Correction of nonsyndromic facial asymmetry  

Suresh Vyloppilli, BennyJoseph, Nithin Kumar, Anoop Anirudhan

ABSTRACT
Hemifacialatopy presents a challenge for reconstructive surgeons. This paper reports the management of a 24-year-old male patient, having nonsyndromic facial asymmetry as a result of condylar hypoplasia, using porous high-density polyethylene (pHDPE) facial implant and sliding genioplasty. Augmentation with porous high-density polyethylene implant material combined with an orthognathic surgical procedure produced excellent surgical results.

Keywords: Facial Asymmetry; Implant; Porous High-Density Polyethylene; Sliding Genioplasty

Introduction
Facial hypoplasia’s often require augmentation procedures which include advancement orthognathic surgeries, distraction osteogenesis or by using different types of grafts. Most of the facial deformities need complex surgical procedures with prolonged treatment time and considerable surgical morbidity. Many at these times these defects can be corrected or camouflaged with onlay grafts. The preferred graft materials are either autogenous grafts or alloplastic materials. Autogenous bone grafts possess the problems of additional donor site morbidity, graft resorption and therefore unpredictable results. Porous high density polyethylene (Bio pore) is a comparatively new alloplastic material with definite edge over many of the graft materials. Augmentation with pHDPE is a simple, easy to master technique with predictable results. This augmentation procedure can be combined with other orthognathic surgical procedures for a more acceptable aesthetic result. Genioplasty is the simplest among them. This paper reports the management of a 24-year-old male patient, having nonsyndromic facial asymmetry as a result of condylar hypoplasia, using porous high-density polyethylene facial implant and sliding genioplasty.

Case Report
A 24-year-old male patient reported to our maxillofacial unit with the complaint of deformity of the right side of face since childhood (Figure 1). Patient had undergone orthodontic correction of the teeth. Clinical and radiographic examination revealed right condylar hypoplasia with the resultant short ramus with reduced body height of mandible, prominent antitragal notch and deviation of the chin to the right side. Because the patient had satisfactory occlusion and a functionally stable condyle and the defect was of moderate degree, augmentation of the defect with pHDPE and a sliding genioplasty was planned.

Surgical Procedure: Conventional genioplasty incision was made to expose the chin region and isolating the mental nerves. There was a discrepancy of 9mm between the chin and the dental midlines, which were marked on the bone. Osteotomy was done 7mm apical to the anterior teeth. After completion of the osteotomy chin was slide to the left side to coincide the dental midline with the chin midline. Osteotomised segment was then fixed in such a way that a gap of 4mm was kept in the right side to compensate the vertical shortening in the anterior region of the mandible (Figure 2).

Incision on the right posterior region extended from anterior border of the ramus along the external oblique ridge to the mesial side of the first molar. Tissue was reflected subperiosteally beyond the posterior and inferior border of the mandible. Pterygomasseteric sling was also detached. pHDPE was then placed subperiosteally and fixed with two titanium 2mm diameter, 8mm length monocortical screws (Figure 3). Incision was then closed with 3-0 vicryl sutures.

Discussion
Different types of alloplastic materials are commercially available for reconstruction or augmentation of the tissue defects. The major advantages of alloplastic material being avoidance of additional donor site surgery and predictable results. pHDPE is made from linear high density polyethylene. It is bio inert, biocompatible and bio integrated. The interconnecting non-bridging porous structure allows tissue ingrowth and bio integration. The pore size is larger than 100 micrometers and a pore volume in the 40-50% range. pHDPE is light weight and can be easily cut, molded or reshaped during surgery. The firm nature of the implant allows the surgeon to carve or shape the implant without the risk of bone collapse. It shows excellent molding properties in hot water at 100 degree centigrade. It can be easily cut and shaped with scalpel, surgical scissors or bone cutters. The implants are available in various sizes and shapes suitable for reconstruction and augmentation of different regions in the craniofacial areas. It can be easily fixed to the implanted site with sutures or with screws. In vitro and in vivo biocompatibility studies show it is free from any observable cytotoxic effects. The surgical procedure for the implant placement is simple and easy to make. The results are good, sustainable and predictable. Post-surgical morbidity and complications are minimal. The porous nature of the implants increases the risk of infection. Therefore a high aseptic procedure should be carried out. Possible complications are minor and our patient had mild paraesthesia of the lip, which was resolved in one month. Overall the result was fairly good (Figure 4).

Conclusion
pHDPE is a reliable alloplastic implant for augmentation or reconstruction of tissue defects. It is easy to place and fix the tissue defect. The porous nature allows the natural tissue ingrowth and thereby makes the graft bio integrated and thus becomes a part of the body. Though there were no major complications associated with the implant placement long-term studies are required to confirm its edge over the other graft materials. This paper reports the management of a 24-year-old male patient, having nonsyndromic facial asymmetry as a result of condylar hypoplasia, using porous high-density polyethylene facial implant and sliding genioplasty for correction of moderate facial asymmetry, it produces excellent result.

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Case Report Figure 1. Preoperative frontal profile showing facial asymmetry. Figure 2. pHDPE implant fixed with two titanium monocortical screws. Figure 3. Sliding genioplasty after fixation. Figure 4. Postoperative frontal profile with near normal appearance.