

BONE FORMATION AND REMODELING PATTERN IN THE MANDIBLE

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The development of the mandible occurs mainly by intramembranous ossification. However, its subsequent growth is brought about by the secondary cartilages that appear in the heads of the condyles. The present study was carried out to identify the bone formation and remodeling pattern in the mandible, and to establish the rate of bone formation at different sites in the mandible.

Five male and five female Sprague Dawley rats receiving a normal diet were mated. From the day of mating, a bone marker, Calcein (fluorescein methylene iminodiacetic acid-30mg/kg body weight), was injected intraperitoneally to the female rats at weekly intervals. This was continued on the new born rats up to seven weeks and the rats were sacrificed.

Ground sections were prepared from the condyle and the base of the mandible. The observations under fluorescent microscopy revealed that the pattern of bone formation differed in the condyle and the base of the mandible.

Clear fluorescent lines arranged in an organized manner were seen in the base. This arrangement was absent in the condyle and the fluorescent material was deposited in a random manner. In the growth cartilage of the condyle the proliferating cartilage cells are not arranged in columns as in the growth cartilage of a long bone. Therefore, the growth at the condylar head is multidirectional and fluorescent lines are not seen.

The distance between fluorescent lines were measured using a calibrated ocular grid at the buccal alveolar bone, lingual alveolar bone, and the basal bone of the mandible. The mean values of bone formation obtained for these sites were $10.00 \pm 9.16 \mu\text{m}$, $42.85 \pm 00 \mu\text{m}$ and $21.86 \pm 10.39 \mu\text{m}$ respectively.