



Republic of Iraq  
Ministry of Higher Education  
and Scientific Research  
University of Baghdad  
College of Dentistry



**EVALUATION OF BETA - TRI CALCIUM PHOSPHATE  
AS BONE SUBSTITUTE MATERIAL FOR RIDGE  
PRESERVATION AFTER EXTRACTION PROCEDURE  
(COMPARATIVE STUDY)**

A Thesis

Submitted to the council of the College of Dentistry at the University of Baghdad  
in partial fulfillment of the requirements for the degree of Master of Science in  
Oral and Maxillofacial surgery.

By

**Shahbaa Ahmed Hadi**

B.D.S.

Supervised by

**Assist. Prof. Dr. Sahar Shakir Al-Adili**

B.D.S., M.Sc.

Baghdad – Iraq

2021 A.D.

1442 A.H.

## **Abstract**

**Background:** Bucco-lingual alveolar ridge collapse and significant ridge atrophy as a result of physiologic bone remodeling may continue up to 12 months' post-extraction.

Bone substitute with suitable graft material and barrier membrane immediately after tooth extraction is most predictable way in ridge preservation. A synthetic graft, pure phase  $\beta$ -tri calcium phosphate, has been documented in human and animal studies to be resorbed and replaced by vital bone after 4 months with CBCT examination, in addition to resorbable collagen membrane for better stabilization.

In addition to preserve the ridge volume the clinical observations revealed excellent soft tissue healing without loss of attached gingiva.

**Aims of the study:** 1-To evaluate the effect of bio absorbable bone graft Material ( $\beta$  -tri calcium phosphate) with a collagen membrane to preserve the alveolar ridge dimensions following tooth extraction.

2-To evaluate the effect of the  $\beta$  -TCP on the bone density of post extraction –sockets by CBCT and to compare the density of cancellous bone formed between grafted and un grafted sockets.

**Materials and Methods:** This prospective comparative clinical study took place at Department of Oral and Maxillofacial Surgery, College of Dentistry, University of Baghdad and Al Falah special dental clinic in Baghdad. Included 21 Patients 8 Male and 13 females with 38 extracted teeth. Age range was 22-60 years with a mean age of (42.86 $\pm$ 10.57).

A total of 24 patients who met the inclusion criteria were enrolled in this study, of which 3 patients did not attend the recall visit after 4months and they were excluded from the study.

The remaining were (21) patients, (13) females and (8) males with an age range (22-60) years old, were enrolled in this study, one of them was included in the two groups, the other (20) patients divided into (11) patient in study group (with 19 tooth) and (9) patient in control group (with 17 teeth).

The patients' age, gender, number of teeth, oral hygiene state were recorded. CBCT images were taken before extraction, both groups had simple non-traumatic teeth extraction, then with study group preparation of about 0.5 mg of B –TCP according to socket size, mix it with normal saline and gently adapt into the socket with condensation, cover with a resorbable collagen membrane and suturing for better stabilization. The suture was removed at 8 -10 days. After 4 months' new bone formed in the socket evaluated by CBCT,

data description, analysis and presentation were performed using Statistical Package for social Science (SPSS version 21, Chicago, IL, USA) Statistical analyses.

**Results:** Of the 38 extracted teeth, 20 grafted teeth with bone graft and 18 was free from graft. There was a significant increase in bone density through 4 months Post-operatively in study group  $1372.325 \pm 133.216$  compare with control group. Alveolar socket height loss was reducing post -operatively in study group than in the baseline ( $7.935 \pm 2.194$  versus  $8.915 \pm 2.529$ ) mm. While in control group there was height loss post -operatively than pre -operatively ( $7.372 \pm 1753$  versus  $9.611 \pm 2.444$ ) mm. but statically not significant difference between two groups.

Regarding width loss, there were a significant difference in reduce width loss post operatively in study ( $5.082 \pm 1.324$  versus  $6.085 \pm 1860$  pre) than control group ( $3.981 \pm 0.979$  versus  $5.537 \pm 1.145$ ) mm.



جمهورية العراق  
وزارة التعليم العالي والبحث العلمي  
جامعة بغداد  
كلية طب الأسنان



تقييم ماده ثلاثي فوسفات الكالسيوم كماده تعويضية لمكان القلع للحفاظ  
على سلامة العظم (دراسه مقارنه)

رسالة مقدمة الى مجلس كلية طب الاسنان في جامعة بغداد كجزء من متطلبات نيل  
شهادة

الماجستير في جراحة الفم والوجه والفكين  
قدمت من قبل

شهباء احمد هادي

بكالوريوس طب وجراحة الفم والأسنان

اشراف

أ . م . د سحر شاكر العادلي

بكالوريوس طب وجراحة الفم والاسنان  
ماجستير جراحة الوجه والفكين