

**GINGIVAL CREVICULAR FLUID LEVEL OF BONE
MORPHOGENIC PROTEIN - 2 USING MINIMAL INVASIVE
APPROACH VERSUS CONVENTIONAL APPROACH IN
TREATMENT OF INTRA BONY DEFECT**

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By

Zainab Hafez Abdel Rahman

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Supervisors

Dr. Khaled Atef Abdel Ghaffar

Dean of Faculty of Dentistry Ain Shams University

Professor of Oral Medicine, Periodontology, Oral Diagnosis and
Radiology

Faculty of Dentistry

Ain Shams University

Dr. Mohamed Sherif El Mofty

Assistant Professor of Oral Medicine, Periodontology, Oral Diagnosis and
Radiology

Faculty of Dentistry

Ain Shams University

Dedication

To my Dad and Uncle

Dad you had a dream 23 years ago and I'm happy to tell you I have fulfilled it.

My dearest Uncle you were the father who raised me and saw every single tear and laugh, you will always be missed.

Mum you are everything in my life, words to describe you don't exist, I'm who I'm because of you and loving you won't stop even with my last heart beat may god bless you

My dearest brother, I love you

My aunt your love and kindness guided me through out everything in my life

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List of Abbreviations

1. AA= Ascorbic acid.
2. ActR II = Activin receptor II
3. ActR II B = Activin receptor II B
4. ALK 3= Activin receptor like kinase -3
5. ALK 6= Activin receptor like kinase-6
6. ALP = alkaline phosphatase
7. ANOVA= Analysis of variance.
8. BMDX = Bone mineral derived xenograft
9. BMP = Bone morphogenetic protein
- 10.BMPR II = Bone morphogenetic protein type II receptor
- 11.BMPR IA = = Bone morphogenetic protein type I A receptor
- 12.BPBM = Bovine porous bone material.
- 13.BSP = Bone sialoprotein.
- 14.CaCo3 = Calcium Carbonate
- 15.CAL = Clinical attachment level
- 16.Cbfa1 = Core binding factor α 1
- 17.CNS = Central nervous system
- 18.Cox2 = Cyclooxygenase 2
- 19.DFDBA = Dimeneralized freeze dried bone allograft
- 20.DNA = Deoxyribonucleic acid
- 21.d – PTFE = Dense polytetrafluroethylene
- 22.ECM = Extra cellular matrix
- 23.EDTA = Ethylene diaminetetra acetic acid
- 24.EMD = Enamel matrix derivatives
- 25.ENAP = Excisionl new attachment procedure
- 26.e – PTFE = Expanded polytetrafluroethylene
- 27.FDBA = Freeze dried bone allograft
- 28.FGf4 = Fibroblast growth factor 4
- 29.GCF = Gingival crevicular fluid
- 30.GBR = Guided Bone regeneration

- 31.GTR = Guided Tissue regeneration
- 32.HA = Hydroxyapatite
- 33.IGF 1= Insulin growth factor 1
- 34. IL 1 β = Interleukin 1 β
- 35.IL 1R α = Interleukin 1 α receptor
- 36.IL 4= Interleukin 4
- 37.IL 6= Interleukin 6
- 38.MAPK= Mitogen activated protein kinases
- 39.MCAF= Modified Coronally positioned advanced flap
- 40.M-CSF= Macrophage Colony Stimulating factor
- 41. M= Mean
- 42.MF= Metformin
- 43.Min= Minute
- 44.MIS= Minimal invasive surgery
- 45.MIST= Minimal invasive surgery technique
- 46.M-MIST= Modified Minimal invasive surgery technique
- 47.MPPT= Modified Papilla Preservation technique
- 48.mRNA= Messenger Ribonucleic acid
- 49.OCL= Osteoclast like multinucleated cell
- 50.OCN= Osteocalcin
- 51.ODF= Osteoclast differentiation factor
- 52.OFD= Open flap debridement
- 53.OP= Osteoprotegerin
- 54.P-15= Cell binding peptide
- 55.PCL=Poly ϵ caprolactone
- 56.PD= Probing Depth
- 57.PDGF= Platelet Derived Growth factor
- 58.PDL= Periodontal ligament
- 59.P-ERK= Phosphorylated Extracellular signal Regulated protein
Kinase
- 60.PGA= Polyglycolic Acid
- 61.PGE2= Prostaglandin E2

- 62.PHEMA= Polyhydroxyl ethylmethacrylate
- 63.PI= Plaque Index
- 64.PLA= Polylactic acid
- 65.PMMA= Polymethylmethacrylate
- 66.PRF= Platelet Rich Fibrin
- 67.PRP= Platelet Rich Plasma
- 68.RANK-L= Receptor activator of nuclear factor kappa B ligand
- 69.RBCs= Red Blood cells
- 70.RCT= Randomized Clinical trial
- 71.Rpm= Revolution per minute
- 72. SD= Standard deviation
- 73.Smad= Small moehrs against decapentapepic
- 74.SPPF= Simplified Papilla Preservation flap
- 75.SPSS= Statistical Package for the Social Sciences
- 76.TGF β = Transforming growth factor beta
- 77.TNF= Tumor necrosis factor
- 78.VEGF= Vascular endothelial growth factor
- 79.1 α ,25-OH 2D3= 1 alpha 25 dihydroxy vitamin D3

The American academy of periodontology in 1999 issued a new classification for periodontal disease that includes several major categories which are gingival diseases that is divided into Plaque Induced Gingivitis, Non Plaque Induced Gingivitis, Chronic Periodontitis, Aggressive Periodontitis, Periodontitis as a Manifestation of Systemic diseases, Necrotizing Periodontal diseases, Abscesses of the Periodontium, Periodontitis Associated with Endodontic Lesions and Developmental or Acquired Deformities and Conditions. ⁽⁷⁾

Among these categories chronic periodontitis is one of the most common diseases that occur in the population, it is defined as an infectious disease result in inflammation within the supporting tissues of the teeth, progressive attachment, and bone loss. Its onset is at any age. It is classified according to amount of attachment loss into mild when there is 1 to 2 mm of clinical attachment loss, moderate when 3 to 4 mm of clinical attachment loss and severe when there is 5 mm or more of clinical attachment loss. ⁽¹⁷⁹⁾

Chronic periodontitis is divided clinically into localized in which less than 30% of the teeth are diseased and generalized in which more than 30% of the teeth are diseased. The clinical signs of chronic periodontitis are edema, erythema, gingival bleeding upon probing, and/or suppuration. These clinical signs with progression of the attachment loss results in alveolar bone loss and formation of periodontal defect that is either suprabony or infrabony defect. ⁽¹⁴⁶⁾

Introduction & Review of literature

The suprabony pocket is a pathological sulcus where the base of the pocket is coronal or occlusal to the alveolar crest, while the infrabony is a pathological sulcus where the bottom of the pocket is apical to the alveolar crest. Infra bony defects are divided into: Four osseous walls (buccal, lingual, mesial & distal), three osseous wall (proximal, buccal & lingual walls or buccal, mesial & distal walls Or lingual, mesial & distal walls) two osseous wall (buccal & lingual walls Or buccal & proximal walls Or lingual & proximal walls) one osseous wall and combination. ⁽¹⁰⁴⁾

Treatment of chronic periodontitis requires the elimination of its main causative factor which is supra and sub gingival calculus, that stimulate swelling, edema redness, attachment and bone loss. Elimination of supra and subgingival calculus is done through non surgical therapy which is considered the initial phase of treatment that may or may not be proceeded by surgical therapy. Non surgical therapy's target is to remove supra and subgingival calculus that contains bacterial colonies which stimulate further deterioration of the gingival tissues. ⁽⁶³⁾

Non surgical therapy includes mechanical debridement, anti infective therapy and host modulation. Mechanical debridement includes supra and sub gingival debridement using manual and ultrasonic scalers performed by the periodontist at regular appointments and oral hygiene measures performed by the patient. Periodontal debridement should be done without excessive instrumentation as it can lead to hypersensitivity and pulpitis. Antiinfective therapy includes antimicrobial agents that is either systemically taken or topically applied. ⁽³³⁾