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Original Research Article

Vascular Variations in Relation to Cysto Hepatic Triangle

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ABSTRACT

The available reports on similar studies and literatures are mainly based on the study of dissected specimens of south Indian and Western population.
The cystic artery is known to exhibit variations in its origin and branching pattern. The topographical anatomy of the arterial system of the hepatobiliary region and their anomalous origin should be considered during hepatobiliary surgeries. This knowledge is also important for interventional radiologists in routine clinical practice. [4]
Technically gallbladder surgery is much the most difficult of any abdominal surgery and inadequate appreciation of the abnormalities of this region does not lessen the risk. [7]

Key words: Cystic artery, Calot's triangle, Gallbladder, Variation, Cholecystectomy.

INTRODUCTION

In no area of the human body are the relationships as described in text books of anatomy more misleading as to constancy than the region encompassing the extrahepatic biliary ducts and blood vessels. If the frequency of operative procedures involving these structures is considered, it is vital importance for the surgeon to be alerted to the type and frequency of anomalous distribution in these ducts so indispensable to the proper drainage of the liver. [2]

The Calot's triangle is bound by the cystic duct, the common hepatic duct and the inferior border of the liver. It is an important landmark for identifying the origin of the cystic artery during laparoscopic cholecystectomy. The commonest origin of the cystic artery is the right hepatic artery, which lies on the right side of the common hepatic duct, in the Calot's triangle. [4]

Hemorrhage and bile leakage usually occur due to variants of structures of Calot's triangle and they constitute the most common cause for the conversion to open cholecystectomy that is why every surgeon should be familiar with the anatomical conditions in the Calot's triangle. [5]

Normal Anatomy

Cystic artery: The cystic artery usually arises from the right hepatic artery. It usually passes posterior to the common hepatic duct anterior to the cystic duct to reach the superior aspect of the neck of gallbladder and divides in to superficial and deep branches. [3]

Calot's triangle: The near triangular space formed between the cystic duct, the common hepatic duct and the inferior surface of segment V of the liver, is commonly referred to as Calot's triangle. This space contains the cystic artery as it approaches the gallbladder, the cystic lymph node, lymphatics from gallbladder, one or

two small cystic veins, the autonomic nerves running to the gallbladder and some loose adipose tissue. Appreciations of the variation in ductal and arterial anatomy as they relate to the triangle are of considerable importance during excision of the gallbladder. [3]

MATERIALS AND METHODS

We have studied total 40 specimens of liver with extra hepatic biliary apparatus and blood vessels in and around Calot's triangle. The study was conducted only by detailed dissection method. We have dissected and removed the liver with its extra hepatic biliary duct system from the cadavers in the department of Anatomy JJMMC Davangere. Then cleaned the specimens from surrounding fascia and dried them under the shade. We used Camlin synthetic paint mixed with araldite to paint the various structures, Vein with Blue color, Artery with Red color and Gall bladder and duct system with Green color with the help of 2 no. brush. Finally we took the photographs of the specimens.

RESULTS AND DISCUSSIONS

ORIGIN OF CYSTIC ARTERY

Sl No	Author	In the Calot's triangle	Out side the Calot's triangle
1	Nicholas Michels	81%	----
2	Daseler	69.8%	----
3	Keith Gammon & Jacob	48.5%	30.3%
4	Present Study	37.5%	62.5%

COURSE OF CYSTIC ARTERY

Sl No	Author	Anterior to C H D	Posterior to C H D	Anterior to C D	Posterior to C D
1	Daseler	20%	---	1%	---
2	Keith Gammon & Jacob	27.2%	12.1%	---	---
3	Present Study	22.5%	37.5%	45%	52.5%

Incidence of origin of cystic artery in the Calot's triangle is less and outside the Calot's triangle is more in the present study than other authors.

In the present study course of cystic artery anterior to C H D is on par with other authors.

Course of cystic artery posterior to C H D shows a higher incidence in the present study compared to other authors.

In the present study course of cystic artery anterior to CD is more compared to other authors.

Practically all the accidents to ducts and vessels occur during the operation of cholecystectomy with or without choledochotomy. It is obviously the duty of every surgeon to make him familiar with both the normal and abnormal anatomy of these parts. [1]

Laparoscopic cholecystectomy has been accepted as the preferred method of treatment of gall bladder stones in healthy individuals. During laparoscopic cholecystectomy dissection of a limited area is magnified on the video monitor who indicates that a detailed anatomical knowledge of the possible variations in the anatomy of the cystic artery and its branches is very important to the surgeon. The cystic artery arising outside the hepatobiliary triangle usually passes ventral to the CBD and in some cases it may even be inferior the cystic duct, thus becoming the first structure encountered in dissection of the inferior border of the hepatobiliary triangle by laparoscopy and has a chance of accidental injury. It is obvious that too proximal ligation of such a cystic artery would endanger the CBD. [6]

Abbreviations

Common Hepatic Duct - C H D
Cystic Duct - C D

Authors Declaration

The author warrants that the article is original, is not under consideration by any other journal and has not been previously published and takes responsibility for the content. Furthermore, I warrant that all investigations

reported in my publication were conducted in conformity with the recommendations from the International guiding principles for biomedical research involving animals.

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