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Macroanatomic Investigations of the Course and Distribution of the Celiac Artery in the New Zealand Rabbit

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SUMMARY

The course and distrubution of the celiac artery was investigated macroanatomically in the New Zealand rabbits in this study. A number of eight New Zealand rabbits (*Oryctolagus cuniculus: Rodentia*) (four male, four female) were used in the study. The materials were injected with red colored latex and corrosion casted with mono- polymethymethacrylate (takilon) through the abdominal aorta. It was determined that the celiac artery arose from the ventral surface of the abdominal aorta, and terminated giving off the lienal, left gastric and hepatic arteries. It was observed that the lienal artery originated from the left border of the celiac artery and terminated under the name of the left gastroepiploic artery. It was state that the left gastric artery anastomosed with the right gastric and short gastric arteries. It was indicated the short gastric arteries was determined to stem from the lineal artery in the New Zealand rabbits. In the study, it was also observed that the proper hepatic artery was not to be a branch of the hepatic artery. It was determined that the hepatic artery was the continuation of the celiac artery after leaving the left gastric artery and terminated splitting the right and left branches after giving off the common stem of the right and middle gastric arteries, the side branches to pylorus and lesser omentum and the gastroduodenal artery. The branches and distribution of the celiac artery were found to be not gender dependent.

Key Words: *Macroanatomy, Arterial vascularization, Celiac artery, New Zealand rabbit*

ÖZET

Yeni Zelanda Tavşanında Arteria Celiaca'nın Seyri ve Dağılımı Üzerinde Makroanatomik Araştırmalar

Bu çalışmada Yeni Zelanda tavşanında arteria celiaca'nın seyri ve dağılımı makroanatomik olarak incelendi. Çalışmada 8 adet Yeni Zelanda tavşanı (*Oryctolagus cuniculus* : *Rodentia*) (4 erkek, 4 dişi) kullanıldı. Materyallere aorta abdominalis aracılığı ile kırmızı boya ile renklendirilmiş latex ve mono-polymethymethacrylate (takilon) enjekte edildi. Arteria celiaca'nın aorta abdominalis'in ventral yüzünden başlangıç aldığı ve arteria lienalis, arteria gastrica sinistra ve arteria hepatica'yı vererek sonlandığı belirlendi. Arteria lienalis'in arteria celiaca' nın sol kenarından orijin aldığı ve arteria gastroepiploica sinistra adı altında sonlandığı gözlendi. Arteria gastrica sinistra'nın arteria gastrica dextra ve arteriae gastricae breves ile anastomozlaştığı ortaya konuldu. Yeni Zelanda tavşanlarında arteriae gastrica breves'lerin arteria lienalis'den köken aldığı gösterildi. Çalışmada ayrıca arteria hepatica propria'nın arteria hepatica'nın bir dalı olmadığı tesbit edildi. Arteria hepatica'nın arteria gastrica sinistra ayrıldıktan sonra arteria celiaca'nın devamı durumunda olduğu ve arteria gastroduodenalis, pylorus ve omentum minus'a yan dallar ile arteria gastrica dextra ve arteria gastrica sinistra'nın ortak kökünü verdikten sonra sağ ve sol dallara ayrılarak sonlandığı belirlendi. Arteria celiaca'nın dalları ve dağılımının cinsiyete bağlı olmadığı tesbit edildi.

Anahtar Kelimeler: *Makroanatomi, Arteriel vaskularizasyon, Arteria celiaca, Yeni Zelanda tavşanı*

INTRODUCTION

The celiac artery is the first branch of the descending aorta in the New Zealand rabbit. It originates from the ventral surface of the abdominal aorta at the level of the aortic hiatus of the diaphragm in the rabbit (Craigie1969; Mc Laughling and Chiacsson1979; Malinovsky and Bednarova 1988; Cirli 2006). It is reported that the celiac artery is arisen from the aorta at the level of the first lumbar vertebra (Blondeau 1966), the cranial 1/3 of the last lumbar vertebra (Cakır 1991) and the fundus ventriculi (Malinovsky and Bednarova 1988). It ends dividing into the lienal, left gastric and hepatic arteries in the rabbit (Blondeau1966; Mc Laughling and Chiacsson 1979; Pallicica et al. 1986; Cakır 1991; Cirli 2006; Abidu - Figueiredo et al. 2008)

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The lineal artery is the first branch arising from the left side of the celiac artery 5-10 mm after its origin (Blondeau 1966; Mc Laughling and Chiacsson1979; Cakır 1991; Abidu -Figueiredo et al. 2008). It runs toward the left and caudoventrally (Blondeau 1966; Cakır 1991). It gives off the lineal branches to lien, short gastric artery to the stomach, pancreatic branches to the pancreas. It continues as the left gastroepiploic artery (Blondeau 1966; Craige 1969; Mc Laughling and Chiacsson 1979; Cakır 1991; Kahvecioglu et al. 2001, N.A.V. 2005; Cirli 2006).

The short gastric arteries have three branches. The first or first two small branches leaving from the short gastric artery run to the lien (Blondeau 1966; Cakır 1991). The left gastroepiploic artery runs into the gastrolienal ligament at the greater curvature of the stomach. After giving different numbers epiploic branches, it anastomoses with the right gastroepiploic of the hepatic artery at the greater curvatura of the stomach (Blondeau 1966; Craigie 1969; Malinovsky and Bednarova 1988; Cakır 1991, Kahvecioglu et al. 2001).

The left gastric artery is the second branch of the celiac artery, leaving nearly 4 mm after from the lineal artery (Mc Laughling and Chiacsson 1979; Cakır 1991, Kahvecioglu et al. 2001). It reaches to the pylorus following the lesser curvature of the stomach. It ends anastomosing with the right gastric artery at this level (Malinovsky and Bednarova 1988; Cakır 1991). In its course, it gives off the esophageal branch to the cardia, lesser curvatura, parietal and visceral surface of the stomach (Blondeau 1966; Malinovsky and Bednarova 1988; Kahvecioglu et al. 2001, Abidu-Figueiredo et al. 2008). In a study conducted in Angora rabbits the pancreatic branches has been reported to arise from the left gastric artery (Cirli 2006).

The hepatic artery is reported to be continuation of the celiac artery after leaving the left gastric artery (Mc Laughling and Chiacsson 1979; Cakır 1991, Kahvecioglu et al. 2001; Cirli 2006). The vessel which its lenght can be variable turns toward the right, distributing to the liver, gall bladder and pancreas. It gives off branches, supplying to the pancreas, duodenum and pylorus before entering to the liver (Craigie 1969; Mc Laughling and Chiacsson 1979; Malinovsky and Bednarova 1988; Cakır 1991).

The right and middle gastric artery arise from it with a common root from the hepatic artery (Blondeau 1966, Cakır 1991, Kahvecioglu et al. 2001). The right gastric artery runs along the greater curvature of the stomach through the cardia. It gives off branches, supplying to the lesser omentum, pyloric antrum, duodenum, visceral and parietal faces of the stomach (Blondeau 1966; Malinovsky and Bednarova 1988; Cakır 1991, Kahvecioglu et al. 2001). Its peritoneal branches anastomose with the lienal and right gastroepiploic arteries and, the left gastric artery at the level of the pylorus (Craigie 1969; Malinovsky and Bednarova 1988). The middle gastric artery disperses into the lesser curvature and visceral surface of the stomach (Blondeau 1966; Cakır 1991; Kahvecioglu et al.2001). In various reports (Blondeau 1966 and Cakır 1991), the continuation of the hepatic artery is reported to terminate nearly after 6-25 mm its origin by giving off the gastroduodenal artery. Cirli (2006) has indicated the gastroduodenal artery stems from the hepatic artery nearly after 14-20 mm its origin. However, the study carried out in the rabbits (Kahvecioglu et al. 2001) has described the hepatic artery is contributed to the gastroduodenal and proper hepatic arteries after 6 mm its origin. The gastroduodenal artery terminates giving off the cranial pancreaticoduodenal and right gastroepiploic arteries near the pars descendens of duodenum (Blondeau 1966; Malinovsky and Bednarova 1988; Cakır 1991; Kahvecioglu et al. 2001, Cirli 2006).

The right gastroepiploic artery runs along the greater curvature of the stomach through the cardia (Kahvecioglu et al. 2001). It gives off short gastric branches to the part of coalescence visceral and parietal surface of the stomach and epiploic branches to the greater omentum. It anastomoses with the left gastroepiploic artery originating from the lineal artery at the greater curvatura of the stomach (Blondeau 1966; Craigie 1969; Malinovsky and Bednarova 1988; Cakır 1991, Kahvecioglu et al. 2001).

The cranial pancreaticoduodenal artery gives off branches to the pancreas and duodenum. These branches anastomose with the caudal pancreaticoduodenal artery of the cranial mesenteric artery (Blondeau 1966; Malinovsky and Bednarova 1988; Cakır 1991)

Blondeau (1966) has reported that the hepatic artery is oriented to the cranial crossing the lesser curvature of the stomach and it separates two branches to the caudal and papillary lobes of the liver and the cystic artery to gall bladder. After its continuation gives off two branches to the right and intermediate lobes of the liver and it ends giving a branch to the left lob of the liver. Cakır (1991) is stated that the hepatic artery has been separated into the interlobar and cystic arteries to the right lob of the liver, after 7-8 mm to its continuation is given three branches. Furthermore, Mc Laughling and Chiacsson (1979) has reported the right and left branches originating from the hepatic artery to the related part of liver and the cystic artery from the left branch to the gall bladder.

According to available literature, there was not any adequate information about the celiac artery in the New Zealand rabbits. Therefore, the present study was undertaken to define the arterial vascularisation of the celiac artery and its branches in this animal, to determine characteristic to the New Zealand rabbits, and to lay out similarities with, and differences from, other species.

MATERIALS and METHODS

The anatomical dissections were performed in eight cadaveric adult New Zealand rabbits (*Oryctolagus cuniculus: Rodentia*) (four male, four female) provided from Central Anatolia. Deep anaestesia of the animals were induced by initial injection of xylazine HCl (3 mg/kg i.m.) and following by ketamine HCl (50 mg/kg i.m.) in rabbits. Following the washing of the blood vessels by means of the injections of the abdominal aorta with the physiological saline, latex colored with red dye and corrosion casted with takilon was injected. The prepared material was kept at +4 ˚C for 14 h so as to ensure the freezing of latex and, and stored in 10% formalin until dissection. The corrosion cast was made with the monomethylmethacrylate (60 cc), polymethylmethacrylate (15 gr) and red dye (5 gr). Takilon injected material was kept for 24 h in the tap water and placed 30% potassium hydroxide solution. After removing soft tissues, material was washed in the tap water and dried in the fresh air. The course and distribution of celiac artery were examined and digital pictures were taken and entitled. The nominal descriptions of the blood vessels were according to Nomina Anatomica Avium (N.A.V. 2005).

RESULTS

Celiac artery (arteria celiaca). The celiac artery (Figure 1, 2) was the first main visceral branch of the aorta descendens in the New Zealand rabbits. It was the common root of the vessels supplied blood to initial part of the stomach, liver, spleen, pancreas and small intestine. It was seen to arise from the abdominal aorta ventrally in the aortic hiatus of the diaphragm or after the passing of it in the New Zealand rabbit. It was observed that the celiac artery derived from lateral to the right side of the abdominal aorta caudal one of the third of the first lumbar vertebra in one of the New Zealand rabbit example (12.5%), cranial one of the third of the first lumbar vertebra in five rabbits (62.5%), and ventral to the right side of the abdominal aorta of between last and first lumbar vertebra in two rabbits (25%). It gave off the lienal, left gastric and hepatic arteries.

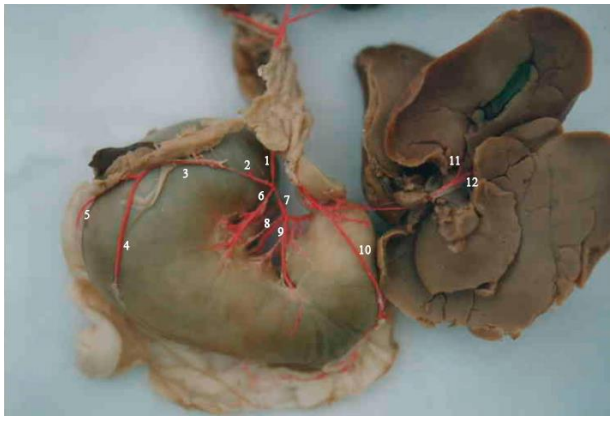

Figure 1. The celiac artery and its branches in the New Zealand rabbit.

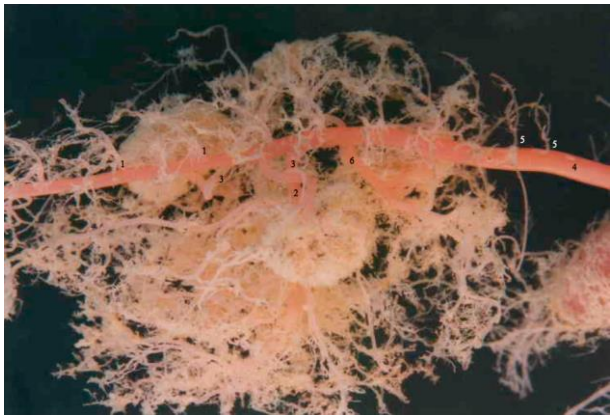

Figure 2. The origin of the celiac artery in the New Zealand rabbit.

Lienal artery (arteria lienalis) (Figure 1).This artery was originated from the left border of celiac artery, at the distance of about 5-10 mm after to the its origin, as the first branch in the New Zealand rabbits. It crossed the lesser curvature of the stomach heading toward the left. It runs through ventrally along the visceral surface of the spleen between the spleen and stomach. After the ventral extremity of the lien, it was terminated into the greater omentum of the stomach under the name of the left gastroepiploic artery. In its course, it distributed into pancreatic branches, short gastric arteries, lineal branches.

Pancreatic branches (rami pancreatici): These blood vessels were small branches distributed to lobes of pancreas.

Short gastric arteries (arteriae gastricae breves) (Figure 1). The short gastric arteries were derived from lineal artery consisting of from two to four in number at the different distance. The first short gastric artery dispersed to the fundus of the stomach at the visceral surface and the others dispersed to visceral surface along the greater curvature of the stomach. It was determined that the first branch leaving from the short gastric in the two of the examples (25%) and, the second branch in the two of the examples (25%) entered to the spleen from the cranial border. It was seen that the short gastric arteries anastomosed with the left gastric artery.

Lienal branches (rami lienalis).These arteries were dispersed entering to the spleen into hilum of the lien. They consist of from five to nine in number.

Left gastroepiploic artery (arteria gastroepiploica sinistra) (Figure1). These vessels were branch of lineal artery, as the continuity of the lineal artery through the greater curvature of the stomach, giving off some epiploic branches to the greater omentum of the stomach. It anastomosed with the right gastroepiploic artery (Figure1), the branch of the hepatic artery at the greater curvature of the stomach.

Left gastric artery (arteria gastricasinistra) (Figure1). This artery was the second branch of the celiac artery separated approximately 1 cm after from the origin of the lineal artery. It was headed toward the cardiac part of the stomach. It reached to the pylorus following the lesser curvature of the stomach at the lesser omentum. It ended by anastomosing with the right gastric of the hepatic artery at this level. This vessel also anastomosed with the short gastric, the branches of the lineal artery near the greater curvature. In its course, it gave off the esophageal branch and the branches dispersing to the cardia, lesser curvature, visceral and parietal surface of the stomach.

Esophageal branch (ramus esophageus). This blood vessel was the first branch arising nearly 4 mm after the left gastric artery. It was seen to send an artery to the visceral surface of the stomach after 2 mm its origin in one of the example (12.5%). It passes toward the cardiac part of the stomach. After it gave off branches supplying to the cardiac part of the stomach, it followed to the last part of the esophagus toward the cavity of the chest. It anastomosed with the esophageal branch arising from the bronchoesophageal artery.

The left gastric artery gives off two to three thin branches, after a short running, on arriving to the corpus of visceral surface and the left part of the stomach. These branches were dispersed to the cardia, lesser curvature and omentum and the last part of esophagus. The continuation of the left gastric artery gave off one thick branch to the left part of stomach at the left of esophagus. This branch arriving to cardia divided into thinner branches. It was observed that some of these passed to the parietal surface from the left of the esophagus. They were distributed to the gastric body.

Hepatic artery (arteria hepatica) (Figure 1). The hepatic artery was the continuation of the celiac artery after leaving the left gastric. It was directed toward the right giving off the pancreatic branch to the pancreas just after its origin. It was terminated splitting the right and left branches (Figure 1) after giving off the common stem of the right and middle gastric arteries, the side branches to

pylorus and lesser omentum and the gastroduodenal artery.

Right gastric artery (arteria gastricadextra) (Figure 1). This artery was originated from the hepatic artery 5 mm after its origin by a common trunk with the middle gastric. It was originated from just after the origin of the left gastric artery in one of the example (12.5%); while it was originated from 6 mm after the origin of the left gastric artery in the case of two branches one after another in one of the example (12.5%). The right gastric artery gave off branches dispersing to the esophagus, pylorus, lesser curvature of the stomach, descending duodenum, and radiational branches into parietal and visceral part of the stomach. It anastomosed with the side branches of the left gastric artery at the lesser curvature of the stomach and the right gastroepiploic artery at the greater curvature of the stomach.

Middle gastric artery (arteria gastrica media) (Figure 1). This vessel gave off dispersing sub branches to the cardiac part, lesser curvature and visceral surface of the stomach.

Gastroduodenal artery (arteria gastroduodenalis) (Figure 1). This blood vessel was originated approximately 1 cm after from the hepatic artery. It was detected that it was arisen from the celiac artery just before the origin of the left gastric artery in one of the example (12.5%).It was distributed branches to the pancreas, pyloric part of the stomach, descending duodenum. It ended splitting into two branches, namely the right gastroepiploic and cranial pancreaticoduodenal arteries.

Right gastroepiploic artery (arteria gastroepiploicadextra) (Figure 1). This artery was arisen from the gastroduodenal artery at the descending duodenum. It run along the greater curvature of the stomach oriented to caudoventrally. In its course, it sent epiploic branches to the greater curvature of the stomach and two to six sub branches to both surface of the stomach at different intervals. It terminated anastomosing with the left gastroepiploica artery (Figure 1) a branch of the lineal artery at the greater curvature of the stomach.

Cranial pancreaticoduodenal artery (arteria pancreaticoduodenalis cranialis) (Figure 3). This artery was a branch of the last two branches of the gastroduodenal artery. It passes to the caudal at the descending part of duodenum. It was separated lots of sub branches to the pancreas and duodenum in its course. It anastomosed with the caudal pancreaticoduodenal artery (Figure 3) a branch of the cranial mesenteric artery at the level of the cranial duodenal flexure.

Figure 3. Anastomosis between cranial and caudal pancreaticoduodenal artery in the New Zealand rabbit.

The right branch of the hepatic artery (ramus dexter). This vessel was originated from the hepatic artery nearly 2 cm after from the origin of the gastroduodenal artery. It was observed that it dispersed into the organ entering to the liver from ventral to the papillary process.

The left branch of the hepatic artery (ramus sinister). This branch run toward the left directed to the porta hepatis after originating from the hepatic artery. It gave off the cystic artery to the gall bladder approximately 1 cm after from its origin. The continuation of the vessel was terminated dispersing into the left lob of the liver.

DISCUSSION

The present study demonstrated that the celiac artery, the common root of the vessels supplied blood to the initial part of the stomach, liver, spleen, pancreas and small intestine was similar to the previous reports carried out in the New Zealand rabbits (Fowler 1991; Gezici and Dursun 1999). The celiac artery was determined to arise from the abdominal aorta ventrally in the aortic hiatus of the diaphragm or just below the aortic hiatus of the diaphragm in the New Zealand rabbits. It has been reported that the celiac artery has separated into 3 branches in the hamster (Orsi et al.1977) and rabbits (Blondeau 1966; Chatelialn 1969; Craigie 1969; Mc Laughling and Chiacsson 1979; Najar et al. 1983; Pallicica et al. 1986; Cakır 1991; Cirli 2006), equids, ruminants, carnivores (Getty 1975; Dursun 1981; Yılmaz et al. 2003) as the left gastric, lienal, hepatic arteries, 2 branches in the rats, pigs, porcupines and dogs (Green 1963; Nickel et al. 1981; Atalar and Yılmaz 2004) as the lineal and hepatic arteries. On the other hand, the left gastric sinistra might originated from the lineal artery and hepatic artery originated from the left gastric artery (Dursun 1981).

In various reports (Blondeau 1966; Mc Laughling and Chiacsson 1979; Cakır 1991; Abidu-Figueiredo et al. 2008) the first branch to ramify from the left side of the celiac artery, about 5-10 mm from the origin of celiac artery, are reported to be the lienal artery. It runs toward the left and caudoventally (Blondeau 1966; Cakır 1991). It is divided into the pancreatic branches to the pancreas (Cirli 2006; Karakurum and Dursun 2010), short gastric arteries to the stomach (Rahm and Frewein 1982; Karakurum and Dursun 2010), lineal branches to the lien (Blondeau 1966; Craige 1969; Mc Laughling and Chiacsson 1979; Pallicica et al. 1986; Cakır 1991; Cirli 2006). According to the result of the present study the lineal artery was the first branch of the celiac artery and the branches of it were consistent with the results of literatures mentioned above. As in the study carried out by Craige (2001) the lineal artery separates into the splenic branches to the lien, short gastric arteries to the stomach and epiploic branches to the greater omentum. Similarly, Kahvecioglu et al. (2001) have reported that the lienal artery gives off the short gastric to the stomach, lineal branches to the lien, the epiploic branch to the greater majus and pancreatic branches to the pancreas.

Short gastric arteries have three branches (Kahvecioglu et al. 2001). The first or first two small branches leaving from the short gastric arteries run to the lien (Blondeau 1966; Cakır 1991). In the New Zealand rabbit examined in the present study, the course and distribution of the short gastric arteries were compliance with previous research. However, it was determined that the first branch leaving from the short gastric in the two of the examples (25%) and the second branch in the two of the examples (25%) entered to the spleen from the cranial border in the two of

the examples (25%). In a study carried out in thirteen rabbits (Kahvecioglu et al. 2001) the short gastric arteries spring from the lineal artery with a common root in four of the animals examined. Contrary to the above report in all of the New Zealand rabbits examined the short gastric arteries was determined to stem from the lineal artery two to four in number at the different distance.

In various reports (Craigie 1969; Orsi et al. 1977; Kahvecioglu et al. 2001; Karakurum and Dursun 2010) the left gastroepiploic artery is reported to be the continuation of the lineal artery and it anastomoses with the right gastroepiploic artery. Reports exit that indicate the left gastroepiploic artery runs into the greater curvature giving off epiploic branches to the greater omentum (Bisaillon and Bherer 1979; Karakurum and Dursun 2010). In all of the New Zealand rabbits examinedin the present study the distributions and course of the left gastroepiploic artery is in agreement with the findings of the above investigations.

The lienal branches have been reported to be divided into two to three branches before entering the lineal hilus in the rabbits (Blondeau 1966), carnivores (Dursun 1981) and porcupines (Atalar and Yılmaz 2004). Similar observations are also reported in the present study which was conducted in the New Zealand rabbits.

The left gastric artery is the second branch of celiac artery in rabbits (Craige 1969, Kahvecioglu et al. 2001) and the domestic animals (Getty 1975; Nickel et al. 1981) leaving nearly 4 mm after from the lineal artery (Mc Laughling and Chiacsson 1979; Cakır 1991). However, Kahvecioglu et al. (2001) have also determined that the left gastric artery emanate from the celiac artery at the same level with the hepatic artery. In the equids (Nickel et al.1981) and rabbits (Cakır 1991) it is reported that the left gastric ends by separated into three branches as the visceral, parietal and esophageal branches. Numerous reports (Blondeau 1966; Malinovsky and Bednarova 1988; Kahvecioglu et al. 2001; Abidu-Figueiredo et al. 2008) indicated that it gives off the esophageal branch to the cardia, lesser curvature, parietal and visceral surface of the stomach in its course. In all of the New Zealand rabbits examined, the esophageal artery was ascertained to originate from the left gastric artery as the first branch arising from nearly 4 mm after its origin. It was seen to send an artery to the visceral surface of the stomach after 2 mm its origin in one of the example (12.5%) investigated. In the German Shepperd dogs (Ozcan et al. 2001) the indicated artery has been reported to anastomoses with the right gastric at the lesser curvature of the stomach. Furthermore, Kahvecioglu et al. (2001) are also demonstrated that it anastomoses with the right gastric and short gastric arteries. In the present study conducted in the New Zealand rabbits, the esophageal artery anastomosed with the esophageal branch arising of the bronchoesophageal artery.

The hepatic artery is reported to be the continuation of the celiac artery (Mc Laughling and Chiacsson 1979; Kahvecioglu et al. 2001; Cirli 2006). In all of the New Zealand rabbits examined in the present study, the hepatic artery was also determined to be the prolongation of the celiac artery. The hepatic artery divided into two branches just before reaching the porta hepatis in the equids, ruminats (Nickel et al. 1981), rabbits (Abidu-Figueiredo et al. 2008) and porcupines (Atalar and Yılmaz 2004). In the present study, the hepatic artery terminated splitting the right and left branches after giving off a common trunk of the right and middle gastric, the side branches to pylorus and lesser omentum and the gastroduodenal arteries.

In a study carried out in rabbits (Kahvecioglu et al. 2001) the right gastric artery is ascertained to originate from the hepatic artery, forming a common trunk with the middle gastric artery. Similarly to the above report, in the present study which was conducted in New Zealand rabbits, the right and middle gastric artery had a common trunk. In the German Sheppard Dogs (Ozcan et al. 2001) and porcupines (Atalar and Yılmaz 2004), it is emphasized that right gastric artery is originated from hepatic artery. Similarly, in one of the New Zealand rabbit (12.5%) examined, the right gastric artery was ascertained to originate from just after the origin of the left gastric artery. Furthermore in one of the example (12.5%) it was originated from 6 mm after the origin of the left gastric artery in case of the two branches one after another. It is observed in literatures (Getty 1975; Dursun 1981; Ozcan et al. 2001) the right gastric artery runs into the lesser curvature of the stomach and gives small branches to it and anastomosing by the left gastroepiploic, runs into the gastrolienal ligament at the major curvature of the stomach (Blondeau 1966; Craige 1969; Malinovsky and Bednarova 1988; Cakır 1991; Ozcan et al. 2001). These findings related with distributions and anastomoses of the right gastric artery are also in agreement with the findings of the present research.

Kahvecioglu et. al. (2001) have reported that the hepatic artery is contributed to the gastroduodenal and proper hepatic arteries after 6 mm its origin. However in all of the New Zealand rabbits examined, the proper hepatic artery was not to be a branch of the hepatic artery. The gastroduodenal artery of the hepatic artery separated into the right gastroepiploic and cranial pancreaticoduodenal artery near the pars descendens of duodenum (Blondeau 1966; Malinovsky and Bednarova 1988; Cakır 1991; Kahvecioglu et al. 2001, Cirli 2006). However, in one of the New Zealand rabbit (12.5%) examined, the gastroduodenal artery was demonstrated to emanate from the celiac artery just before the origin of the left gastric artery.

In the New Zealand Rabbits, as observed in the present study, the right gastroepiploica artery anastomoses with the left gastroepiploic artery originating from lineal artery at the greater curvature of the stomach. This finding is also in compliance with previously conducted studies (Blondeau 1966; Craigie1969; Malinovsky and Bednarova 1988; Cakır 1991, Kahvecioglu et al. 2001).

Reports exist that indicate the cranial pancreaticoduodenal artery to arise from the gastroduodenal artery in rabbits (Blondeau 1966; Malinovsky and Bednarova 1988; Cakır 1991). In all of the New Zealand rabbits examined, the left hepatic artery was determined to be a branch ramifying from the left branch of the celiac artery and it anastomosed with the caudal pancreaticoduodenal artery a branch of the cranial mesenteric artery at the level of the cranial duodenal flexure.

In all of the New Zealand rabbits examined, the right branch was originated from the hepatic artery after nearly 2 cm from the gastroduodenal artery and the left branch run toward to the porta hepatis after originating from the hepatic artery. It gave off the cystic artery to the gall bladder approximately 1cm after from its origin. These findings are also in agreement with previous report of Mc Laughling and Chiacsson (1979).

CONCLUSION

In conclusion, this study was performed to determine macroanatomic information about celiac artery of the New

Zealand rabbits. By comparing the findings obtained in the present study with the previous reports, anatomical features of the celiac artery in the New Zealand rabbits were shown and it may contribute to present knowledge in this field.

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