

GROSS FEATURES OF INTESTINE IN JAPANESE QUAIL (*Coturnix coturnix japonica*)

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Abstract: The intestine of Japanese quail appeared in the form of a tube like structure extending from gizzard to cloaca with two broad divisions of intestine i.e., small and large intestine. The small intestine was comprised of duodenum, jejunum and ileum, whereas, large intestine showed two parts as caecum and colorectum. The duodenum was originated from anteriodorsal aspect of gizzard and ended at terminal part of ascending limb. The ileum was seen in the form of a straight short tube at the termination of jejunum between two caeca. In the present study, two caeca i.e., right and left, originating ventrolaterally close to the junction of ileum and colorectum.

Keywords: Duodenum, Jejunum, Ileum, Caecum, Colorectum and Quail.

Introduction

Japanese Quails (*Coturnix coturnix japonica*) is catching attention in poultry industry due to its low fat and soft delicious meat. They are farmed for meat and eggs in America, India and Europe (Panda and Singh, 1990; Baumgartner, 1994). Japanese quail considered to be separated from common quail. It is said that species was developed through domestication of the common quail in China and arrived in Japan in the 11th or 12th century. The Japanese quail became popular in the 20th century for meat and egg production. These are fairly resistant to poultry disease and are considered hardy in nature (Randall and Bolla, 2008). Padgett & Ivey (1960) were among the first who described the development of the quail (*Coturnix coturnix japonica*) in detail. The Japanese quails get early maturity (Qureshi, 1996) and physiologically they resemble with domestic fowl (Wilson *et al.*, 1961).

Materials and Methods

The present study was conducted on 48 Japanese quail birds (*Coturnix coturnix japonica*) irrespective of sex were procured from authenticated source was reared on poultry farm of College of Veterinary and Animal Science, Parbhani under standard managerial quail rearing practices. The intestine was collected from 12 (twelve) birds each at end of 7th, 14th, 21st and 42nd day of age. These birds were sacrificed by cranial subluxation. The

intestine was observed in situ for its gross examination like location, colour, shape and relation with other viscera.

Result and Discussion

After exposure of abdominal cavity, the intestine appeared in the form of a tube like structure extending from gizzard to cloaca with two broad divisions of intestine i.e., small and large intestine. The small intestine was comprised of duodenum, jejunum and ileum, whereas, large intestine showed two parts as caecum and colorectum. The duodenum was the first section of small intestine and was in the form of U shaped loop like structure. This duodenal loop had a descending and ascending limbs. The pancreas was located between the descending and ascending limbs of duodenum. The duodenum was originated from anteriodorsal aspect of gizzard which ended at terminal part of ascending limb. The left side of duodenum was in connection with gizzard while dorsal side was covered by jejunum, caecum and ileum. The right side of duodenum appeared in contact with liver and lateral body wall (Figure 1).

Similar to our observations, many earlier research studies including Bailey *et al.* (1997) in houbara birds, Zaher *et al.* (2012) in quails and Oyelowo *et al.* (2017) in barn owl (*Tyto Alba*) also reported the two parts of intestine as small (duodenum, jejunum and ileum) and large intestine (caecum and colorectum). The U shaped loop of duodenum was also observed by Dyce *et al.* (2002) in fowl and Oyelowo *et al.* (2017) in barn owl (*Tyto Alba*).

In present study, duodenum was originated from anteriodorsal aspect of gizzard and ended at terminal part of ascending limb. The left side of duodenum was in connection with gizzard while dorsal side was covered by jejunum, caecum and ileum. The right side of duodenum appeared in contact with liver and lateral body wall. These findings are in congruent with the observations recorded by Dyce *et al.* (2002) and Nasrin *et al.* (2012), while Partha *et al.* (2002) could not found the significant difference in topographic anatomy of duodenum in fowls, ducks and quails.

In present study, the jejunum appeared as a longest part of intestine and it was continuation of duodenum after ascending limb in the form of coils suspended by mesenteric folds. The jejunum loops were seen on the dorsal aspect of abdominal cavity and ventrally related to duodenum and gizzard. No distinct gross differentiation was observed between duodenum and jejunum. In collaboration with findings of present study, King and McLelland (1975), Nickel *et al.* (1977), Verma (1998) and Hassouna (2001) reported the jejunum as a longest part of intestine. Contrary to this, Zaher *et al.* (2012) and Mahmud *et al.* (2015) observed the ileum as a longest part of intestine in quails and three Nigerian indigenous genotypes of

chicken respectively. However, Oyelowo *et al.* (2017) reported that the ileum was the shortest segment of the small intestine of barn owl (*Tyto Alba*). The variation found in gross anatomy of various segments of intestine might be due to different avian species.

The ileum was seen in the form of a straight short tube at the termination of jejunum between two caeca. Distinct differentiation between jejunum and ileum was not observed. These observations are in full agreement with the findings recorded by Fitzgerald (1969) in Japanese quail, Hodges (1974) in fowl, Nickel *et al.* (1977), Verma *et al.* (1998) and Hassouna (2001) in birds.

In the present study, two caeca i.e., right and left, originating ventrolaterally close to the junction of ileum and colorectum was observed. Both caeca were attached to the ileum by peritoneal folds and they referred as ileocaecal ligaments. Each caecum showed three parts as proximal, middle and distal parts in which the distal part of caecum presented rounded cul-de-sac like blind ended structure. The colorectum was also in the form of short, straight tube and it was the continuation of ileum after origin of caeca and distally opened into cloaca. These findings are supported by Kumary *et al.* (2009), Zaher *et al.* (2012), Rajathi (2017) and El Deeb *et al.* (2017) who also mentioned the similar origin and structures of caeca in quails and Nasrin *et al.* (2012) in broiler chickens.

Summary and Conclusion

In the present study, duodenum was originated from anteriodorsal aspect of gizzard and ended at terminal part of ascending limb. The ileum was seen in the form of a straight short tube at the termination of jejunum between two caeca. In the present study, two caeca i.e., right and left, originating ventrolaterally close to the junction of ileum and colorectum.

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Figure 1. Gross anatomy of intestine at 42nd day of age

A. Descending limb of duodenum

B. Ascending limb of duodenum

C. Pancreas

D. Testis

E. Gizzard

F. Jejunum.