

MICROANATOMICAL STUDIES ON THE PARATHYROID GLANDS OF HORSE

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Abstract: This study was carried out on the microanatomical structure of the parathyroid gland. Parathyroid gland is covered by thin connective tissue capsule that consisted of collagen and reticular fibers. The capsule sends thin and short trabeculae are extended into the substance of the gland that divided the glandular stroma into incomplete compartment. The parenchyma of the gland consists of two types of cells viz., chief cells and oxyphilic cells. Chief cells are abundant and designated as darkly stained active cells and lightly stained inactive cells. Whereas the oxyphilic cells are larger than the chief cells and are few in number. The oxyphilic cells were characterized by darkly stained eosinophilic granular cytoplasm.

Keywords: Horse, Parathyroid glands, Microanatomical study.

Introduction

The parathyroid gland cells secrete paratharmone hormone which has a great role in the regulation of the calcium metabolism inside the body and play an important role in keeping calcium level within normal inside the blood and compensate any disturbance in calcium in case of some metabolic disorders as hypocalcaemia. In recent years, studies on the histological structure of the parathyroid glands in animals have been reported by El-Zoghby (2004) in buffalo, Bareedy (1987) in goats, Berdahl and Boquist (1973) in dogs and Metwally and Attia (2006) in camels but microscopic studies on parathyroid glands of equine have not been reported in the available literature.

Materials and Methods: Parathyroid glands were collected from 3 horses dissected at the department of Veterinary Anatomy, College of Veterinary Science, Tirupati. Parathyroid glands were fixed in 10% neutral buffered formalin and were processed. 6 µm thick paraffin

sections were stained with haematoxylin and eosin method for general histomorphology, Vangieson staining for Collagen fibers and Wilders method for reticular fibers. (Luna,1968).

Results and Discussion: Each gland was covered by thin connective tissue capsule that consisted of collagen and reticular fibers, from the capsule, thin and short connective tissue trabeculae were extended into the substance of the gland that divided the glandular stroma into incomplete compartment (Fig.1). Connective tissue trabeculae were as thick as capsule and consist of blood vessels and adipose tissue. The gland parenchyma consisted of densely packed cellular structure that were arranged in different forms including cords, follicles and anastomosing cords and were separated by single or double layered collagen and reticular fibers with fibrocytes (Fig. 3&4). The above said arrangement of cells was very compact in periphery and loosely in the centre and in some areas single cells were also observed. Numerous capillaries and sinusoids were observed between the cellular arrangements. Similar results were observed by Nagpal et al (1989) and Metwally and Attia (2006) in Camel, Roy et al (1984) in goat and Charles et al (1965) in cows.

The parenchyma of the parathyroid gland consists of two types of cells, chief cells and oxyphilic cells (Fig.2). Among the two cell types the chief cells were abundant and widely distributed throughout the gland whereas the oxyphilic cells are fewer. The chief cells were designated as two types, darkly stained active cells and lightly stained inactive cells (Fig.2). The chief cells were round to ovoid in shape and the cytoplasm was mostly basophilic. Nuclei were round, vesicular and centrally located. The above results were coincided with the Jagapathi Ramayya et al (2012) in buffalo foetus, Nagpal et al (1989) and Metwally and Attia (2006) in Camel and Charles et al (1965) in cows. Whereas Metwally and Attia (2006) in Camel reported that most of the chief cells were located around the blood capillaries and sinusoids but similar finding was not reported in the present study.

The oxyphilic cells were larger than the chief cells, fewer in number and mostly located as single cells in between the chief cells. The cells were characterized by darkly stained eosinophilic granular cytoplasm (Fig.2). Nuclei were centrally located and heterochromatic. Similar results were observed by Nagpal et al (1989) and Metwally and Attia (2006) in Camel. Capen (1971) Balogh and Cohen (1961) suggested that oxyphil cells do not have an active function in the biosynthesis of parathyroid hormone. Whereas Cortelyou and McWhinnie (1967) and Fujii (1972) had reported that Oxyphil cells were absent in parathyroids of the rat, chicken, and many species of lower animals.

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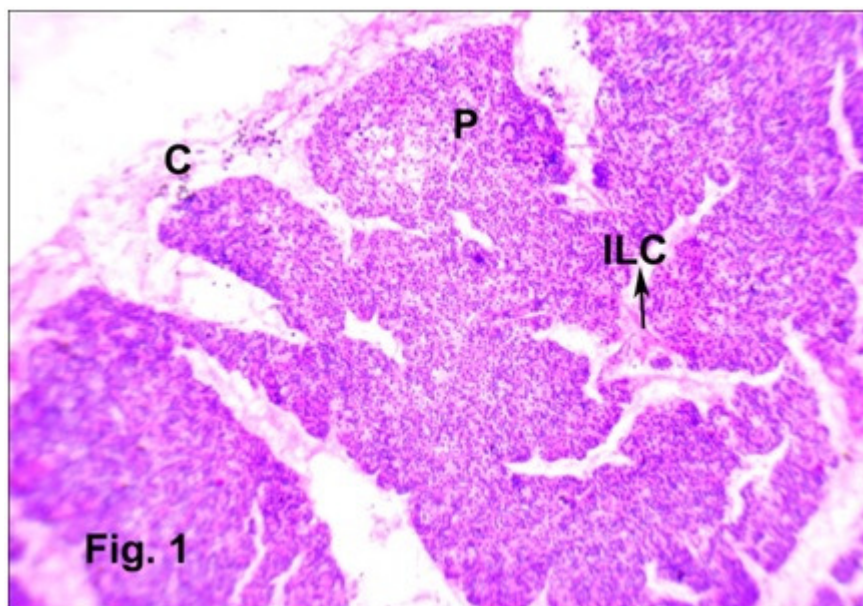
Illustrations

Fig. 1: Photomicrograph of Parathyroid gland of horse showing Capsule (C), Parenchyma (P) and interlobular connective tissue (ILC).
Haematoxylin & Eosin X 100

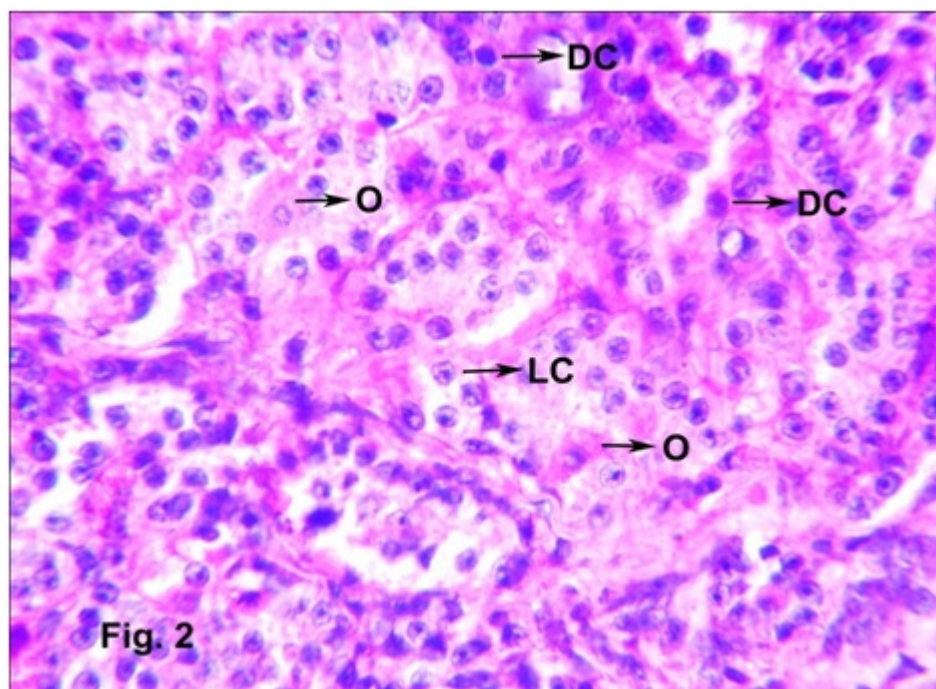


Fig. 2: Photomicrograph of Parathyroid gland of horse showing Oxyphil cells (O) and Chief cells are Light cells (LC) and Dark cells (DC).
Haematoxylin & Eosin X 1000

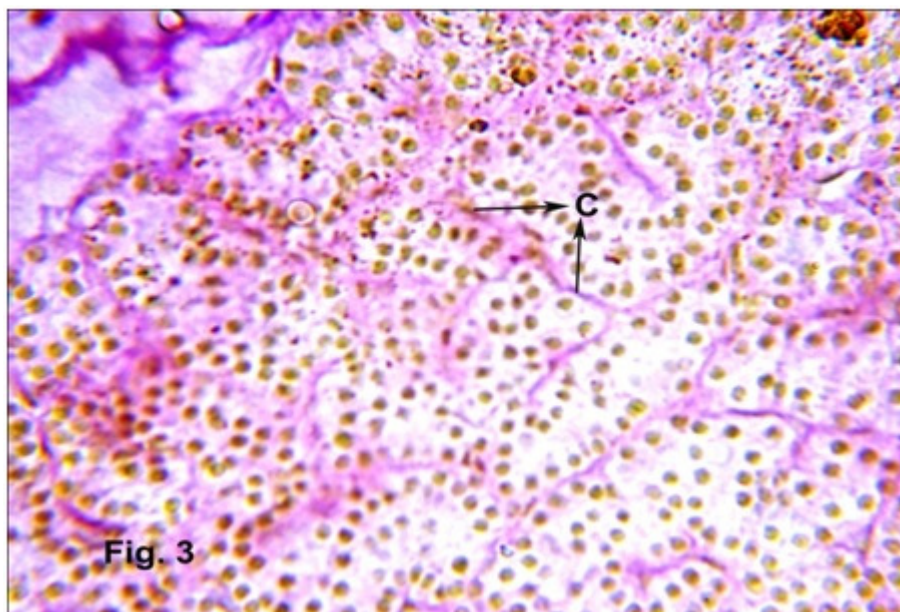


Fig. 3: Photomicrograph of Parathyroid gland of horse showing Collagen fibers (C).
Vangieson's stain X 400

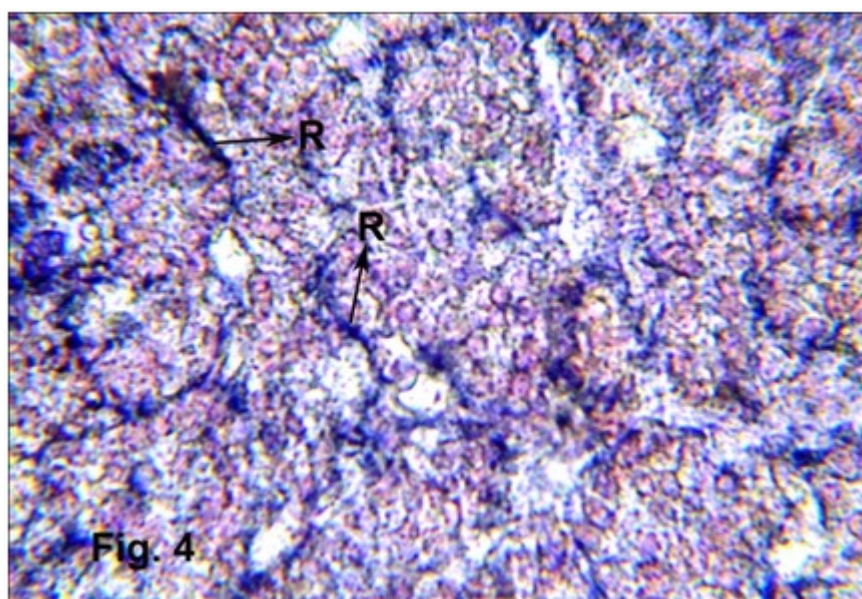


Fig. 4: Photomicrograph of Parathyroid gland of horse showing Reticular fibers (C).
Wilder's stain X 400