Case Report

Mandibular Ridge Augmentation Using OraGraft® Mineralized Ilium Block

Prof. Gianluca Sfasciotti
Università Roma La Sapienza
Dipartimento di Scienze Odontostomatologiche e Maxillo Facciali
Roma

BACKGROUND
Several dental procedures address implant placement in partially or totally edentulate patients. Problems associated with implantation in these patients often arise due to limited bone height or width of the mandible. In such cases, mandibular augmentation is required before implantation can take place. Other regeneration techniques, such as guided bone regeneration (GBR), also exist for these bone defects. Some techniques focus on ridge augmentation prior to implant placement while others simultaneously perform both procedures.

When anatomy dictates, an alternative method of treatment used in ridge augmentations involves a mineralized ilium block, which has demonstrated application in a variety of specialties, including orthopedics, neurosurgery, and craniomaxillofacial. These block allografts have been demonstrated to support missing bone structure and remodel in time via normal regenerative pathways. One particular human ilium block allograft, OraGraft®, is uniquely prepared using Allowash XG® technology to provide medical grade sterility and freeze-dried to allow storage at ambient temperatures.

The following case presentation involves mandibular ridge augmentation using a mineralized ilium block allograft, OraGraft.

CASE DESCRIPTION
Surgical Notes
A pre-operative dental scan of the patient with template diagnostics was taken showing considerable atrophy of the lower jaw symphysis in the area from 3.5 to 4.4 (20 to 28 Universal) (Figures 1 & 2).

Figure 1: Pre-operative template scan
Figure 2: Atrophy of lower jaw
Full thickness dissection and grafting of the atrophic area was performed using three mineralized human ilium block allografts, OraGraft (LifeNet Health, Virginia Beach, VA) (Figures 3 & 4). Ilium block grafts are unique in that they possess a cortical exterior with a cancellous center (Figure 5). The cancellous portion is easily trimmed and placed against the prepared surgical bed. Corners were smoothed and gaps between the block and the surgical bed were filled with particulate material and a resorbable membrane to cover the grafted area. Little change in the shape of the block grafts was demonstrated over time. A screw was purposely left in one of the grafts to monitor graft resorption.
HISTOLOGY
The specimen was serial sectioned and all slides were stained with hematoxylin and eosin. With few exceptions, all the slides were similar and composed primarily of variable sized bony trabeculae. Graft bone is identified by enucleated lacunae. Host bone, which predominates, is composed of well nucleated lacunae. Lamellar and woven bone are identified. Some sections show new bone deposited on graft bone. Some of the graft bones also contain newly formed well vascularized osteons.

Inter-trabecular spaces vary in size and shape and contain stromal cells embedded in a loose connective tissue matrix. Neo-vascularization is prominent. Mature adipocytes are seen juxtaposed to osteoblasts.

Figure 8: Section #41 clearly shows retained pin and the presence of a maturing cortical plate and cancellous bone within the alveolar ridge

Figure 9: Core taken for histologic study at 10 months. Excellent healing obvious with adequate space for dental implantation
The picture is of exuberant new bone growth with evidence of graft bone acceptance. There is not any significant inflammatory, reactive or other pathologic process present.

**DISCUSSION**

While many options exist for horizontal augmentation of an atrophic mandibular ridge, each varies in technical expertise needed and outcome predictability. It is paramount that early intervention occurs while an edentulous area is resorbing in order to make any correction prior to loss of vertical height. This provides the clinician with more implant options and thus a better clinical outcome.

The case illustrated here provides a good example of an available treatment option that can be readily performed by an implantologist and provides a predictable and stable base, even at 3 months, for implant therapy and subsequent dental restoration.

Figure 10: A) 5x magnification showing interface between native bone and allograft B) 10x magnification showing interface between native bone and allograft C) 5x magnification showing active bone marrow development D) 10x magnification showing new bone surround implant spicule E) 10x magnification showing neo-vascularization and allograft interface
References


LifeNet Health
1-888-847-7831
1864 Concert Drive 1-757-464-4761 ext. 2000