

## Traumatic Craniofacial and Congenital Malformations and Deformities

**Raja Kummoona\***

*Emeritus Professor of Maxillofacial Surgery, Iraqi Board for Medical Specializations, Baghdad, Iraq*

**\*Corresponding Author:** Raja Kummoona, Emeritus Professor of Maxillofacial Surgery, Iraqi Board for Medical Specializations, Baghdad, Iraq.

**Received:** March 19, 2021; **Published:** May 27, 2021

Traumatic injuries to the craniofacial regions might lead to death because of severe injuries to cranial cavity and injuries to the chest and abdomen with limbs involvement. Death occurred because severe laceration to the brain and damages the respiratory system and abdominal uncontrolled injuries to the liver, spleen and kidneys. Early transportation and lifesaving measuring procedures might save the victims or in cases with less severe injuries, once mistreated will end to deformities of the skull, facial skeleton including the orbits, maxilla and mandible and in children might end with ankylosis of the temporomandibular joints (TMJ) with disturbance of growth of the mandible and midface.

The advances in the treatment of Craniomaxillofacial injuries have been achieved by advances in medications, tools of examinations including ultrasounds, CT scans and MRI, progress in medication and anaesthetic techniques.

The care of injured patients by advancing trauma life support care by application of the Kummoona 4 Golden C and ATLAS, 1- Control of breathing and patent airway with tracheotomy if required. 2-Control of circulation and shock by intravenous fluid, plasma and blood after blood grouping. 3- Control of bleeding by cauterisation of small vessels and ligation of large vessels. 4- Control of soft tissue laceration and control of bony fragments by reduction and fixation.

Facial deformities and malformations are quiet interesting topic, these diseases effecting the skull, face and facial skeleton making the life of patient's miserable life and excommunicated from the society. The aetiology of facial deformity either traumatic or hereditary or genetic with chromosomal aberrations.

These deformities either unilateral effecting the face like First Arch Syndrome and ankylosis of the temporomandibular joint (TMJ) or bilateral cases like treachery Collins Syndrome or cases involve the skull and face deformities like Crouzon disease or Apert disease or Craniofacial synostosis.

An example for these cases the first arch syndrome, the aetiology is due to early occlusion of step dial artery of 1<sup>st</sup> and 2<sup>nd</sup> Branchial arches during embryonic development, the sever cases was clinically presented as Hemifacial microsomia with absence of glenoid fossa, zygomatic process of temporal bone and upper part of ascending ramus of the mandible, the TMJ absent with absence or partially absent ear with wide cleft of the angle of the mouth and underdeveloped midface and the face twisted to affected side.

Great advances been carried during the last five decades by discovery of Penicillin during the second world war by Sir Ian Fleming of St Mary's Hospital, Paddington, London. This revolutionary discovery of antibiotic make surgery easier and more controlled from infection specially during the war for managements of injured soldiers.

Another advancement of Craniofacial surgery is by improving the instrumentation been used for managements of major surgical procedures carried on skull reshaping and osteotomies procedures in the facial skeleton beside the discoveries of advance examination tools like doppler ultrasound and three dimensions CT scan with MRI, all these tools improve or became possible to do intra uterine surgery for correction of cleft palate, managements of Pierre Robin Syndrome and facial cleft by endoscopic technique before childbirth.

One of the great advances of Craniofacial Surgery nowadays is by application of three factors of osteotomies for correction of jaw deformities, bone grafting for reconstruction of bony defect and distraction technique for elongation of bones. The osteotomies technique was used for elongation and advancement of jaws or push back or for correction of open bite.

Distraction is defined as process of generating new bone by stretching. Traction on living tissue stimulate and maintaining regeneration and growth by inducing proliferation by precursor cells. This technique was advocated by a genius Russian Orthopaedic surgeon Ilizarof, he designed his technique for elongation of limbs in children, McCarthy of New York few years later applied this technique on lower jaw of patients with First Arch dysplasia syndrome.

The distraction technique passes through three phases, the surgical phase, the Latent period phase and the consolidation phase. The most critical phase is the Latent period phase.

Experimental studies were conducted on Rabbits to understand the cellular changes associated with Distraction technique and bone grafting. Distraction was achieved by using bilateral distractor. The hand bone lengthening apparatus was adjusted with 1.5 mm Kirshner wire and was passed through both mandibular bodies. Rhythmic distraction of both cortectomies of the bone using an osteotome was carried out at a rate of 1 mm/day at the rhythm of 0.5 mm twice daily, proceeded by Latent period of 7 days. The period for distraction lasted 10 days surgery was followed by antibiotic administration.

The segments were held by an external fixator for 6 weeks until consolidation was completed. Bone evaluated radiologically for periods of 2 weeks, 4 weeks and 8 weeks.

Bone grafting is that technique been used for replacing missing bone that occurred in trauma or for reconstruction of the lower jaw after radical cancer surgery immediately and for reconstruction of facial deformities and reconstruction of the orbital floor for correction of traumatic enophthalmos and diplopia or for reconstruction of the TMJ by using Kummoona Chondro-Osseous graft for restoring growth, repair and remodelling of the condyle in cases of TMJ ankylosis and in moderate and milled First Arch Syndrome.

Bone grafting is possible because bone tissue can regenerate completely once the space is provided for it to grow as natural bone.

We did experimental studies on rabbits for studding the mechanism and cellular changes on both distraction and bone grafting.

We observed the cellular changes of bone grafting showing the formation of granulation tissue with mesenchymal stem cells derived from bone marrow of bony segments of the mandible and from periosteum and covering muscles with release of platelets growth factor (PGF) with large number of fibroblasts and tiny, small blood vessels, osteoblast was noticed with chondrocyte and osteoid tissue.

It was concluded from our research by experimental studies and research on both distraction technique and bone graft technique that, the cellular changes that occur in bone grafting and distraction with these different surgical techniques are the same with the presence of mesenchymal stem cells and PGF and the only differences are the distraction caused by expansion stress of periosteum and muscles and bone graft by rigid fixation with decortication of both graft and stumps of bones.

**Volume 10 Issue 6 June 2021**

**©All rights reserved by Raja Kummoona.**