

# The Marginal Bone Change of Immediately Placed Implant after Extraction.



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**Introduction** Carlsson et al(1997) observed 23% alveolar volume loss after the first 6months after tooth extraction and followed by 11% volume loss after 5years. Loss of alveolar bone height and volume makes implants difficult to be placed in both anatomically and prosthetically ideal position. To minimize this volume loss, a technique which placing an implant right after the tooth extraction was introduced and has been proved as a reliable technique by numerous studies and trials. Furthermore, the concept of "immediate loading" has been introduced to shorten the period of implant treatment, and it can be also applied to the immediately placed implants – which means delivering provisional prosthesis at the day of implant operation.

The purpose of this study is to compare the prognosis between the immediately placed and loaded implants and immediately placed and conventionally loaded (after osseointegration take place) implants by measuring their marginal bone

# Materials & Method

#### 1. Subject

- From 1<sup>st</sup> January 2010 to 31<sup>st</sup> December 2019
- Patients who visited Department of oral and maxillofacial surgery, Anam hospital, Korea university medicine, and received treatment of implant placement immediately after tooth extraction.

### 2. Data research

- Following information were collected by reviewing medical records of the subjects
  - Period after implantation until functioning (as weeks)
- Implant survival time (as months)
- Measuring the amount of marginal bone loss was done with follow-up radiographic data(Fig.1). Bone level was measured at bone-implant contact points, and also at

## Results



#### Fig.2 Flow chart shows case selection to analyze the marginal bone change of each implant



distant crestal points. (both mesial and distal aspect)



**Fig.1** Measuring marginal bone level(X) by calculating proportional length with known length of fixture height(H). Measuring lengths "a(blue line)", "b(red line)" and "c(yellow line)" on digital radiographic image was done with an image processing software(ImageJ). H : X = a : b(c). Peri-apical image were used in measuring. Marginal bone level were measured both at contact point(b) and proximal crestal point(c), and also was done at both mesial and distal aspect.

Fig.3 Graphs show marginal bone change over time at each group

- At direct contact points, both mesial and distal aspect, immediate loading group(IL) showed initial bone loss followed by significant recovery of marginal bone level at both groups
- At distant crestal points, both mesial and distal aspect, both immediate and delayed loading group showed significant recovery although delayed loading group simply had more

#### recovery than immediate group.

**Discussion** Initial bone loss until about 6months after implant placement is usually due to its remodeling sequence of alveolar bone after surgery, and it is considered as an inevitable process. But after osseointegration occurs, when secondary stability become solid, it is possible to expect regaining of previously lost marginal bone height if there is no hindering factors like peri-implantitis during its healing procedure.

This tendency is well shown at the delayed loading group(DL) however, the immediate loading (IL) group showed continuous loss at the direct contact point. Although at proximal point, bone height was regained and recovered partially at both groups, this is thought to be due to the fact that the point is far enough from being affected by the osseointegration and bone remodeling process.

Although this result lack with statistical analysis and lack of sample size may not be significant or reliable, it seems that immediate loading protocol at the immediately placed implant after tooth extraction may have a tendency to trigger more marginal bone loss at long term aspect.