Abstract: Depressed frontal bone fractures result in contour deformity when primary correction has not been done. Secondary correction of such deformities pose difficulties in reconstruction. Some of the options for the correction are use of onlay grafts with autogenous or alloplastic material or mobilisation of the depressed bone by osteotomies and fixation. Here is a case report of depressed frontal bone deformity correction done with the use of hydroxyapatite as bone graft substitute.

Keyword: Alloplasts, depressed frontal deformity, hydroxyapatite.

INTRODUCTION: Contour deformities of the orbitocranial region are common following high velocity trauma. Use of autogenous onlay bone grafts are associated with donor site morbidity and are known for resorption. Use of alloplast material include hydroxyapatite cement/block/ granules, carbonated calcium phosphate cement, high density porous polyethylene implants and acrylic (methylmethacrylate). We have used hydroxyapatite granules as a bone graft substitute for the correction of post traumatic frontal bone deformity.

CASE REPORT: 20 years old male presented to the department with deformity of the forehead of 5 months duration. He sustained injury to the face in a road traffic accident 5 months back and was treated elsewhere. He underwent primary suturing of right eyebrow laceration. Patient had history of CSF rhinorrhoea following the injury which subsided after 10 days. On examination he had depressed contour deformity involving the right supra-orbital margin.
frontal region and root of the nose. Irregular, flat, hypopigmented scar was extending from the right supraorbital margin across the glabella to the left upper eyelid. He had mild enophthalmos of right eye, minimal increase in the interpupillary distance and hypoesthesia in the right supraorbital region. Computerized tomography of the facial bones with 3D reconstruction was carried out which revealed depressed fracture of the right frontal bone. Facial mask was made to assess the amount of augmentation needed. Patient requested for correction of the depressed deformity. (fig. 1 & fig. 2)

Surgical procedure was carried out under general anaesthesia to correct the deformity. Through a bicoronal approach, subperiosteal dissection done near the fracture site to expose the fracture. The depressed deformity involving the right supra-orbital and frontal region was augmented with porous hydroxyapatite granules which was (prepared as per the manufacturers guidelines) made as a paste by mixing it with normal saline and wrapped with surgicel and was used to fill the defect with some overcorrection. (fig. 3, fig. 4 & fig. 5).
Through the same approach a pocket was created in the root of the nose. Osteotomy was done with small stab incision on either side of the nose and the fractured nasal bones were repositioned. Dorsal augmentation was done with costal cartilage graft harvested from the right chest wall, which was contoured and then inserted into the pocket. The periosteum was sutured as far as it could allow over the bone cement. The bicoronal incision was closed in layers. Post-operative period was uneventful (fig. 6, fig. 7 & fig. 8).
Discussion:
Augmentation of the depressed craniofacial skeleton is most often required in patients following craniofacial trauma. Recontouring of the craniofacial defects poses a great challenge to reconstructive surgeon. Various autografts and alloplast materials are in use and each have their own merits and demerits. Autogenous bone graft is associated with donor site morbidity, and is known for resorption. Titanium mesh is costly and it's shaping and contouring is difficult. Methylmethacrylate offers the advantage in that it is inert but it needs to be fixed to prevent migration and offers only little new bone formation. Infection and extrusion is a known complication. Hydroxyapatite is a synthetic bone graft substitute made by the conversion of the calcium carbonate exoskeleton of sea coral and is available in block and granule forms. Its porous nature acts as a scaffold for osseous ingrowth with bony union seen as early as 90 days after implantation. Porous hydroxyapatite offers the advantage in that it retains its volume and is partially osseointegrated, extensive but not complete bone ingrowth takes place from the viable periosteum.

Advantages:
It offers the advantage of overcorrection. Contouring of the graft to fill the defect. No donor site morbidity. Cost effective and offers a short operative time.

Disadvantages Variable osseointegration.
Follow up period: We have followed up the patient for 2 months following the procedure.

References: