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Innovation of new clinical concepts in the correction of facial deformity of patients with post-traumatic condylar hyperplasia condition

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ABSTRACT

Post traumatic condylar hyperplasia condition is an increase in the total number of cells due to increased activity, which exist only as long as the activity or the stimulus is applied. When it is removed, the tissue returns to the normal state; however, a secondary structural alteration in the general architecture due to accompanying degeneration may render a complete return to the normal state impossible. Mandibular asymmetry following condylar injury is poorly documented as a cause of facial asymmetry. leFort1 (low-level fracture) osteotomies and bilateral sagittal mandibular osteotomies, which are comprehensive surgical plans, correct the facial deformity together with the occlusion. An innovation of new clinical concepts has been used in the correction of facial deformity in 11 patients with post-traumatic condylar hyperplasia condition (syndrome) by applying a new modified allo plastic material (subperiosteal acrylic implant).

Keywords: *condylar hyperplasia, facial asymmetry, trauma*

INTRODUCTION

Mandibular overgrowth and asymmetry due to post-traumatic condylar hyperplasia was first described by Lund in Denmark 1974 in a cephalometric study of mandibular growth following condylar fractures**.**

Twenty-one patients were presented who developed unilateral mandibular overgrowth secondary to condylar hyperplasia with history of trauma to the condyle (1), with prominent features including enlarged mandibular condyle (2), elongated condylar neck (3), outward bowing and downward growth

of the body, and ramus of mandible on the affected side (4), causing fullness of face on that side and a flattening of face on the contralateral side (See Figure 1).

Unilateral condylar hyperplasia must be differentiated from other states of overdeveloped mandible such as hemifacial hypertrophy, which is a unilateral enlargement of all hard and soft tissues of the face, or chondroma and osteochondroma, which produce similar symptoms and signs but they grow rapidly and may cause a greater asymmetric condylar enlargement. Some patients had a clearly documented condylar fracture but on the opposite side from the deformity (5). Other patients had a normal mandible prior to dislocating T.M.J injury (6). Some other patients' injury occurred over 2 decades prior to presentation and was documented only by history and had a possible subclinical condyle fracture. In all of these patients, condylar hypertrophy seemed to have resulted from a nonfracture injury. All patients are young adults, with the male to female ratio of 2:1.

FIGURE 1. Post-traumatic condylar hyperplasia (right-hand side).

MATERALS , METHODS, AND DISCUSSION

Five patients were treated for leFort1 (low-level fracture) osteotomies and bilateral sagittal mandibular osteotomies (7), which are comprehensive surgical plans for correcting facial deformity together with the occlusion (See Figure 2).

An innovation of new clinical concepts has been used in the correction of facial deformity in 11 patients with post-traumatic condylar hyperplasia condition (syndrome) by applying a new modified alloplastic material (subperiosteal acrylic implant) (8). The occlusion is then corrected using conservative methods such as orthodontics, crown and bridge, or partial denture (See Figure 3). The objectives of this implant surgery are as follows.

1. Excellent permanent aesthetic result.
2. Indicated to patients who are medically contraindicated to osteotomy surgery.
3. Causes less trauma to patients.
4. Less time-consuming for the surgeon.
5. Retains its shape, thickness, and position (no migration).
6. No resorption when subjected to pressure.
7. Light in weight and not rejected by patients' tissue.

FIGURE 2. Patient before and after osteotomies.

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FIGURE 3. Patient before and after implant surgery and occlusion correction.

Twenty-one patients with a primary complaint of facial asymmetry due to post-traumatic condylar hyperplasia, who visited the outpatient department of the maxillofacial surgery, were selected. A detailed history of the mode of onset and duration was recorded, and any obvious facial asymmetry or deviation of the chin was examined. Routine hematological examinations were carried out on all patients preoperatively. The patients were operated through extra oral approaches under general anesthesia with nasoendotracheal intubation. A new modified alloplastic acrylic implant was used to restore the symmetry of the face in 11 patients who were medically contraindicated to an extensive osteotomy surgery or who refused such surgery.

An incision was made at the lower border of the mandible (to avoid a visible scar). By dissection, a surgical tunnel was created at the lateral surface of the body of the mandible and the ascending ramus on the normal side (avoid the mental nerve).The surgical tunnel enlarged enough to accommodate the subperiosteal acrylic implant. The implant was then inserted under the periosteum posterior to the second lower premolar (avoiding the mental nerve) through the surgical tunnels created at the lateral surface of the normal side of the mandible and the ascending ramus. The implant was then fixed by a 0.5 mm stainless steel wire to the lower border of the mandible to prevent any possible movement of the acrylic implant (migration) (9) which may change the postoperative aesthetic appearance of the patients. The wound closed in layers, and systemic antibiotics were given for 5 days postoperation as a prophylactic measure against infection. This surgery was found to give a good postoperative permanent facial symmetry result. The facial deformity can be corrected by the same surgical procedure using a problast subperiosteal implant, which is a new material used especially for a surgical implant (10). It is ultraporous (70–90% porous by volume), which ensures rapid stabilization of the implant by tissue during growth and avoids encapsulation; therefore, it needs no immobilization to the bone like other subperiosteal implants. It is easily carved with a scalpel or a high-speed bur to permit fitting with minimal additional shaping during surgery (11,12).

The problast was found to be nonsatisfactory in the correction of facial deformity due to post-traumatic condylar hyperplasia as it is resorbed by pressure during sleep on the problast side. Many other implants such as ceramics (13) and chrome cobalt bone mesh (14 have been used to restore the

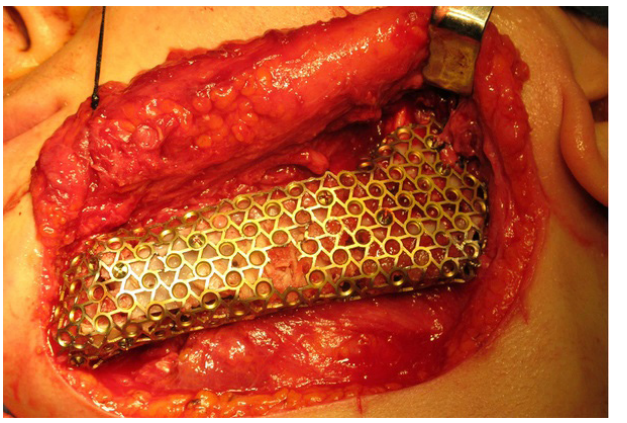

FIGURE 4. Chrome cobalt bone in position.

Table 1. Demographic Data on Treatment and Results

No. of patients	Age	Sex	Side	Diagnosis	Treatment	Result
5	22–30	M	Rt & Lt	Post-traumatic condylar hyperplasia	Mandibular osteotomies	Good esthetics
6	20–28	M	Rt & Lt	Post-traumatic condylar hyperplasia	Acrylic implant	Good esthetics
5	20–28	F	Rt & Lt	Post-traumatic condylar hyperplasia	Acrylic implant	Good esthetics
1	28	F	Lt	Post-traumatic condylar hyperplasia	Problast implant	Nonsatisfactory
2	22–24	F	Lt & Rt	Post-traumatic condylar hyperplasia	Ceramic implant	Nonsatisfactory
2	25–28	M	Rt & Lt	Post-traumatic condylar hyperplasia	Chrome cobalt bone mesh	Nonsatisfactory

symmetry of the face, and all such implants have found to give a nonsatisfactory result.

Ceramics, which are crystalline structures of inorganic nonmetallic mineral salts produced at a high temperature and are used as a bone graft substitute, are found to have difficulties in fixation to the underlining bones with a major position migration postoperation. Chrome cobalt bone mesh (14) used as a mandibular onlay prosthesis was found to give no satisfactory result postoperation because it requires extensive surgery and results in difficulties in adapting to the mesh (See Figure 4).

RESULTS AND POSTOPERATIVE FOLLOW-UP

The lefort1 osteotomies and bilateral sagittal mandibular osteotomies, which are comprehensive surgical plans that correct the facial deformity together with the occlusion, are the treatment of choice for mandibular overgrowth and asymmetry due to post-traumatic condylar unilateral hyperplasia. An innovation of new clinical concepts has been used in the correction of the facial deformity in 11 patients due to post-traumatic condylar hyperplasia condition (syndrome) by applying a new modified alloplastic material (subperiosteal acrylic implant) and was found to give a good satisfactory result.

The first 3 months of postoperative follow-up of the patients treated with problast showed 90% success for the problast and only 5% for position migration.

Five years of postoperative clinical follow-up of patients with the problast showed complete resorption of the problast due to pressure during sleep on the problast.

The acrylic is a radiolucent material, and post operative X-ray scanning of the mandible shows nothing of the alloplastic acrylic material. A regular 5 years' post-operative (clinical) follow-up study of the patients treated by the acrylic implant showed that the acrylic implant retains its shape and thickness and gives a good permanent symmetry of the face.

REFERENCES

1. Ball.J. Recent Advances in Pathology 7th Ed. London 2009.
2. Slootweg PJ, Muller H. Condylar hyperplasia. A clinicopathological analysis of 22 cases. J Maxillofac Surg. 2009;14:209–214. https://doi.org/10.1016/S0301-0503(86)80291-0
3. Matteson SR, Proffit WR, Terry BC. Bone scanning with 99m technetium phosphate to assess condylar hyperplasia. Oral Surg Oral

Med Oral Pathol. 2011;60:356–367. https://doi.org/10.1016/0030-4220(85)90255-5

4. Gidado, A., Boonpisuttinant, K., Kanjanawongwanich, S. Anti-cancer and Anti-Oxidative Activities of Nigerian Traditional Medicina Plants/Recipes. Journal of Complementary Medicine Research. 2019;10:200–211. https://doi.org/10.5455/jcmr.20190731050619
5. Hodder SC, Rees JI, Oliver TB, Facey PE, Sugar AW. SPECT bone scintigraphy in the diagnosis and management of mandibular condylar hyperplasia. Br J Oral Maxillofac Surg. 2014;38:87–93. https://doi.org/10.1054/bjom.1999.0209
6. Nitzan D, Katsnelson A, Bermanis I. The clinical characteristics of condylar hyperplasia: Experience with 61 patients. J Oral Maxillofac Surg. 2008;66:312–318. https://doi.org/10.1016/j.joms.2007.08.046
7. Pogrel MA. Quantitative assessment of isotope activity in the temporomandibular joint regions as a means of assessing unilateral condylar hypertrophy. Oral Surg Oral Med Oral Pathol. 2015;60:15–17. https://doi.org/10.1016/0030-4220(85)90206-3
8. Markey RJ, Potter BE, Moffett BC. Condylar trauma and facial asymmetry: an experimental study. J Maxillofac Surg. 2013;8:38–51. https://doi.org/10.1016/S0301-0503(80)80071-3
9. Jagielak M, Tomasik D, Piekarcsyk B,Piekarczyk J, Orthognatic surgery of condylar hyperplasia and other deformaities disturbing facial symmetry. Int J Oral Maxillofac Surg. 2010;34(4):364–368.
10. Mohammad J. Al-Abdullah. Side Effects of Objective Methods and Subjective Methods from the Efficacy of Intense Pulsed Light versus Benzoyl Peroxide 2.5% Gel in Treatment of Mild to Moderate Facial Acne Vulgaris in Iraqi Patients. PNR. 2021;12(2):29–31. https://doi.org/10.1016/S0301-0503(80)80071-3
11. Marinez-Lage JL, Gonzalez J, Pineda A, Alvarez I, Condylar reconstruction by oblique sliding verticalramus osteotomy.J Craniomaillofac Surg. 2013;32(3):155–160. https://doi.org/10.1016/S0301-0503(80)80071-3
12. Wolford LM, Morales-Ryan CA, García-Morales P, Perez D. Surgical management of mandibular condylar hyperplasia type 1. Proc (Bayl Univ Med Cent). 2014;22:321–329. https://doi.org/10.1016/S0301-0503(80)80071-3
13. Lighterman, I. Mandibular Fracture treated with plastic polymers. Journal of Oral. surg. Chicago. 2008.
14. Surgical mandibular reconstruction with implants, mandibular prosthesis A. J oral surgery, 2015.
15. Hemachandran, M., Sivashanmugam K. Feasibility Study of a Blockchain use in Nutraceuticals Supply Chain. IJPRT. 2021;11(2):33–43. https://doi.org/10.31838/ijprt/11.02.06
16. Moore WR, Graves SE, Baom GL. Ceramic synthetic bone graft substitutes AN2 J. Surgery. 2014; 71:354–361. https://doi.org/10.1046/j.1440-1622.2001.02128.x
17. Hahn, GN. Reconstruction with Chrome, Coblalt Mesh implants. American J. of implantology. 2008;5–10.