The use of Nano graft combined with leukocyte-platelet rich fibrin in ridge preservation

(A Randomized controlled Clinical and Histological study)

Thesis submitted in partial fulfillment of the requirements of

The master degree of periodontology

By

Mazen Mostafa Sayed

B.D.S 2009

Faculty of dentistry, Ain Shams University

2020

SUPERVISORS

1. Prof. Dr. Ahmed Youssef Gamal

PROFESSOR OF ORAL MEDICINE, PERIODONTOLOGY, AND ORAL DIAGNOSIS, FACULTY OF DENTISTRY, AIN SHAMS UNIVERSITY
DEAN OF FACULTY OF DENTISTRY, El NAHDA UNIVERSITY

2. Dr. Waleed Mohamed Abbas

LECTURER OF ORAL MEDICINE, PERIODONTOLOGY, AND ORAL DIAGNOSIS, FACULTY OF DENTISTRY, AIN SHAMS UNIVERSITY

List of Contents

List of tables

List of Figures

List of Abbreviations

Abb.	Full term

ARP……Alveolar Ridge Preservation

CaP……..Calcium Phosphate

HA……..Hydroxyapatite

PC……Platelet Concentrates

ASP……..Alveolar Socket Preservation

BSM……..Bone Substitute Material

GBR……..Guided Bone Regeneration

BMPs.....Bone Morphogenic Proteins

TGF……Transforming Growth Factor

PDGF……Platelet Derived Growth Factor

EGF……Endothelial Growth Factor

IGF……Insulin –Like Growth Factor

FGF……Fibroblast Growth Factor

FDBA……Freeze Dried Bone Allograft

DFDBA……Demineralised Freeze Dried Bone Allograft

BCP……..Biphasic Calcium Phosphate

TCP……..Tricalcium Phosphate

CPC……Calcium Phosphate Bioceramics

SHA……synthetic Hydroxyapatite

POP……Plaster Of Paris

PMMA…….Polymethyle Methacrylate

PLA……Polylactide

PGA……..Polyglycolide

NHA……Nanocrystalline Hydroxyapatite

PRP……..Platelet Rich Plasma

PRF……..Platelet Rich Fibrin

EMD…….. Emdogain

GF……Growth Factor

cPRP……..concenterated Platelet Rich Plsma

L-PRF……Leukocyte and Platelet Rich Fibrin

A-PRF……Advanced Platelet Rich Fibrin

GTR……..Guided Tissue Regeneration

NBR…….Natural Bone Regeneration

VEGF……..Vascular Endothelial Growth Factor

TSP……..Thrombospondin

IL……..Interleukins

TNF……..Tumor Necrosis Factor

RBCs……Red Blood cells

RCT……..Randomized Clinical Trial

FDA……Food and Drug Administration

RCF……Relative Centrifugal Force

CBCT……Cone Beam Computed Tomography

CT……..Computed Tomography

HIV……Human Immunodeficiency Virus

3D……3 Dimensions

INTRODUCTION

Tooth extraction is one of the most widely performed procedures in dentistry. It has been historically well documented that this may induce significant dimensional changes of the alveolar ridge ***(Horowitz et al., 2012).***

Horizontal buccal bone resorption has been shown to reach as much as 56%, lingual bone resorption has been reported to be up to 30%, and the overall reduction in width of the horizontal ridge has been reported to reach up to 50%.With this horizontal ridge resorption, the alveolar housing assumes a more lingual/palatal position, with possible negative effects on esthetics, phonetics, and function ***(Schropp et al., 2003, Botticelli et al., 2004).***

Although the bone resorption continues over time, the most statistically significant loss of tissue contour occurs during the first month after tooth extraction and can average up to 3 to 5 mm in width by 6 months ***(Nevins et al., 2006).*** Resorption is affected by multiple factors, like depth of the extraction socket, mucosa thickness, metabolic factors, and functional loading. Preventing these factors alone does not sufficiently help to stop ridge resorption. Therefore, further techniques are necessary ***(Maxmillian et al., 2015)***.

As implants serve as an aid for prosthetic devices, they need to be placed in a 3-dimensionally perfect location to achieve the appropriate esthetic, phonetic, and functional demands of the patient. This is particularly important in the esthetic zone where the gracile natural contours of the periodontium are quite evident and their absence can be devastating ***(Buser et al., 2004).***

To optimize implant positioning, placement of grafting materials has been advocated as either a combined procedure with a barrier membrane or in some instances with a barrier membrane alone to help to stabilize the blood clot ***(Nevins et al., 1992).***

Alveolar ridge preservation (ARP) is defined as the procedure of arresting or minimizing the alveolar ridge resorption following tooth extraction for future prosthodontic treatment including placement of dental implants ***(Atieh et al., 2015)***.

ARP techniques include the use of grafting materials of human, animal or synthetic origin, with or without the use of barrier membranes, to further optimize the functional and aesthetic restoration of dental implant. The grafting materials include: particulate autogenous chips ***(Araujo, 2011)***, allografts ***(Iasella et al., 2003)***, xenografts ***(Araujo et al., 2010)***, and alloplasts ***(Norton, 2002)***.