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K Iniyah
Department of Veterinary
Anatomy Veterinary College and
Research Institute, Namakkal
Tamil Nadu Veterinary and
Animal Sciences University,
Tamil Nadu, India

Macro and microanatomy of pancreas in guinea fowl

K Iniyah

Abstract

The present study is carried out to obtain information about macro and microanatomy of pancreas in guinea fowl. Samples were collected from six healthy guinea fowls and were processed by routine histological methods and stained with haematoxylin and eosin solution. The pancreas with dorsal and ventral lobes was located between the duodenal loops in the right abdominal cavity. Histologically, the pancreas of guinea fowl comprised of exocrine and endocrine portions. The exocrine part was made up of numerous secretory acinar units with its duct system. The pancreatic acini were lined by pyramidal shaped cells with basal nuclei. The endocrine islets was lightly stained among the darkly stained pancreatic acini and had alpha and beta cells.

Keywords: Macro, microanatomy, guinea fowl

Introduction

The pancreas is an important gland which is associated with gastrointestinal system. It plays both the exocrine and endocrine role in the body of vertebrates. The exocrine part secretes digestive enzymes and the endocrine part secretes hormones such as insulin, glucagon, somatostatin and pancreatic polypeptides. In mammals, the pancreas lies retroperitoneally with head, body and tail regions whereas the avian pancreas consists of mainly two lobes – dorsal and ventral lobes. Guinea fowl, an omnivorous bird has the diet that primarily includes worms and insects on the ground, along with seeds and berries. The present study was to investigate the macro and microanatomy of guinea fowl pancreas to provide the base line information.

Materials and Methods

The pancreas was collected from six apparently healthy guinea fowl slaughtered at the department of meat science. The pancreas was removed along with its attachments to reveal the gross morphology. Then the tissue pieces of pancreas were washed in normal saline and fixed in neutral buffered formalin and bouin's fluid. The fixed tissues were processed through ascending grades of alcohol, cleared in xylene and embedded in paraffin wax (Luna, 1968). By using Leica rotary microtome, paraffin tissue sections of 3-5 microns were made and the sections were utilized for different staining techniques.

Results and Discussion

Macroanatomy

The pancreas was located between the descending and ascending loops of duodenum in right side of the abdominal cavity of guinea fowl. As reported by Al-Agele and Mohammed (2012) in golden eagle and Saadatfar (2009) in mynah, the pancreas was an elongated pale, lobulated gland with dorsal and ventral lobes. But in goose (Deprem *et al.*, 2015) and quail (Simsek and Alabay, 2008), the pancreas was composed of dorsal, ventral, third and splenic lobes.

Microanatomy

The histological study revealed that the pancreas was covered by a very thin connective tissue capsule. The pancreatic parenchyma mainly composed of exocrine part than the endocrine part. The gland parenchyma was compact and was not divided into lobules by interlobular septa as in domestic duck (Madhavi *et al.*, 2000). But in contrary, the septa from the capsule divided the gland into lobules in golden eagle (Al-Agele and Mohammed, 2012) and common gull (Hamodi *et al.*, 2017).

a. Exocrine pancreas

The exocrine portion of the pancreas consisted of many serous tubuloacinar secretory units – pancreatic acini and its associated duct system. The pancreatic acini varied in its shape and size. The pancreatic acini consisted of pyramidal shaped cells as reported by Hamodi *et al.*

Correspondence

K Iniyah
Department of Veterinary
Anatomy Veterinary College and
Research Institute, Namakkal
Tamil Nadu Veterinary and
Animal Sciences University,
Tamil Nadu, India

(2017) in common gull. The nucleus was large, round to oval and placed at the basal portion of the pyramidal cell with prominent nucleoli (Fig. 1). This is in accordance to the findings of Al-Agele and Mohammed, (2012) in golden eagle. The exocrine duct system of pancreas was composed of intercalated, intralobular, interlobular and main pancreatic ducts as found in other avian pancreas. The epithelium of the ducts differed from simple squamous to stratified columnar cells as in pigeon (Mobini, 2013). The ducts were surrounded by connective tissue fibres mainly of collagen.

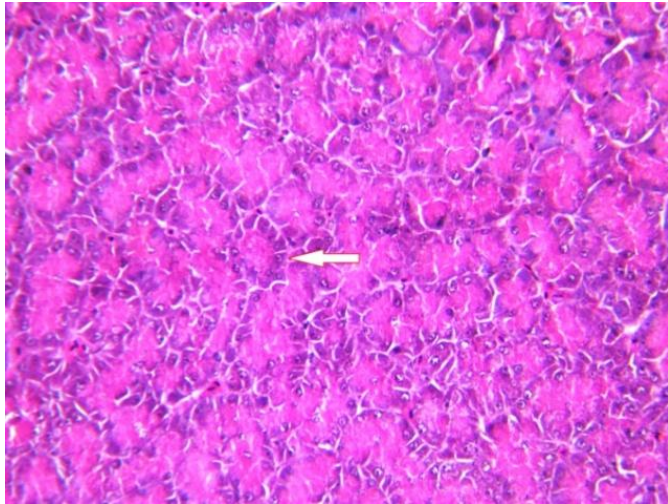


Fig 1: Photomicrograph indicating the pancreatic acini in the pancreas of guinea fowl H&E x 400

b. Endocrine pancreas

The endocrine portion (Islets of langerhans) of the pancreas appeared as lightly stained cells among the darkly stained pancreatic acini. The islets were found as small clusters of cells without any delineation and scattered more at the periphery of the pancreas (Fig. 2). Similar to the findings of Hamodi et al. (2017) in common gull, the endocrine pancreas consisted of mixed type of islets with both alpha and beta cells.

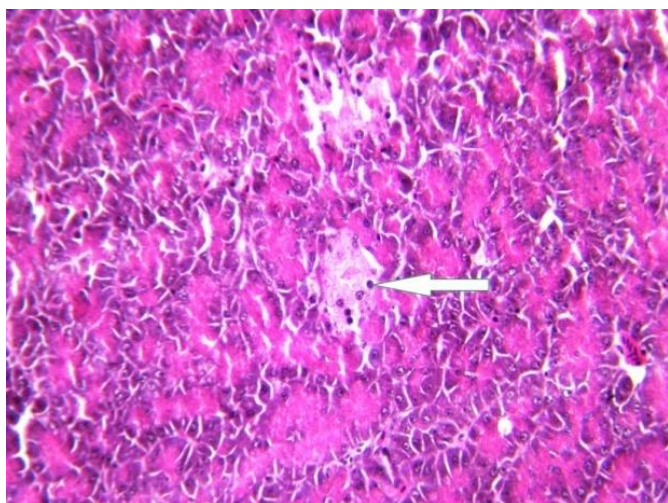


Fig 2: Photomicrograph indicating the endocrine portion of pancreas in guinea fowl H&E x 400

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