

Cell death in the infundibulum and magnum regions of the oviduct in the domestic fowl (*Gallus domesticus*) during natural moulting

Mpango M.M. and M-C.N. Madekurozwa

Faculty of Veterinary Science, University of Pretoria, Pretoria, South Africa. Email: mary.madekurozwa@up.ac.za

Egg production in commercial layers decreases at 65 to 75 weeks of age when moulting begins. Although extensive research has been conducted on the physiology of moulting, there is currently a lack of information on the degenerative processes occurring in the oviduct during this phase of the reproductive cycle.

The present study used histomorphological and ultrastructural techniques to elucidate the types of cell death in the infundibulum and magnum regions of the oviduct during natural moulting. Ten moulting (75 weeks old) commercial hens (Hy-Line W36) were used in the present study. Tissue samples for light and transmission electron microscopy were collected from the infundibulum and magnum regions of the oviduct and processed routinely.

Ultrastructurally, regression was heralded by the presence of autophagosomes, lysosomes and autolysosomes, which are elements of autophagy (Fig. 1).

Apoptosis, which was characterized by the occurrence of cytoplasmic condensation, nuclear chromatin margination and apoptotic bodies, was evident during the intermediate and late stages of regression (Figs. 2 & 3). In contrast necrotic cell death, which was indicated by the loss of plasma membranes, as well as the presence of disintegrating cytoplasmic organelles and leukocytic aggregations, was present in the advanced degenerative stages (Fig. 4).

The results of the study suggest that regression of the infundibulum and magnum, during natural moulting, occurs via a synergy of autophagy, apoptosis and necrosis.

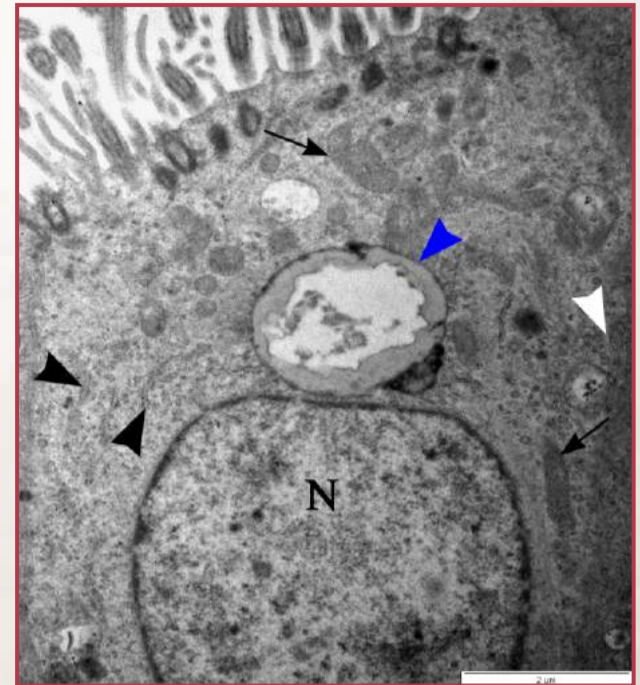


Fig. 1. Ciliated cell in the tubular gland region of the infundibulum. Blue arrowhead: autolysosome. Black arrowheads: rough endoplasmic reticulum cisternae. White arrowhead: Golgi complex. Arrows: mitochondria. N: nucleus.

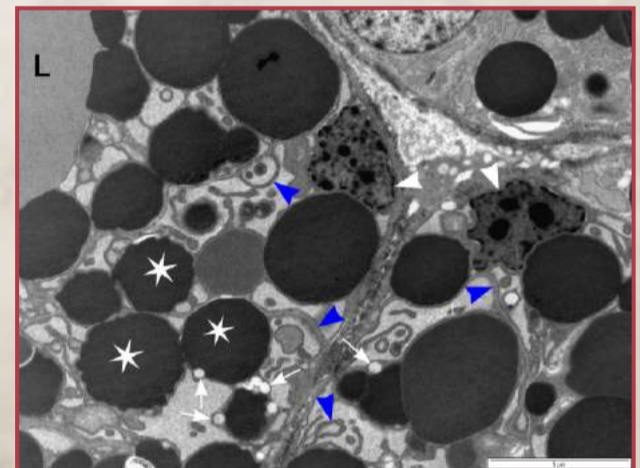


Fig. 2. Regressing magnum gland cells containing degenerating nuclei (white arrowheads), secretory granules (asterisks) and condensed strands of cytoplasm (blue arrowheads). White arrows: vacuoles. L: lumen.

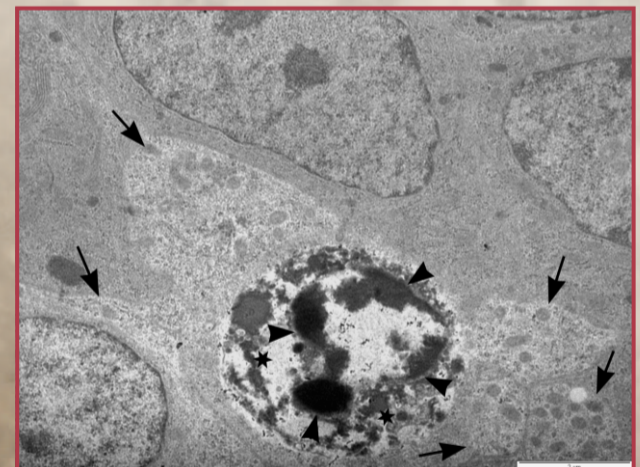


Fig. 3. Phagocytosed apoptotic body in the tubular gland region of the infundibulum. Arrowheads: nucleus. Asterisks: degenerating cytoplasm of the apoptotic body. Arrows: cytoplasmic processes of the phagocytic cell.

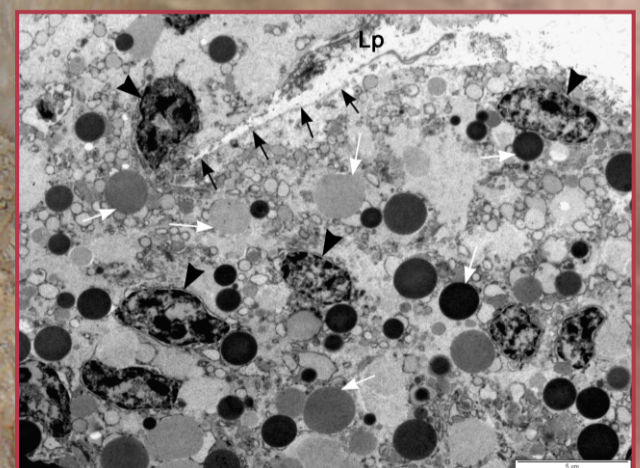


Fig. 4. Degenerating tubular gland in the magnum. Black arrows: remnants of the basal lamina. White arrows: secretory granules. Arrowheads: degenerating nuclei. Lp: lamina propria.

