



Variations in the Termination of Cystic Duct by gross Dissection Method: A Report of 100 Cases of Odishan Population

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Abstract

Introduction: *The Cystic duct is about 3 cm in length but variable. It terminates usually in the supraduodenal region into the R.H.D .But on many occasions it displays aberrations from the normal. The study is an attempt to find out the incidence of cystic duct termination by gross anatomic dissection.*

Methods: *The study was carried out in 100 Cadaveric liver specimen with attached extrabiliary apparatus. The sexual frequency of 45 male cadaveric and 55 female cadaveric specimens. The termination of cystic duct was studied and photographed.*

Results: *90% of cystic duct terminated in the RHD. But a few opened into the LHD i.e 3% opened into the LHD.A case of double cystic duct into the RHD and a case of absent cystic duct were observed. One case of double cystic duct opening into the RHD and CHD was noted, 2 % cases of segmental ducts opening into the gall bladder was observed.*

Discussion: *The study was conducted to observe the percentages of different termination of cystic duct, which is quite important for G.I. surgeons operating in this area. The study has been compared with similar studies on different ethnic groups in the world.*

Keywords: *cystic duct, right hepatic duct, Left hepatic duct, Common hepatic duct, Laparoscopic cholecystectomy, sessile duct, common bile duct.*

Introduction

The cystic duct is about 3 cm in length but variable in lumen is usually 1-3 mm in diameter. The mucosa of the cystic ducts arranged in spiral folds known as the valves of Heister. The cystic duct joints the common hepatic duct in its supraduodenal segment in 80% of cases. Its union is usually on the right side of the common hepatic duct about 1 to 2 cm above duodenum.^(1,2)

Cystic duct variations have been described in the literature based on its length, course and site of insertion with CHD. The variations of clinical importance are:

- i) low insertion of cystic duct
- ii) parallel course of cystic duct with CHD
- iii) Absent or short cystic duct (length<5mm)
- iv) Aberrant drainage of cystic duct to RHD or LHD

- v) Anterior or posterior spiral course medial insertion
- vi) Double cystic duct ^(3,4,5,6)

It is important for surgeons operating in these regions to be acquainted with the variations to prevent biliary ductal injury. The advent of laparoscopic procedure increasingly being done in the calot's triangle area, lends its weight to this study.^(7,8)

Materials and Methods

Gross anatomic dissection was performed on 100 embalmed liver specimens with attached extrabiliary apparatus (n=100) out of which 45 specimens were from male cadavers 55 specimens were from female cadavers. The variation of termination of cystic duct was studied and photographed.

Results

The cystic duct terminated with the common hepatic ducts in 90% cases of which 40% (n=40)

were from male cadavers and 50% (n=50) were from female cadavers.

In 3% cases the cystic duct opened into RHD of which 2% (n=2) were from male cadaver and 1% (n=1) from female cadavers.

The cystic duct opened into the LHD in 2% cases out of which 1% (n=1) were from male cadavers and 1% (n=1) from female cadavers.

In 1% case (n=1) double cystic duct opened into the RHD in that of a female cadaver specimens.

In 2% cases segmental ducts with gall bladder forms CBD of which 1% (n=1) were in male cadaver specimen and 1% in female cadaver specimen.

Absence of cystic duct was found in 1% (n=1) case in that of a female cadaveric specimen.

Double cystic duct opening one into the RHD and other into the CHD was found in 1% of cases and it was in case of a male cadaver specimen.

Variation in termination of cystic duct by Gross dissection in 100 cadaveric specimen

	Total	Male	% frequency	Female	% frequency
Opening to CHD	90	40	40	50	50
Opening to RHD	3	2	2	1	1
Opening to LHD	2	1	1	1	1
Double cystic duct opening to RHD	1	0	0	1	1
Segmental ducts with gall bladder forms CHD	2	1	1	1	1
Sessile or absent cystic duct	1	—	—	1	1
Double cystic duct one to RHD and other to CHD	1	1	1	—	—

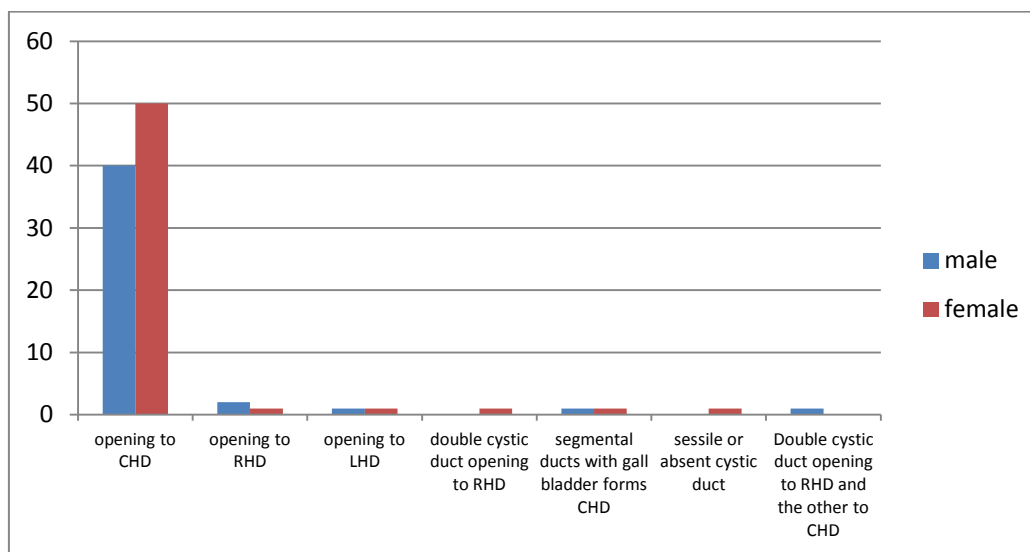


Fig.1 Bar graph showing the percentages of termination of cystic duct



Fig-2: Cystic duct opening to C.H.D.

R.H.D.-Right hepatic duct, L.H.D-Left hepatic duct, C.H.D.-Common hepatic duct, C.D.-Cytic duct



Fig: 3- Cystic duct opening to left hepatic duct. RHD-Right hepatic duct, L.H.D.-Left hepatic duct, C.D.-Cystic duct, G-Gall bladder

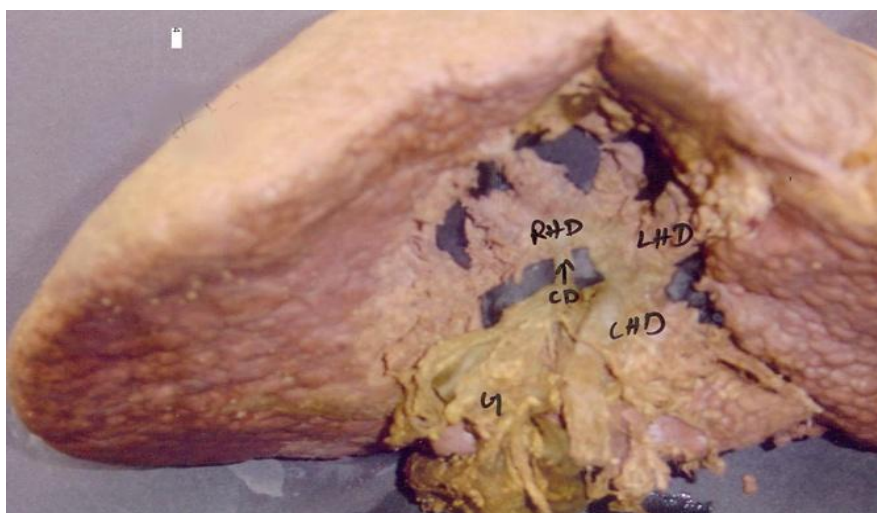


Fig:4- Cystic Diet opening to R.H.D., R.H.D – Right Hepatic Duct, L.H.D – Left Hepatic Duct, C.H.D.- Common Hepatic Duct, CD – Cystic Duct, G – Gall Bladder

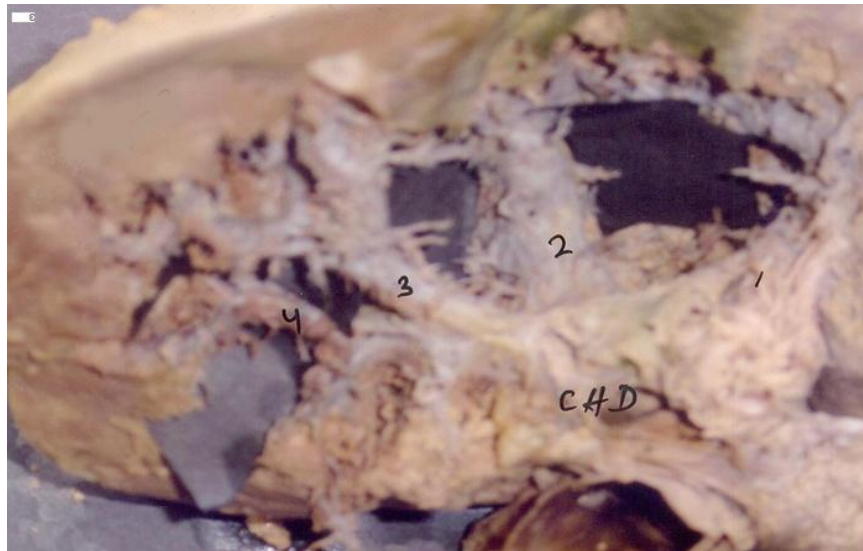


Fig: 5- Confluence of Segmental Ducts, 1,2,3,4 : Segmental Ducts, C.H.D.- Common Hepatic Duct

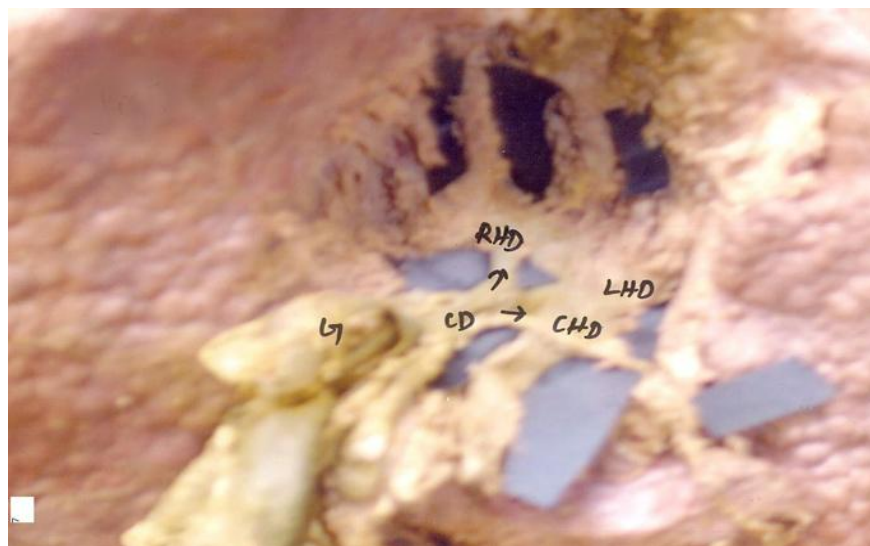


Fig: 6 Double Cystic Duct opening one to right hepatic duct & one to Common Hepatic Duct, R.H.D – Right Hepatic Duct, L.H.D – Left Hepatic Duct, C.H.D.- Common Hepatic Duct, CD – Cystic Duct, G – Gall Bladder

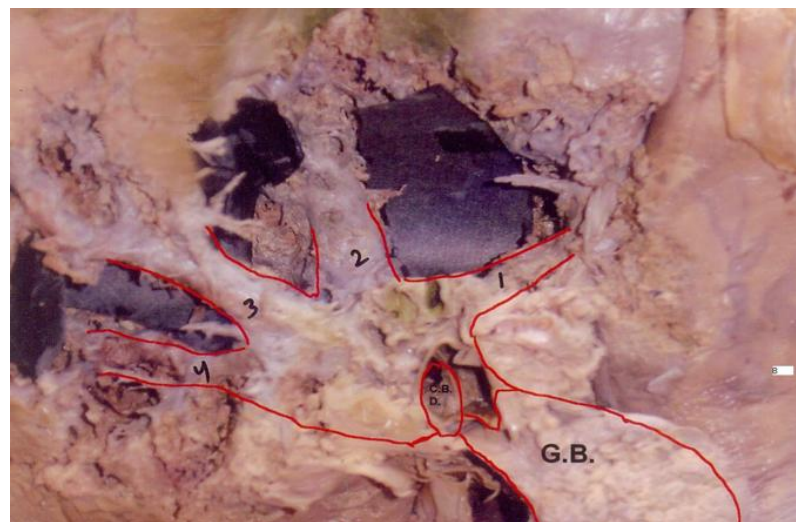


Fig 7: Sessile or Absence of Cystic Duct.1,2,3,4-segmental ducts,

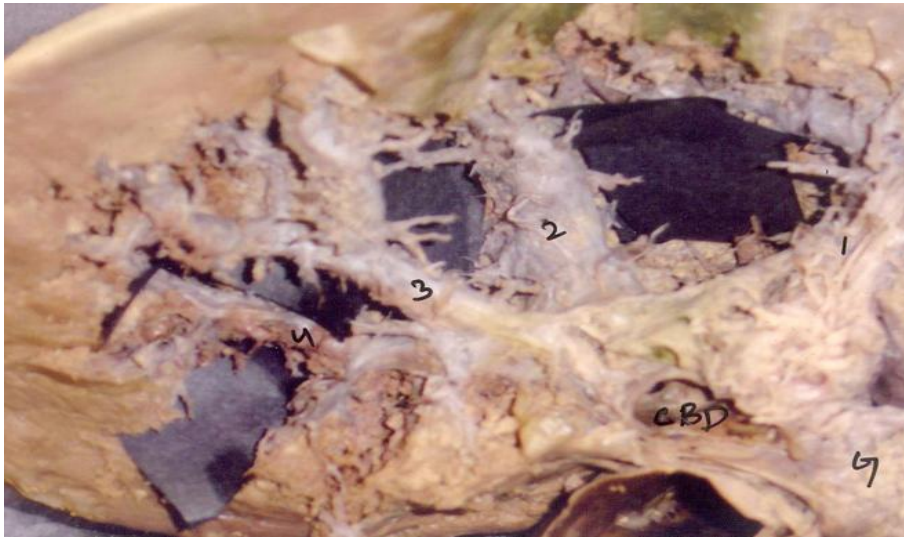


Fig 8 : Segmental ducts with gall bladder forms C.B.D.

G.B.-Gall bladder,1 to4-segmental ducts, C.B.D-Common bile duct

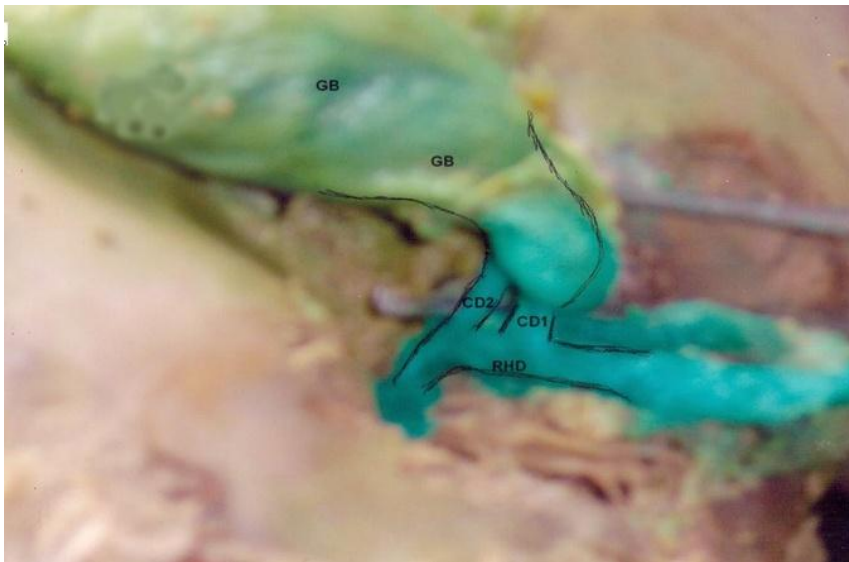


Fig 9 : Double Cystic Duct opening to Right hepatic duct, G.B- Gall Bladder,

C.D.1,2 – Cystic Duct 1 & 2, R.H. D- Right Hepatic Duct



Fig10: Cystic duct opening to Left hepatic duct1-L.H.D.,2-R.H.D.,3 to7-segmental ducts,

C.D.-Cystic duct

Discussion

The cystic duct is found to terminate by opening into the RHD, in 3 specimens of the 100 dissection where the sexual frequency is found to be 2% in male and 1% in female (fig-4). The present finding is a little higher than the finding reported by Daseler et al (1947) and Benson et al (1976) who have reported similar arrangement in 1.5% of cases.^(9,10) Sawargi R et al. reported in 0.8% of cystic duct opening into RHD in a series studying cystic duct variations by MRCP. Khan et al. and Talpur et al. also reported similar results of cystic duct opening to RHD in 1.7% and 1.78% cases respectively^(22,23).

The cystic duct has been found to terminate to the left hepatic duct in 2 dissection in the present series with a percentage frequency of 1% for male and 1% for female (fig-10). Cachoiera E et al .found in his series all the cystic duct opening to CHD except 1 case opening into LHD .Adam et al. (1966) have observed very rarely the termination of the cystic duct with the left hepatic duct. The present incidence are little high according to the available literature.⁽⁷⁾

The double cystic duct opening into the right hepatic duct has been observed in 1 dissection, that of a female cadaveric specimen(Fig-9) .This condition is very rare with very few cases reported in world literature.^(18,19,20)

Double cystic duct i.e. one draining into the RHD and one to the CHD has been observed in 1 dissection (1%) in a specimen belonging to a male cadaver. The available literature is silent about such finding, made in the present series.

Double cystic duct is a extremely rare variant only 16 cases have been reported in world literature.⁽¹⁵⁾

The present series makes one more addition to such cases.

In the present series in 2%cases four segmental ducts have been found to open directly into the gall bladder and consequently forming the C.B.D (Fig-5). with a percentage of frequency of 1% in male specimens and 1% in female specimens. The available literature do not report about such finding.

In one cadaveric specimen the cystic duct has been found to be a sessile one, which can be called as absent. Such absent cystic duct was found in a female cadaver specimen (1%,n=1) (Fig-70)

Lichtenstein et al (1937) have reported apparent congenital absence of cystic duct and gall bladder but did not record the number or percentage of such absence⁽¹²⁾ Hicken et al. (1949) have reported such absence in his series without mentioning the number and percentage⁽¹³⁾.Gerwig et al .(1961)reported the absence of cystic duct and gall bladder in 6 cases in their series but did not mention the total number of cases studied by them.⁽¹⁴⁾ Adam et al.(1966) reported the absence of cystic duct in one case.⁽¹¹⁾ Hayes et al. reported 2 cases (0.01%) of congenital absent cystic duct among 189 extrahepatic biliary anomalies identified in 400 patients.⁽¹⁶⁾ Ramah et al. noted only 3 cases (0.25%) of congenitally absent cystic duct among 12 extra hepatic biliary anomalies in 2125 patients.⁽¹⁷⁾

Conclusion

The variants of cystic duct as regards in its termination are of many types but the incidence is relatively low. But that doesn't preclude future study of this region and structure as it would reveal many more variants and provide a roadmap to G.I. surgeons operating in this region. This could avoid any fatal and time consuming misadventure in the form of biliary injury.

R.H.D. Right Hepatic Duct

L.H.D. Left Hepatic Duct

C.H.D. Common Hepatic Duct

C.B.D. Common Bile Duct

Conflict of Interest-

There is no conflict of interest to be declared by the author.

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