



ECVP/ESVP Summer School in Veterinary Pathology



Marie Curie Training Courses

Summer School 2006 – Mock Exam Case 10

10. Tissue from a HORSE

DESCRIPTION OF THE ULTRASTRUCTURAL FINDINGS

Skeletal muscle. Two cells of the same type (myofibres) are present on the electron micrograph. Both myofibres are surrounded by a 100-nm-thick basement membrane (*lamina rara* and *lamina densa*) and a plasma membrane (sarcolemma). Between myofibres, there is a very low amount of collagen fibres (supporting connective tissue, endomysium). The cytoplasm of both myofibres contain numerous oval-shaped 1- μ m-diameter mitochondria in a subsarcolemmal location. The cytoplasm is filled with myofibrils, and membranous cisternae (transverse tubules of sarcoplasmic reticulum). The myofibrils in longitudinal section consist of intermingled thin and thick filaments and form every 3 micrometers an electron-dense line (Z-line) delineating the sarcomeres. On each side of Z-lines, is an electron-lucent band (I-band, containing only thin filaments). In each sarcomere is a moderately-electron-dense band (A-band) centered on a denser M-line. Each M-line is located at the centre of an electron-lucent H-band (containing only thick filaments).

Free in the cytoplasm, and also in the centre of myofibrils, are abundant 50-nm-diameter round particles of electron-dense material interpreted as granules of glycogen (*in fact, mixture of glycogen, abnormal glycogen and complex polysaccharides*). The excessive material is not demarcated by a membrane (*non-lysosomal storage*).

MORPHOLOGIC DIAGNOSIS/DIAGNOSES

Myofibres, cytoplasmic (1) overload (storage) (1) with glycogen (1) particles.

NAME THE DISEASE

Equine polysaccharide storage myopathy.

MARKS

Skeletal muscle or myofibre	1
Basement membrane	1
Collagen fibres or endomysium	1
Mitochondria + subsarcolemmal location	2
Sarcoplasmic reticulum (or transverse tubules).....	1
Myofibrils + sarcomeres + Z-lines.....	3
Granules of glycogen.....	1
Location: free in the cytoplasm, including in the myofibrils.....	2
Size or shape	1
High electron density.....	1
Morphologic diagnosis.....	3
Name the disease	1
Design	2