

Veterinary Bioscience: Cells to Systems

Lecture 28 - Disorders of Tissue Mass and Cell Differentiation 1

Lecturer: A/Professor Jenny Charles

As a veterinary graduate of the University of Sydney, Jenny Charles undertook specialist training in veterinary anatomic pathology at the University of Melbourne and the University of Guelph. She also worked in the United Kingdom on the clinical diagnosis and eradication of bovine spongiform encephalopathy before returning to Australia. She is a Diplomate of the American College of Veterinary Pathologists and previously served as a member of the international WSAVA multi-disciplinary team responsible for refining diagnostic criteria for hepatobiliary disorders of dogs and cats. Jenny's research interests include disorders of the liver, pancreas, and cardiovascular and reproductive systems of domestic animals, diseases of New World camelids, causes of wastage in the horse racing industry, and applied aspects of clinical pathology

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Intended Learning Outcomes

At the end of this lecture, you should be able to:

- use appropriate terminology to describe congenital lesions characterised by deficits of tissue mass or disorderly tissue development
- describe the characteristic gross and microscopic features of atrophy
- explain the factors that contribute to cell and tissue atrophy.

Keywords

congenital, agenesis, aplasia, hypoplasia, dysplasia, atresia, atrophy, ceroid lipofuscin, ageing, abiotrophy

Lecture Overview

Many disorders of veterinary importance involve abnormalities of cell and tissue growth and/or differentiation. These conditions may result in excess tissue mass, a deficit of tissue, or an abnormal pattern of tissue growth. Some of these conditions manifest at birth (as congenital malformations) whereas others are acquired later. In this lecture we will examine developmental disorders of tissue mass, using a range of veterinary examples: agenesis, aplasia, hypoplasia, dysplasia and atresia. The concept of cell and tissue atrophy (a decrease in cell size or tissue mass after normal growth has been achieved) will then be discussed, including the gross, microscopic and ultrastructural appearance of atrophic tissues and the causal mechanisms responsible for atrophy. Pertinent veterinary examples of both physiological and pathological atrophy of tissues will be presented, including the mechanisms that contribute to atrophy of tissues and organs during the process of ageing.

Further Reading

MA Miller and JF Zachary. Mechanisms and Morphology of Cellular Injury, Adaptation and Death. In: *Pathologic Basis of Veterinary Disease*. 6th ed. Ed. JF Zachary. Elsevier, Inc., St Louis, USA (2017), pp. 2-43 (emphasis on pp. 22-26 and 41-43)