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Guest Editorial

Personal Experience on Reconstruction of the Temporomandibular Joint Disease

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Reconstruction of the temporomandibular joint an interesting topic deserve writing about it.

My experience extends to more than 40 years in research and clinical application, this situation encourages me to write about it. This topic including reconstruction of the Temporo-mandibular joint (TMJ) by two-part prosthesis, biological reconstruction of the TMJ by Chondro-Osseous graft and reconstruction of the TMJ for managements of subluxation and dislocation of the joint.

The surgery of the TMJ is rather difficult required experience, knowledge and skill and I do not think every maxillofacial or craniofacial surgeon practice this kind of surgery because the difficulties and complication raised during surgery, the area very complicated from anatomical point of view and possibilities of injuries to facial and auriculo-temporal nerves, inner ear and parotid gland and injuries to superficial temporal and maxillary arteries and transverse facial artery. This type of surgery was great challenge to the surgeons.

Joint replacement surgery is an orthopaedic surgery in which arthritic or dysfunctional joint replaced by orthopaedic prosthesis and indicated for various joint disease, including osteoarthritis, rheumatoid and ankyloses.

Stephen S Hudack 1939 did his animal experiment with artificial joint, previously two popular forms of arthroplasty as interposition arthroplasty with interposition of some other tissue such as skin, muscle or tendon to keep inflammatory surfaces apart and the second type is the excisional arthroplasty in which joint surfaces and bone removed leaving scar tissue to fill the gap [1].

The most successful procedure done before few decades is the total hip prosthesis and the pioneer work of Sir John Charnley (1911 - 1982) in the beginning of 6th decade of last century he did his total hip replacement by two part prosthesis, it was great challenge to British surgery and worldwide at that time to relief the suffering of old people who became cripple by degenerative disease and TB of hip joint [2].

Sir John Charnley give us the green light for pioneer work by advocating replacement of the TMJ joint by Kummoona two-part chrome cobalt prosthesis (1978), we were the pioneer in that work supported by experimental studies on Mecaca Iris Monkeys.

In this pioneer research work the prosthesis designed to replace damaged TMJ, consist of two-part prosthesis to satisfy the function of the joint and to restore normal functional activities of mastication including lateral excursion, the condylar part consist of head and neck representing 1/3rd of the total length of the lower prosthesis or the perforated intermedullary shaft, the aim is to transfer the load of masticatory process to the mandible, the total length of the lower prosthesis is between 4 - 5 cm, the shaft inserted inside the cancellous bone and fixed by bone cement, the upper part consist of plate to cover the glenoid fossa with extension to zygomatic root of temporal bone with one or two holes for fixation by stainless steel wire of 0.5 mm to the zygomatic process. Microradiograph done by sagittal section of the specimen of the TMJ and glenoid fossa for both top prosthesis and lower prosthesis, showed the prosthesis in excellent direction along the access of the ascending ramus for distribution the load of mastication. The histology of the ascending ramus with

lower prosthesis showed healthy granulation tissue with healthy fibrous tissue around the bone cement surrounding the prosthesis. This technique was designed for adult patient where the growth is completed, series of cases been treated by this technique [3,4].

Biological reconstruction of the TMJ by Kummoona Chondro-Osseous graft, we advocate this method of reconstruction of TMJ in the early of 1980 and published for first time 1986. This technique designed for reconstruction of TMJ children for diseases of ankylosed TMJ and for cases of milled First arch dysplasia syndrome, the aim of this technique was to restore the normal growth pattern of the condyle and for repair and remodelling of the condyle. The graft harvested from iliac crest of child between 5 - 6 years it consists from cap or head of 1 cm length and osseous element of 4 - 5 cm firmly attached to cartilaginous part [5].

This graft proved much more superior to the previous technique of Costa-Chondral graft because the element of cartilaginous part is firmly attached to osseous element of the graft, no over growth of the graft was reported and no intermaxillary fixation required but firmly the graft fixed to ascending ramus with excision of ankylosed joint and hyperplastic coronoid process.

The graft has an endogenous growth potential as multidirectional due to contain of mesenchymal stem cells in the second granular cell layer and hypertrophic chondrocyte converted to chondrocyte and osteocyte. By animal experiment on Rabbits and after termination of the experiment, specimen of TMJ Rabbit, we found 4 layers, the first layer is thick fibrocartilage and the second is the round mesenchymal stem cells layer this layer represent proliferative layer, the third layer consist of cells of iliac crest layer converted from columnar type to multidirectional type due to change of function from weight bearing to masticatory function simulating condyle, the fourth layer where the endochondral ossification occurred, the chondrocyte became swollen through series of changes of endochondral conversation to osteoid tissue, the fourth layer showed bone trabeculae and living cells in bone marrow spaces and arranged according to direction of masticatory forces. This technique was applied in series of cases of children with TMJ ankylosis, First dysplasia syndrome and hypoplastic condyle [6,7].

The third technique was biological reconstruction of the TMJ for treatment of recurrent sub luxation and dislocation of TMJ [8]. This type of disease is very annoying to people and depressing could be an acute dislocation happened during yawing or even laughing, the aetiology and pathogenesis of chronic recurrent subluxation or dislocation quiet common in Yamen due to daily Qat chewing and due weakness and lax capsule have been attributed to trauma or abnormal chewing and found in people with general joint laxity as in Ehlers-Danlos syndrome, Marfin syndrome and juvenile rheumatoid arthritis and in old people and in patients with internal derangement's of TMJ [10].

The condyle can be reduced by us by standing behind the patient and both thumbs of the surgeon placed above molar teeth or on the ridge of mandible with fingers wrapped externally around the mandible, the surgeon started to move the mandible in rotational manner through the transverse axis of the angle that were used and asking the patient to be relaxed, and by using the angle of the jaw as pivot and rotated downward unilaterally the surgeon concentrated on unilateral reduction immediately the condyle jumped to glenoid fossa in one side and the other side reduced by itself. This technique better than old technique which require general anaesthesia. The old technique based on downward and backward movements, it's not necessary to use any downward and backward push [9,10].

For old people with lax capsule of the TMJ and flat glenoid fossa with atrophy of articular eminence, the surgical procedure done by plication of the capsule, by exposing the capsule and reverse L shape flap incision, the flap advanced forward to cover the lateral and anterior part of the joint capsule for reinforcement and eminectomy, this ideal technique advocated by us since many years and proved very useful for old people [8-10].

The more advance technique for reconstruction of the sub luxation and dislocation of the TMJ in young people required using finger type flap inferiorly based of temporal fascia of about 3 - 4 cm length used for reconstruction of the lateral and anterior part of lax capsule for re enforcement and bone graft from iliac crest impacted in ostectomy site of ½ cm and the graft impacted in the ostectomy site and work as obstacle to prevent forward movement of the condyle [8-10].

We present a brief description of surgical reconstruction of the TMJ representing our experience and techniques advocated for managements of these difficult surgical cases.

Bibliography

1. Wikipeda. Joint Replacement (2019).
2. Charnley J. "The bonding of prosthesis to bone by cement". *Bone Joint Surgery* 46B (1964): 518-529.
3. Kummoona R. "Functional Rehabilitation of ankylosed Temporomandibular Joint". *Oral Surgery, Oral Medicine, Oral Pathology* 46.4 (1978): 495-505.
4. Kummoona R. "Temporomandibular joint reconstruction with a 2 part chrome cobalt prosthesis, chondro-ossous graft and Sialastic: clinical and experimental studies". *Journal of Craniofacial Surgery* 20.6 (2009): 2125-2135.
5. Kummoona R. "Chondro-Ossous Iliac Crest Graft for one stage reconstruction of ankylosed joint in children". *Journal of Maxillofacial Surgery* 14.4 (1986): 215-220.
6. Kummoona R. "Kummoona Chondro-Ossous Graft, Good Substitute to Condylar Growth Center and for Correction of Facial Deformity in Children". *Archives of Otolaryngology and Rhinology* 3.3 (2017): 98-102.
7. Kummoona R. "Kummoona Chondro-Ossous Graft for Reconstruction of the Temporomandibular joint in Chilidren". *Archives of Clinical and Experimental Orthopaedics* 1 (2017): 1-3.
8. Kummoona R. "Surgical Reconstruction of the Temporomandibular Joint for Chronic Subluxation and Dislocation". *International Journal of Oral and Maxillofacial Surgery* 30.4 (2001): 344-348.
9. Kummoona R. "Surgical Reconstruction of the TMJ for Chronic and Acute Subluxation and Acute and Chronic Dislocation". Clinical and Experimental Studies, cited in Book, edit, Raja Kummoona (Disease of the Temporomandibular Joint, Surgical Reconstruction, Clinical and Experimental Studies. Science Publishing Group. New York (2014).
10. Kummoona R. "Surgical Managements of Subluxation and Dislocation of the Temporo mandibular joint: Clinical and Experimental Studies". *Journal of Craniofacial Surgery* 21.6 (2010): 1692-1697.

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