بسم الله الرحمن الرحيم

Block versus particulate autogenous bone graft in maxillary alveolar ridge augmentation.

(A Clinical Study)

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ABBM	Anorganic bovine bone mineral
ABG	Autogenous bone graft
ASA	American Society of Anesthesiologists
BMP	Bone morphogenic protein
DO	Distraction osteogenesis
EC	Endochondral
e-PTFE	expanded-polytetrafluoroethylene
GBR	Guided bone regeneration
GTR	Guided tissue regeneration
IM	Intra-membranous
PMCB	Particulate marrow cancellous bone
P-value	Probability value
SD	Standard deviation
Ti-mesh	Titanium mesh

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Introduction

One of the main diagnostic factors in patient evaluation for the placement of dental implants is the available bone at the desired implant location. Insertion of an endosseous implant requires sufficient bone volume for complete bone coverage. Based on clinical experience, the minimum required dimensions of bone include a ridge width of 5 mm, allowing for bone on the facial and lingual aspects of the implant and a vertical bone height of 10 mm. **(Misch, 1990).**

The reconstruction of the compromised maxilla for conventional implant placement has became a challenging aspect in oral rehabilitation. In patients with advanced maxillary ridge atrophy, reduction of the residual bone height results in a lack of primary stabilization of implants installed by conventional methods. Numerous bone grafting techniques with and without immediate implants placement have been used in such cases **(Boyne 1992).**

Bony defects in the cranio-maxillofacial skeleton may arise as a result of congenital areas of failed development such as cleft palate, the results of ablative surgery in which segments of bones are resected to treat cysts or tumors, and due to trauma in which case osseous tissue may have been traumatically avulsed **(Peterson, 1983).**

Several augmentation techniques have been proposed, even in cases with limited bone support and inadequate nourishment. Before the establishment of dental implants useage, numerous surgical techniques were developed to improve the foundation for prosthetic rehabilitation

(Jennings, 1989). These techniques included; sulcoplasties **(Hillerup, 1994),** Shortening of the narrow alveolar ridge until reaching the required width **(Watzek 1996)** and various grafting procedures **(Lekkas and Wes, 1981; Peterson, 1983).** Only temporary improvement of dentures retention and stability were achieved **(Stoelinga et al.,1986).**

Since the introduction of the concept of osseointegration in 1982, dental implants have proven to be a reliable treatment for fixed and removable prostheses. The scope of reconstructive preprosthetic surgery has changed from providing adequate osseous and mucosal support for a conventional denture to providing sufficient bone volume allowing implant insertion into the best prosthetic position **(Stellingsma et al., 2004).**

Autogenous bone grafts or bone substitutes have been used to augment the alveolar ridge. The use of autogenous bone grafts for ridge augmentation is, on the other hand, recommended by most authors, due to the intrinsic osteogenic properties. However, the augmentation of the alveolar ridge by the use of fixed or non-fixed onlay bone grafts often results in partial or complete resorption of the graft and lack of bony union between the graft and the recipient site **(Jensen et al. 1994).**

Clinically, when an extraoral site is employed, the large availability of bone does not put the operator into the necessity of protecting the graft, since whenever achievable, over contouring is the most common way to deal with the expected resorption of grafted bone **(Chiapasco et al. 1999; Jakse et al. 2001).** The situation is completely different in

case of intraoral harvesting, where bone is available in more limited quantities **(Montazem et al 2000).**

Autogenous bone can be grafted in the form of block or particulate form. An autogenous particulate bone graft heals by immediate and continuous bone formation that results in a larger and more rapidly consolidated graft. Autogenous onlay block grafts may resorb more rapidly and usually do take a longer time to integrate than autogenous particulate bone grafts **(Boyne et al. 1997).**

One of the disadvantages of the use of particulate grafts is the lack of structural integrity. Without a containment system, soft tissue collapse can result in compression or displacement of the graft and inability to achieve the desired results **(Buser et al. 1996; Donos et al. 2002) .**

Porous titanium mesh has been previously reported as a containment system for particulate grafts used in the augmentation of the maxilla and mandible **(Schopper 2001).**