

ORIGINAL ARTICLE

Gross Anatomical Variations of Cystic Duct: A Cadaveric StudySYEDA SHABEEH RUBAB¹, WARISHA IFTIKHAR², RAAFEA TAFWEEZ KURAISHI³, SAIRA SALMAN⁴^{1,2,4}Demonstrator anatomy, King Edward Medical University, Lahore³Professor of anatomy, King Edward medical university, Lahore

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ABSTRACT**Aim:** To determine the frequency of anatomical variations of cystic duct.**Study design:** Descriptive Case Study**Place and duration of study:** Anatomy Department of King Edward Medical University Lahore and duration of study was from August 2018 to December 2019.**Methodology:** The dissection of 43 cadavers was done and extra hepatic biliary tract was explored. The length of cystic duct and site of insertion of cystic duct in common hepatic duct was noted. The length of cystic duct <1 cm was taken as short cystic duct and >4cm as long cystic duct. The insertion of cystic duct near porta hepatis is high insertion and near duodenum is low insertion.**Results:** The mean length of cystic duct was 2.67 ± 0.71 cm. Out of 43 cadavers 2(4.7%) of cadavers had short cystic duct. 41(95.3%) of cadavers had normal length of cystic duct. There was no cadaver observed with long cystic duct. Out of 43 cadavers 39(90.7%) of cadavers had mid insertion of cystic duct, 4(9.3%) of cadavers with high insertion of cystic duct and no cadaver with low insertion.**Conclusion:** The most common anatomical variation of cystic duct is high insertion of cystic duct 9.3%.**Keywords:** Anatomical variations, cystic duct, cholecystectomy.**INTRODUCTION**

The cystic duct joins the neck of gallbladder to the common hepatic duct. The cystic duct may run a straight or a fairly convoluted course. The length of cystic duct is variable and ranges from 1-4cm.¹ The cystic duct is 2-3mm wide and it can dilate in case of passage of stone. The cystic duct ends by joining the common hepatic duct on right side at an acute angle to form bile duct.² It runs parallel to common hepatic duct for a short distance before joining it. At the site of union of cystic duct with common hepatic duct it shows significant variations³, primarily variations in length, level and side of insertion of cystic duct i.e. long cystic duct >4cm, short cystic duct <1cm,⁴ high insertions (near porta hepatis), low insertion (near the duodenum)⁵ and left insertion.⁶

METHODOLOGY

This descriptive cross sectional study was conducted in cadavers of Anatomy department of King Edward Medical University Lahore from August 2018 to December 2019 after receiving approval from the institutional ethical and research committee of the university. The sample size was 43. The age range of cadavers was 20-60 years which was confirmed on postmortem report. The cadavers with absent gallbladder were not included in the study. The dissection of 43 cadavers was done and extra hepatic biliary tract was explored. The duodenum and pancreas were also dissected with the liver to see the site of insertion of cystic duct. The duodenum and head of pancreas were turned to the left and lienorenal ligament was cut to dissect out the tail of pancreas. In this way en-bloc dissection of liver, duodenum and pancreas was done. The specimens were preserved in 10% formalin and placed in the jar. The length of cystic duct was measured and site of insertion of cystic

duct in common hepatic duct was noted. The length of cystic duct was measured by using silk thread and it was imposed on a measuring scale and the value was expressed in cm. The data was entered and analyzed using SPSS version 22.

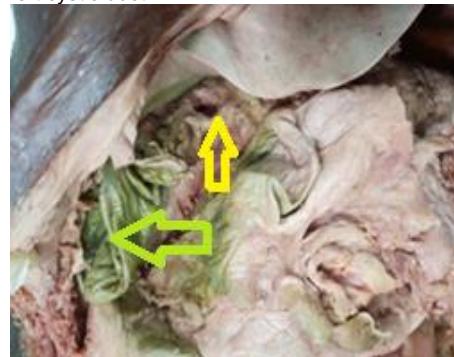
RESULTS

The detail of results is given in tables 1

Table 1: Length and insertion of cystic duct

Length of Cystic duct	Mean	SD
Cm	2.67	± 0.71
Range of length of cystic duct (cm)	N=	%age
0-1	2	4.7
1-2	7	16.3
2-3	21	48.8
3-4	13	30.2
Short Cystic Duct <1cm	2	4.7
Normal Cystic Duct 1-4cm	41	95.3
Long Cystic Duct >4cm	0	0
High insertion of cystic duct	4	9.3
Mid insertion of cystic duct	39	90.7
Low insertion of cystic duct	0	0

Fig: a. Short cystic duct.



Received on 13-03-2021

Accepted on 26-06-2021

b. Mid insertion of cystic duct



c. High insertion of cystic duct with short cystic duct



Key: Cystic duct (yellow arrow). Gall bladder (green arrow). Common bile duct (black arrow). Porta hepatis (red arrow)

DISCUSSION

In this study, the mean length of cystic duct was 2.67 ± 0.71 cm. The mean length of cystic duct observed in other countries is similar to this study. In 2013, Eftekhar V et al⁸ studied anatomical variations in extra hepatic bile ducts in Iranian populations and mean length of cystic duct observed was 2 cm. Mohamed Ahmed et al⁹ in 2019 measured length of cystic duct in Sudanese population. The mean length of cystic duct observed in cadavers was 2.06 ± 1.03 cm. Nahar N et al⁷ in 2011 measured length of cystic duct in Bangladesh population and its mean was 2.43 ± 0.90 cm.

In the present study, 95% of cadavers had normal length of cystic duct. The short cystic duct was present in 5% of cadavers. Talpur KA et al⁶ studied anatomical variations of extrahepatic biliary tract in 2.67% of case near to the present study. Similar to present study, Awazli LG also observed 2% of cases with short cystic duct in Iraqi population with biliary stone.¹⁰ Wu YH reported the two cases of cholecystectomy with anatomical variations of cystic duct. In one case there was long cystic duct and narrow curved lumen. In the other case during cholecystectomy the cystic duct was misdiagnosed as short cystic duct draining in right hepatic duct. After surgery patient developed abdominal pain, T-tube cholangiography was done and diagnosed as long cystic duct with low level with left sided insertion in common bile duct¹¹.

In the present study, 9% of cadavers had high insertion of cystic duct and in 2.3% cadavers, there was type B variant (trifurcation) of cystic duct. Taghavi et al also

studied anatomical variations of extrahepatic biliary tract in Iranian population and noticed high incidence of triple confluence in 21.5% of population¹³. There was no case reported with low site of insertion of cystic duct in the present study. This is in contrast with results of OWAIS M et al, observed low insertion of cystic duct in 4% of cadavers.¹⁴

CONCLUSION

Short cystic duct and high insertion of cystic duct are common anatomic variants in our population. These anatomical variations are more prone to injuries during cholecystectomy.

Conflict of interest: Nil

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