

**Republic of Iraq**  
**Ministry of Higher Education & Scientific Research**  
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**Evaluation of Crestal Bone Resorption around Dental Implants  
Placed with Flapped and Flapless Surgical Techniques Using Cone  
Beam Computed Tomography (Clinical and Radiological  
Comparative Study)**

A thesis Submitted to the council of College of Dentistry/University of  
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## **Abstract**

**Background:** Dental implants serve as artificial teeth roots, the long term survival of dental implants is evaluated by the amount of crestal bone loss around the implants. There is reason to believe that reflecting a mucoperiosteal flap promotes crestal bone loss in the initial phase after an implant has been inserted. The surgical placement of a dental implant fixture is constantly changing and in recent years, there has been some interest in developing techniques that minimize the invasive nature of the procedure, with flapless implant surgery being advocated. The use of cone beam computed tomography for measuring the volume of bone around dental implants and the height between the implant platform and the first contact bone-implant would be very useful and important for monitoring the bone tissue, in order to preserve the longevity and esthetics of implant-supported dental prosthesis.

**Aims of the study:** To compare the radiographic level of the peri- implant bone level after implant placement between traditional flapped surgery and flapless approach depending on cone beam computed tomography after 24 weeks healing period. Also to make a general comparison between both techniques regarding the duration of surgical operation.

**Materials and Methods:** This clinical prospective study was conducted from December 2017 to November 2018, it included 25 Iraqi patients with an age ranged from 20-60 years who received 47 implants, (One implant in the control group failed so it is excluded from the statistical analysis except in the analysis of survival and failure rates). The patients were divided into two groups: control group which involved 27 implants inserted by conventional flapped surgical approach and study group which involved 19 implants inserted by flapless surgical approach. Preoperative clinical and radiographic assessment were done for all patients and

estimation of alveolar bone width was done for study group by bone (ridge) mapping procedure. One implant system was utilized in the study (Nucleus Co., Turkey). Crestal bone level (loss) and duration of surgical operation for each implant were measured. The bone level was measured by cone beam computed tomography for each implant at buccal and palatal/lingual side at two times, at the second day after implant placement (base line data), and after 24 weeks healing period.

**Results:** There was **no significant** difference between study (flapless) and control (flapped) groups in the mean of total crestal bone resorption for buccal and palatal/lingual side after 24 weeks from implant placement ( $P= 0.393$  for buccal side and  $P= 0.214$  for palatal side). There was **highly significant** difference between buccal and palatal side regarding crestal bone loss around implants measured by CBCT after 24 weeks from implants placement for both flapped and flapless surgical techniques ( **$P = 0.001$** ). According to the time of surgical operation, implants in the study group were consumed about third of the time required for implants of the control group with **highly significant** difference ( **$P= 0.001$** ).

**Conclusions:** Bone resorption around dental implants placed with conventional flap surgery compared to flapless surgery does not seem to be influenced during the healing period before implant loading.