

a mid-layer of palisade-like fibroblasts and certain electron-dense osmiophilic spiral fibers inserting into the articular cartilages (Figs. 12, 13 and 14). The specific matrix fibers shifted bilaterally and inserted abruptly into the ECM of articular fibrocartilages containing abundant collagen (Figs. 13, 14 and 15). Ultrastructure examination of the AL indicated that spiral fibers, interposing type I collagen fibers bundles, comprised elaunin fibers measuring about 1 μm in diameter. These displayed accumulation of amorphous elastin and adherence of the associated electron-dense microfibrils (Fig. 16). No distinct histological changes in mature SVJ were found between b.21.d and b.28.d (Figs. 12, 13 and 14).

Mandibular Joint

V.p.11.d to v.p.12.d

Condensation of mesenchymal cells and preosteoblasts surrounding the proliferating dental lamina and lateral to Meckel's cartilage of the first pharyngeal arch was found. A single ossification center for each half of the mandible arch arose during v.p.11.d to v.p.12.d, in the region of the future mental foramen. Intramembranous ossification spread from the center

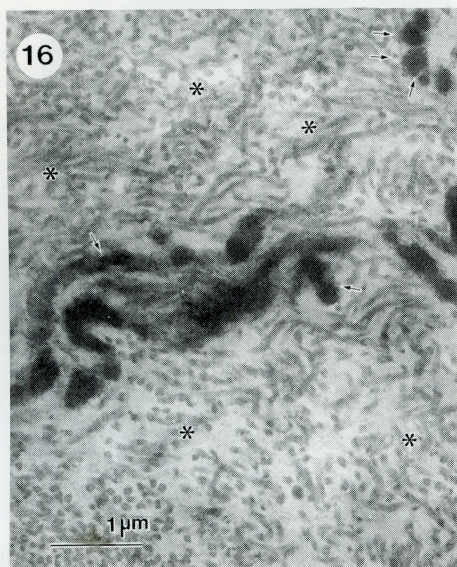


Fig. 16. Higher magnification of collagen fibers (asterisks) and bundles of elaunin fibers (arrows) in the Extracellular matrix (ECM) of b.28.d Stapediovestibular joint (SVJ).

dorsally and ventrally to form the mandibular bone.

V.p.13.d to v.p.15.d

Initiation and growth of condylar cartilage from mesenchyme surrounding the superior end of the developing mandibular membranous bone were observed during v.p.13.d. Condylar cartilage became hypertrophic with perichondrial ossification and was subsequently replaced through endochondral ossification (Fig. 17).

V.p.15.d to v.p.20.d/b.0.d

The development of superior and inferior articular cavities was found in v.p.15.d and v.p.17.d, respectively. In v.p.20.d/b.0.d, light microscopy clearly revealed the separation of superior and inferior articular cavities by a fibrous band (future articular disc), suggesting an early genesis of the MJ (Fig. 18).

B.10.d to b.28.d

Visual examination revealed that incisors and mo-

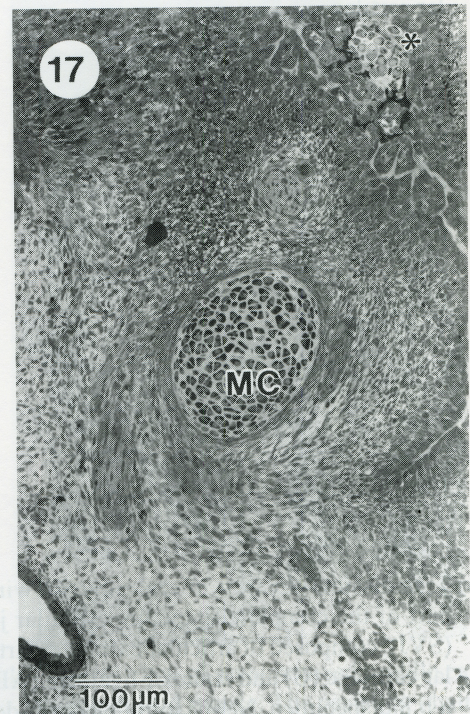


Fig. 17. Light microscopy showing proliferation of the condylar cartilage (asterisk) at the superior end of the mandible, which is undergoing intramembranous ossification at v.p.13.d.