Morphological Aspects of the Domestic Pig Articular Cartilage

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SUMMARY

The present paper tries to outline some data about the morphology of the domestic pig articular cartilage, as a starting point for further studies. The study was carried out on articular cartilage samples from domestic pig femoral head and condyles, 1 - 12 years old, from the COMTIM Freidorf slaughterhouse (abattoir). The samples were processed with the usual histological techniques and stained with hematoxilin–eosin, the Masson’s trichrome and Mallory’s trichrome methods. The samples were processed in the Histology laboratories of both the Veterinary Medicine Faculty and the Victor Babeș University of Medicine and Pharmacy from Timisoara. The study revealed that the cartilage has different thickness, depending on the age and the place where from it has been taken. Both the variability of the matrix organization and the phenotype of the chondrocytes form the basis for the 4 zones. The superficial zone has a few cells and is rich in collagen fibres. The chondrocytes were prolonged, discoidal, with the long axis parallel to the surface. The transition zone has a reduced collagen network and has more cells as compared with the superficial zone. The chondrocytes are round or spherical, dispersed heterogeneously, and often grouped. In this zone the chondrocytes are relatively isolated from one another by a huge amount of extracellular matrix. In comparison to the superficial zone, a significant increase of the collagen content in the extra cellular matrix is observed. At the young domestic pig, cells in division can often be observed in the transition zone. The deep zone consists of hypertrophic chondocytes organized in chondrons. In the depth of the radial zone there is a second layer of cells in division, which is persistent both at the young and the adult animal. In the calcification zone the disposal of the collagen fibres is radial - perpendicular to the surface, or circular - around the chondrocyte lacunae, like a muff. The chondrocytes are small, or in a necrotizing process, rare, disposed at random, closed in nonmineralized lacunae or in those in course of mineralization. In the adult the calcification zone is final and avascular. In young animals this zone is difficult to define because the cartilage is in growth. The tidemark between the mineralization zone and the radial one is slim and irregular. In young animals the tidemark is less evident because of the existent chondrogenic activity as the formation of the articular cartilage is not closed. The 4 zone description is according to the data found in the specialized literature for other species. In conclusion, the normal morphological aspects of the domestic pig articular cartilage were the four layers organization, that is analogous with the morphological aspects found in the specialized literature for the other species.