le Fort in his experimental work on cadaver skulls in 1901, identified the sites at which fractures in the midface occur and it was from this development that the various osteotomies in the midface were elaborated.

The great German schools developed with Gunther Cohn Stock, Martin Wassmund and Schuchardt in Berlin who systemized and refined osteotomy techniques both for the midface and mandible in the 1920s and 30.

Kostecka was the first to use the Gigli saw for limited access surgery to the mandible whilst Cohn Stock and Axhausen developed the Le Fort I osteotomy for the correction of lower midface maxillary deformity. Trauner, Hugo Obwegeser and Köle of the Austrian school were great pioneers in midface and mandibular segmental surgery and the use of the genioplasty. Obwegeser's sagittal split osteotomy revolutionised surgery for mandibular hypoplasia. He also refined the techniques for midface surgery and was a pioneer in the field of sub-cranial midface correction of deformity.

The first high level Le Fort III midface osteotomy was carried out by Sir Harold Gillies in the UK for a patient with severe craniofacial deformity of Crouzon. He pioneered the way for the great French surgeon Paul Tessier in the correction of major mid and upper face deformities. Paul Tessier transformed the situation for major cranio-orbital midface deformity with his elegant correction of monstrous faces. In the UK, Derek Henderson and Ian Jackson modified some of these techniques for specific cleft deformities.

The advances of maxillofacial technology during the last three decades of the 20th century resulted in greater comfort for patients, less relapse and the avoidance of intermaxillary fixation. Plating techniques were developed primarily in Europe by Spiessi and Luhr, these techniques had been used by orthopaedic surgeons on a large scale but were adapted for the management of facial trauma and deformity. Finally in the last decade the most major change in management of facial deformity occurred when the distraction osteogenesis techniques of Ilizaroff were modified for the correction of deformity in the jaws. This avoided the frequent necessity for the use of autogenous bone grafting. McCarthy and Molina in the USA and Mexico dealt with the secondary deformity of the patient with a cleft lip and palate and allowed predictable correction of major deformity in that area as well as the correction of gross mandibular asymmetry. Refinements with use of resorbable materials will no doubt proceed well into the 21<sup>st</sup> century but where will it all end? There will be without doubt be a continuing quest for aesthetic perfection for the oral and maxillofacial surgeon.

\* Abridged version of the Lilian Lindsay Memorial Lecture delivered at the Lindsay Society for the History of Dentistry, National Exhibition Centre Birminham, 8 April 2000

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