

## R-1. Quality and Morphology on cortico-cancellous bone in Korean mandibular symphysis area

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In performing implant procedures in the anterior portion of the maxilla, many difficulties exist because of anatomical reasons, such as the proximity of the nasal floor, lateral extension of the incisive canal, and labial concavity. On the other hand, in the posterior region of the maxilla, there is often insufficient recipient bone between the maxillary sinus and alveolar ridge due to alveolar ridge resorption and pneumatization of the maxillary sinus. In order to perform implants in such regions, ridge augmentation procedures such as onlay bone graft, guided bone regeneration, and maxillary sinus grafting are performed.

In studies of Caucasians, use of autograft from mandibular symphysis has been reported to be highly successful in maxillary sinus grafting. However, in a clinical study of Koreans, autograft of mandibular symphysis has been reported to have significantly low success rate. It has been hypothesized that this is because of insufficient cancellous bone due to thick cortical bone. In order to test this hypothesis, bone quality and morphology of Koreans can be compared with those of Caucasians.

In this study, the bone density and morphology of the cortical bone and cancellous bone in the mandibular symphysis of 35 Korean cadavers were evaluated. The following results were obtained:

1. In terms of bone density, type I, type II, and type III consisted of 1.4%(3/213), 72.3%(154/213), and 26.3%(56/213) of the cross-sectioned specimens, respectively. In general, the bone density tended to change from type II to type III, as cross-sectioned specimens were evaluated from the midline to the canine. Type IV wasn't observed in this study.
2. The distance between the root apex and the lower border of the cancellous bone was 18.34mm-20.59mm. Considering that the bone has to be cut 5mm below the root apex during the procedure, autografts with about 15mm of vertical thickness can be obtained.
3. The thickness of cortical bone on the labial side increased from the root apex to the lower border of the mandible. The average values ranged from 1.43mm to 2.36mm.

4. The labio-lingual thickness of cancellous bone ranged from 3.43mm to 6.51mm.  
the thickness tended to increase from the apex to the lower border of the mandible and decrease around the lower border of cancellous bone.

From the above results, the anatomic factors of the mandibular symphysis (bone density, thickness, quantity and length of the cortical bone and cancellous bone) didn't show any difference from Caucasians, and it cannot be viewed as the cause of failure in autografts in the maxillary sinus for implants.