Introduction
Maxillofacial surgery deals with major surgery of jaw bone tumour, oral cancers, temporomandibular joint, congenital facial defects, jaw bone fracture etc. This branch of surgery has come up more recently with advanced surgical technique and bone grafting has become a regular job for maxillofacial surgeons in the reconstruction of acquired or congenital jaw defect. The term grafts applies to the transplantation of living tissues and implant means transplantation of non viable tissues. Besides microvascular flap with bone may be grafted anastomosing with vessels. Numerous attempts have been made for long time to employ these procedures in the reconstruction of jaw after oncological surgery, destruction of a bone by accident, congenital defects, in the treatment of jaw deformity, TM joint abnormalities. Various types of bone grafts, such as xenogenic bone grafts, autogenic bone grafts, allogenic bone have been successfully transplanted time to time by some authors. However the success of bone grafting is still a challenging issue in the maxillofacial surgery.

Types of grafts and implants
Grafts and implant substances are classified according to their immunological basis:
1) Autogenous bone grafts or Autograft is composed of tissue taken from the same individual or from the host himself,
2) Allogenic bone graft composed of tissue taken from an individual of the same species who is not genetically related to the patient,
3) Isogenic bone graft or Isograft or Homograft or Syngenesioplastic graft where tissue is taken from an individual of the same species who is genetically related to the patient,
4) Heterografts or Xenogenic graft means tissue taken from a donor of another species eg. animal bone grafts to man cortical bone cancellous bone or mixed cortical cancellous slabs may be used. Such grafts can be applied as chips, flakes or shaped blocks.

More recently, facial or dental implants has become very popular. These implants are mostly made of titanium with a coating of calcium hydroxy appetite.

Conditions for success in bone grafting
There are certain factors which are very important to achieve, successful bone grafting. Poor nutritional condition, improper stabilization of bone may affect the success of bone grafting. Besides absence of infection is essential to prevent the graft become infected before it has been revascularised and to constitute sequestrum. For this reason bone grafts can be inserted through skin incision rather than the mucous membrane of the mouth avoidance of wound contamination and antibiotic therapy. So the tissue should be free from infection, healthy and vascular.

The recipient site should have an adequate blood supply to ensure rapid invasion of the graft by granulation tissue and its adequate nourishment, otherwise the graft will fail. So, greatel the proportion of cortical to cancellous bone, the more vasucal must be the graft bed to ensure success. Besides an adequate area of contact between graft and bone end is an important factor. A good broad contact between the graft and recipient bone is essential for union of the graft. Ideally of the bone ends should be held firmly for immobilization together without movement until union occur. In Bangladesh, there are not
enough scope for excellent stabilization of grafted bone using titanium mini plate and lack of excellent OT surgical atmosphere which may also ultimately affect the fate of bone grafting.

**Autogenous grafts**

Autogenous bone graft is mostly used graft in Maxillofacial Surgery. The optimal bone graft material should be autogenous in origin because autogenous bone is a superior graft material and in general autogenous bone grafting procedure in the most successful type of procedure. Autogenous grafts are usually employed to restore large area of lost bone following oncological surgery or traumatically avulsed or the surgically resected bone. Some surgeons have preferred to use rib grafts and others have preferred to take solid, one piece graft from the iliac crest and fabricating the transplant to the desired shape.

Experimental studies have demonstrated the marked osteogenic potential of haemopoietic marrow. So marrow with accompanying cancellous bone can be transplanted autogenously to new bone formation in various types of osseous defects. This type of graft material is capable of actively inducting osteogenesis. This autogenous particulate marrow cancellous bone (PMCB) grafting have several advantages over solid one piece autograft. It can be obtained easily by making only a small opening along the lateral surface of the crest rather than taking a large portion of the ileum, and complete healing is more rapid. But the impediments are the lack of development of a satisfactory method of containing the graft within the surgical site and pre-venting the in growth with fibrous tissue which has a tendency to insinuate between the individual particles of the graft material, produce a fibrous union. A recent application of the PMCB grafting principle to the treatment of deficient edentulous mandibular and also maxillary ridge has been the combination of marrow cancellous bone graft with a subperiosteal metal implant used for the attachment of semiburied posts for subsequent implant denture construction.

However, the problem have been associated with autogenous bone grafting use post-operative sequelae of infection, exfoliation and sequestration, varying rates of healing, root resorption and rapid recurrence of the defects.
Review Article

Autogenous bone graft is widely used in Bangladesh. Maxillofacial surgeon often uses bone from iliac, rib, tibia or cranial bone with a variable success rate.

**Allogenic grafts**

Tissue Bank has been formed in recent years in Dhaka and providing limited scope of using allogenic graft mostly for general orthopedic surgery. Obtaining donor materials for autograft poses necessities inflicting surgical trauma of another part of the body of the patient. Obviously it would be to the patients as well as the therapist’s advantage, if a suitable substitute could be utilized for grafting purpose that would offer similar potential for repair and not require the additional surgical removal of donor material from the patient. But allografts are foreign to the host and therefore have the potential to provoke immune response and immunosuppression is essential. Attempts have been made to suppress the antigenic potential by radiation, freezing and chemical treatments.

Allogenic bones can be treated by physical or chemical agents. Banking of allogenic bone by cryobiological methods by use of cooling, freezing or freeze-drying can be done and they can be prepared in various anatomical forms to the needs of different oral surgical procedures.

Cryobiologically present bone Implant do not survive, so the assistance on the part of implanted material to osteogenic process of the host is purely passive. Such transplanted of the host grow to reconstruct at the host defect. They are more completely revascularized, resorbed and remodelled than the allogenic bone grafts that have been deproteinized, boiled or authorized drastically treated. The relatively large personnel requirements necessary for the performance of aseptic autopsies and the processing and storing of bone product are essential here.

The remodelling rate of allogenic bone graft is slow and it permits the graft to maintain the desired contour for longer period postoperatively. But a slight trauma could completely dislodge the graft from the host bone leading to sequestration of the graft and failure of the procedure. If the surrounding musculature is conducive to good revascularization of the host bone and the graft recipient site is an optimal one, the desired surgical result will be obtained readily. Banked allogenic graft may be subjected to various surface decalcification procedures as well as enzymatic treatment. The purpose is to render the surface of the graft more amenable to remodelling and eventual replacement of new host bone. By this process the rate of resorption and remodelling of the surface altered matrix of the osseous implant will be increased. Completely decalcified allogenic bone can be used in situation in which normal regeneration has been assisted by the implant or in which osteogenic potential of the growing bone in young individuals has been a major factor in the bone regeneration of a favourable graft recipient site. In maxillofacial surgery, allogenic bone crystals are being used in cyst cavity after enucleation or in stabilizing teeth, with variable results.

**Composite grafts**

a) Composite autogenous hard and soft tissue grafts: Recent improvement in technique of microvascular surgery with improved surgical optics has made possible the restoration of lost bone and concomitant soft tissues. These are known as composite because they contain both hard tissue i.e.bony structure and accompanying soft tissue mass usually muscle and accompanying skin. The grafts are either taken from the chest wall and contain the autogenous rib with the blood vessels intact or from the iliac crest with superior iliac circumflex artery attached. Here the arterial system is anastomosed on the tissue transfer to the lost bone. Venous system are also
anastomosed if available. But here the islands of grafted bone in the centre of the soft tissue mass frequently doesn't undergo complete vascularization. Microvascular flap or grafting is still not well established in Bangladesh. It needs special skill and expensive equipments.

b) Composite alloplast and allograft: This type involves autogenous bone tissue and alloplastic material such as metal. Here the metal is not only surrounded the particular grafts but actually sit in the centre of the graft. The purpose of the metal is to serve as attachments for subsequent implant denture posts after the graft has sufficiently remodelled and matured.

c) Composite allograft and autograft: Research studies indicate that a promising graft material may be the combination of acceptably preserved allogenic bone and autogenic bone. The use of surface decalcified allogenic bone combined with auto-genous PMCB has produced and acceptable composite graft material. The advantage are the amount of autogenous tissue may be reduced to a minimum to regenerate a given area of lost bone, and a lessening of post operative morbidity.

Homograft
It is very much similar to autograft. An immune response will be elicited by the graft and vast majority of the original cells with- in the graft die. Then there will be invasion of the cancellous bone spaces by granulation tissue and necrotic soft tissue is removed. Here the calcified matrix of the graft will not be destroyed by the host's response. Further more, this matrix is capable of exerting an inductive influence on the invading granulation tissue resulting in osteogenesis.

Xenograft
In Bangladesh oral surgeons have started using bone crystals of bovine source to strengthen loose teeth. However the ultimate success of the xenograft remain unpredictable.

Calf bone (Bopplant), treated by detergent extraction, sterilized and freeze dried, has been used for the treatment of osseous defects. Kiel bone is calf or ox bone denaturated with 20% H2O2, dried with acetone and sterilized with ethylene oxide. Anorganic bone is ox bone from which the organic material has been extracted by means of ethylene diamine, it is then sterilized by autoclaving. These materials have been tried and discarded because following a first transfer of tissue there is initial acceptance followed by rejection within a few days by acute inflammatory reaction. If a second same transplant is done it will be rejected more rapidly.

Conclusion
Autogenous bone grafts taken from iliac crest or ribs have become a common practice to reconstruct mandible, maxilla, nasal bridge, TM joint with variable degree of success. Microvascular surgery using soft tissue and bone anastomosing with vessels may be a better method, however, it needs special skills & expensive equipment.

Reference