

Clinical review of 26 patients, restoring and contouring the facial bone lost and symmetry by 4 different types of inert alloplastic material alternative to bone graft surgery

مراجعة سريرية الى ٢٦ مريضا، لاستعادة عظام الوجه باربعة أنواع مختلفة من مواد مصنعة خاملة بدل جراحة العظام

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ABSTRACT:

Bone graft surgery is the ideal treatment to restore the aesthetic contour of the lost bone in facial injuries; it is the treatment of choice. 26 patients being operated at our center, to restore the bones lost and the facial symmetry by different types of Alloplastic implant, the Proplast implant which a new modified inert alloplastic implant being used in 12 patients to construct the zygomatic bone, chin and nasal bones lost. The patients were in a poor general health and were medically contraindicated to bone graft surgery or refused such surgery. Post traumatic condylar hyperplasia is a rare condition (syndrome), causes facial asymmetry, together with malocclusion of the teeth. Mandibular osteotomies with bilateral sagittal and oblique sliding vertical ramus are a comprehensive surgical plan to restore the facial symmetry and normal occlusion. The Mandibular osteotomies are the treatment of choice in such cases. A new modified inert alloplastic acrylic subperiosteal implants been used in 8 patients, to restore the facial symmetry an alternativeto mandibular osteotomeis, in post traumatic condylar Hyperplasia patients. The acrylic implants were used for patients whowere medically contraindicated to mandibular osteotomies or for patients whom refused such surgery.

الخلاصة

جراحة العظام هي العلاج المثالي لاستعادة جمالية الوجه في اصابات الوجه. ٢٦ مريض اجريت لهم عمليات جراحية في مركزنا، لاستعادة العظام المفقودة في الوجه باربعة أنواع من المواد الخاملة واجريت عمليات جراحية الى ١٢ مريض لبناء العظام الوجنية والذقن وعظام الأنف كما اجريت ١٤ عملية جراحية بمواد اخر خاملة مختلفة لاستعادة تناسق الوجه. مراجعة سريرية لنجاح وفشل هذه المواد واسبابها

Keyword: Maxillofacial trauma, craniomaxillofacial trauma, Facial asymmetry, Condylar hyperplasia.

صدمة الوجه والفكين، القحف والفكين وصدمة الوجه، عدم تناسق الوجه، تضخم عنق الفك الاسفل

INTRODUCTION

Autogenous bone grafts to reconstruct and re-contour the lost facial bones are the ideal technique; the facial bone lost may be reconstructed and contoured by many types of bone grafts such as cancellous autograft, iliac crest bone graft, and costochondral graft (1).

The costochondral grafts offer several advantages, including biological and anatomical similarity, low morbidity of the donor site, easy obtaining and adapting the graft. The allograft (Proplast implant) (2) has been used, alternative to autograft, (substitute to bone graft), avoids donor site morbidity, demonstrates biocompatibility, presents no infection risk, (can be autoclaved), its supply is virtually limitless, and can be carved during surgery by scalpel to permit fitting the lost bone and soft tissues, it reduces the surgery time when restoring the aesthetic contour of the facial bones lost, in traffic accidents, shell and bullet injuries to the face. New modified Proplast implant which is designed especially for cosmetic restoration, is ultra-porous (70-90%) porous by volume, which ensures a rapid stabilization of the implant by tissue ingrowth, no need to be fixed to underlying bones. Facial asymmetry may be due to post-traumatic condylar hyperplasia. Hyperplasia which is increasing in the total number of the cells due to increased activity which exists only for so long as that activity or the stimulus is applied, when it is removed, the tissue returns to normal. A secondary structural alteration in the general architecture of the condylar hyperplasia due to an accompanying degeneration may render a complete return to normality impossible (3). Mandibular overgrowth asymmetry due to post-traumatic condylar hyperplasia were first described by Lund in Denmark 1974 in a cephalometric study of mandibular growth following condylar

fractures. Mandibular asymmetry following condylar injury is poorly documented as a cause of a facial asymmetry (4-7).

All patients who developed unilateral mandibular overgrowth secondary to condylar hyperplasia had history of trauma to the condyle, some patients had a clearly documented condylar fracture, but on the opposite side of the deformity. All patients were adults and the deformities had resulted from a non-fracture injury of the condyle (8-9). The prominent features of post traumatic condylar hyperplasia include enlarged mandibular condyle, elongated condylar neck, outward bowing and downward growth of the body and ramus of the mandible on the affected side, causing fullness of the face on that side and flattening of the face on the contralateral side with deviation of the chin (10). Fig

Figure 1. Facial asymmetry



METHOD AND MATERIAL

12 patients with primary complaint of facial asymmetry due to post traumatic condylar hyperplasia, who visited the outpatient department of the maxillo facial surgery been selected. A detailed history of the mode of onset and duration was recorded, any obvious facial asymmetry or deviation of the chin was examined. Routine hematological examinations were carried out on all patients pre-operatively.

The patients being operated through an extra oral approaches under general anesthesia with nasoendotracheal intubation. A new modified alloplastic acrylic implant being used to restore the symmetry of the face in 8 patients who were medically contraindicated to an extensive osteotomies surgery(11). An incision made at the lower border of the mandible (to avoid a visible scar)(12). Fig (2



Figure2. Patient under G.A



Figure3. A sub mandibular incision

By dissection a surgical tunnel has been 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 Fig (4).



Figure4. Acrylic alloplastic implant

The implant then inserted under the periosteum posterior to the second lower premolar (avoid the mental nerve) through the surgical tunnels created at the lateral surface of the mandible and the ascending ramus.

The implant then fixed by 0.5 mm stainless steel wire to lower border of the mandible, to prevent any possible movement of the acrylic implant (migration) which may change the post operative aesthetic appearance of the patients. Fig (5).



Figure5. The implant Introduced and fixed by 0.5 mm stainless steel wire

The wound closed in layers, systemic antibiotic given for five days postoperative as a prophylactic measure against infection.Fig(6).



Figure 6. Pre and post-operative pictures, show the final appearance of the patient with good aesthetic results

10 patients with a primary complaint of facial asymmetry due to loss of facial bones in facial injuries, been operated on using the new modified Proplast implant Fig (7& 8).



Figure 7.Problast block



Figure 8.Carved with Scalpel

A detailed history of the mode of onset and duration was recorded. Any obvious facial asymmetry, scar mark was examined. Routine, hematological examinations were carried out to all patients pre operatively. All patients being operated through extra oral approaches under general anesthesia with oral or nasoendotraacheal intubation. To construct the lost zygomatic bone, the Proplast been inserted through an extra oral approach by coronal incision (13,14)

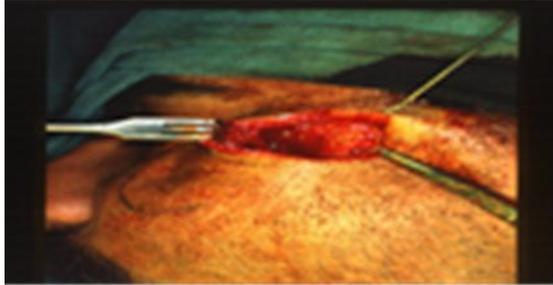


Figure 9. A coronal incision (retracted)

A dissection carried down the lateral orbital rim to the lower border of the zygomatic space just inferior to the orbital rim and angulated below the inferior orbital nerve close to the pyriform aperture (avoid perforation to the nasal cavity), and just above the upper sulcus (avoid perforation to the oral cavity), this create a surgical pocket large enough for the Proplast implant, to be inserted and give the required aesthetic contour of the zygomatic bone, the wound closed in layers without tension to avoid some resorption of the Proplast Fig (10&11).



Figure10.Problastinserted



Figure11. The incision was sutured

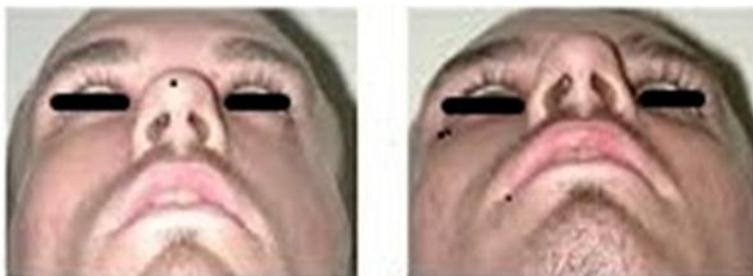


Figure 12. Pre and post operative appearance

To construct the nasal bones lost, the patient anesthetized with oral intubation. The Proplast implant inserted through a small incision in the scar tissue of the nose which already found due to the previous trauma Fig (13)



Figure 13. Pre operative view Figure 14. Post operative view

By a subcutaneous undermining, a pocket created large enough to accommodate the Proplast, the nasal mucosa kept intact without any perforation or damage (13). Pieces of Proplast inserted through the incision into the pocket enough to give the normal aesthetic appearance of the nose Fig (14), the wound closed by subcutaneous

resorbable suture and by a fine black silk to approximate the skin without tension.

To construct the chin lost by the Proplast implant, the Proplast implant inserted through a curved incision made through the skin and subcutaneous fat in the sub mental reign parallel to the inferior border of the symphysis to avoid a visible scar. Fig (15), the flap undermined and reflected in the outer aspects of the inferior border, the Mentalis muscle and the periosteum incised, the ready-made shaped chin Proplast then inserted into the subperiosteal pocket created over the symphysis to give a normal contour to the chin (16). Fig (16).



Figure 15.The incision



Figure 16.Problast introduced

For immediate post-operative stabilization of the implant a reasonable suture been used, the intact soft tissues in this area prevent slippage or movement of the implant (17,18), the wound closed in layers without tension Fig (17).



Figure 17. Pre and post operative view

DISCUSSION AND CONCLUSION

Mandibular Osteotomies with bilateral sagittal and oblique sliding vertical ramus are a comprehensive surgical plan to restore the facial symmetry, are the treatment choice in post traumatic condylar hyperplasia.

The new modified acrylic implant is used in 8 patients who were a medically contraindicated (to osteotomies surgery) to restore the facial symmetry, the acrylic implant found to give a good postoperative permanent facial symmetry result, It is less trauma to the patients than the osteotomies (13) and less time consuming to the surgeon, the malocclusion of the teeth than corrected by a conservative methods such as orthodontics, crown, and bridges or partial denture appliances.

The acrylic implant retains its shape, thickness and position (no migration), no resorption when submitted to pressure, the modified acrylic implant is light in weight not rejected by patient's tissue (inert material) it been used alternatively to mandibular osteotomies, found to give a good permanent aesthetic result as shown in table 1.

Table 1: Demographic data, cause, Treatment done and Clinical follow up result

No. of patients.	Age	Sex	Side	Causes	Treatment	Clinical follow up result
6	20-28	M	Rt& Lt	Post traumatic condylar hyperplasia	Acrylic implant	Good
2	23-26	F	Lt &Rt	Post traumatic condylar hyperplasia	Acrylic implant	Good
2	22-24	F	Lt &Rt	Post traumatic condylar hyperplasia	Problast implant	Non Satisfactory
2	25-28	M	Rt& Lt	Post traumatic condylar hyperplasia	Ceramic implant	Non Satisfactory

A modified alloplastic Proplast implant being used as an alternative to the bone graft in 12 patients whom were medically contraindicated to bone graft surgery or refused such surgery, it is found to give a good aesthetic appearance, than other implants such as Ceramics (19), Chrome Cobalt mesh (20). As shown in table 2.

Table 2: Demographic data, Causes, Treatment done and Clinical follow up results

No. of Patients	Age	Sex	Sites	Side	History	Treatment	Clinical follow up result
4 Patients	20,22,24,25	3M,1F	Zygomatic bone	Rt&Lt	Trauma	Proplast implant	Non satisfactory aesthetic
2 Patients	25,28	2M	Nasal bones	Rt& Lt	Trauma	Proplast implant	Goodaesthetic
4 Patients	20,25,32,50	4M	Chin	Mid Line	Trauma	Proplast implant	Goodaesthetic
2 Patient	31,40	2F	Zygoma	Rt&Lt	Pathological	Ceramics implant	Non Satisfactory
2 Patient	44,55	F,M	Lower border of the Mandible	Lt	Pathological	Chrome Cobalt Mash	Non Satisfactory

The Ceramics which are crystalline structures of inorganic non-metallic mineral salts produced in a high temperature, been used as a bone substitute in 4 patients found to have difficulties in fixation to the under lining bones with a major position migration post-operative

so it gave non satisfactory result. The Chrome Cobalt mesh being used as a mandibular prosthesis in 2 patients found to give non

satisfactory results because of its difficulties in adapting the mesh. The Proplast found to give a good aesthetic result in reconstructing facial bones which are not submitted to external pressure such as the chin and nasal bones. The crushing strength of the Proplast is low; it resorps when submitted to pressure. The Proplast implant found to lose about 60% of its volume during the five years follow up due to pressure on the constructed Zygoma during sleep, the constructed Zygoma by the Proplast implant, found to be non-satisfactory for the 5 years follow up period.

POSTOPERATIVE FOLLOW UP

The Proplast is a radiolucent material, post-operative X rays show nothing of the Proplast implant, the preoperative and the post-operative X rays, look the same.

Five years post-operative (clinical) follow up of the patients treated with a Proplast implants, showed a 95% success for the Proplast implant (only 5% position migration), the patients being followed up regularly for a period of five years, the aesthetic result found to be good, regarding the chin and nasal bones.

The acrylic is a radiolucent material, post operative X-ray of the mandible show nothing of the alloplastic acrylic material. Regular five years post operative (clinical) follow up study of the patients treated by the acrylic implant showed that the acrylic implant gives a good permanent symmetry of the face.

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