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DEVELOPMENTAL ANOMALIES AND MORPHOLOGICAL VARIATIONS OF GALL BLADDER- A CADAVERIC STUDY

Anatomy

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ABSTRACT

Introduction- The Gall Bladder (GB) is a hollow viscus sac, situated in a fossa in the right hepatic lobe inferior surface. It extends from the right end of porta hepatis to the inferior border of liver. It is 7 - 10cm long, 3 cm broad and capacity is 30 – 50 ml. It has 3 parts Fundus, Body and Neck.
Materials and Methods-This study was carried on 50 GB specimens in the Department of Anatomy, GITAM Institute of Medical Sciences & Research, Visakhapatnam. The GB was carefully dissected and cleaned to observe developmental anomalies and morphological variations of GB.
Results-The developmental anomalies like Hartmann's pouch, Intrahepatic Hypoplastic GB were observed. The length and breadth GB ranged from 4.9 - 9.5 cm and 2.0 - 4.8 cm, shapes of GB most common pear shaped(64 %), flask shaped(20%), cylindrical shaped(12%) and hour glass(4%).
Conclusion- The knowledge of this study will help the laparoscopic surgeon to take preventive measures before cholecystectomy and the radiologist to differentiate the normal from anomalies.

KEYWORDS

Gall Bladder, Hartmann's Pouch, Laparoscopic Surgeon, Cholecystectomy

INTRODUCTION

The Gall Bladder (GB) is a hollow viscus sac organ situated obliquely on the inferior surface of in the right hepatic lobe. It extends from the right end of porta hepatis to the inferior border of liver. The embryologic origin of the gallbladder is from the hepatic diverticulum, an out-pouching of the primitive foregut. During this early development, a number of malformations may occur like double gallbladder, bilobed (septate) gallbladder, diverticulum of the gallbladder, or gallbladder agenesis. Anomalous positions like intrahepatic gallbladder, left sided gallbladder, retro displacement of the gallbladder, transverse position of the gallbladder, and floating gallbladder. The GB is 7 – 10 cm long, 3 cm broad and its capacity is 30 – 50 ml. It has 3 parts Fundus, Body and Neck. The Fundus is extending beyond the inferior border of the liver. The body extends from the fundus to the neck. The neck is narrow it extends from the body to cystic duct. From the neck a small recess may project down and back towards the duodenum. Often termed Hartmann's' pouch.

The gall bladder varies in size and shape, in rare cases it may be duplicated, with two or combined cystic ducts. In some cases though the duct is present, the gallbladder is absent. Anatomic variations of gall bladder & biliary tract are important during any operative procedures because failure to recognize them may lead to inadvertent ductal ligation, biliary leaks and strictures after laparoscopic cholecystectomy. The present study describes developmental anomalies and morphological variations of the gall bladder.

MATERIALS AND METHODS

This study was carried on 50 liver specimens obtained from formalin fixed cadavers in the Department of Anatomy, GITAM institute of Medical Sciences and research, Visakhapatnam, Andhra Pradesh. The parameters studied were the developmental anomalies and morphological variations of GB like maximum length of gall bladder, maximum transverse diameter, length of fundus, shape, folds of gall bladder. The length and breadth were measured by using sliding vernier calipers. To obtain the length of the gallbladder, it was measured from fundus to neck. The maximum breadth of the bladder was measured. Part of the gall bladder i.e. fundus that lie below the inferior border of liver was noted. The shape of the gall bladder was noted in all the specimens. Its position and any external variations if present, was also noted. Photographs of the variations of gall bladder were taken.

RESULTS

Developmental anomalies of gall bladder:

Hartmann's pouch was observed in 1 specimen, Intrahepatic Hypoplastic GB was observed in 1 specimen.

Maximum length of gall bladder:

Average length of gall bladder was found to be 7.4 cm. The smallest gall bladder was 4.9 cm in length and the largest had length 9.5 cm.

Maximum transverse diameter of gall bladder:

Mean breadth of gall bladder was 3.29 cm. The shortest transverse diameter was 2.0 cm and largest 4.8 cm.

Length of fundus:

The average length of gall bladder below the inferior border of liver was found to be 0.96 cm.

Shape of gall bladder:

The gall bladders were classified according to their shapes. Various shapes observed were pear shaped, flask shaped, cylindrical shaped, hourglass shaped. The commonest shape found was pear shaped (32/50, 64%). Their incidences are shown in the Table I.

Table 1: Showing different shapes of gall bladder

SHAPE	NUMBER	PERCENTAGE
Pear shaped	32	64%
Flask shaped	10	20%
Cylindrical	6	12%
Hour glass	2	4%

External appearance of gall bladder:

Foldings of neck and fundus were noted. Folding of neck was noted in 4 out of 50 specimens of Gall Bladder but folding of fundus was not founded.

Figure 1: Gall bladder with Hartmann's pouch and Intrahepatic Hypoplastic Gall bladder

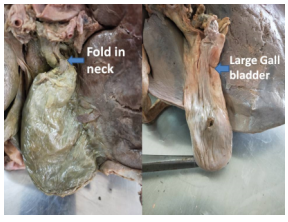

Figure 2: Fold in Neck and Large Gall bladder

Figure 3: Different shapes of gall bladder (A) pear Shaped (B) Flask Shaped (C) Cylindrical Shapes

DISCUSSION

In present study 50 GB were carefully examined for Hartmann's Pouch. Hartmann's Pouch was detected in 1 (2%) gall bladder. Brunicardi in 2010 stated that the neck of the gallbladder follows a gentle curve, the convexity of which may be enlarged to form the infundibulum or Hartmann's pouch. Laila Farzana Khan was detected 45 Hartmann's Pouch out off 62 (72.58%) gall bladders. Rajasekhar D[2] in 2017 was detected a total of 9 (9%)Hartmann's Pouch out off 100 gall bladders. In both studies are having much higher percent of Hartmann's Pouch than that in the present study. There is a significant association between the presence of Hartmann's pouch and Gall stones. In majority of cases Gallstone are found in Hartmann's Pouch. So findings of study regarding Hartmann's pouch may serve as a useful tool for surgeons, gastroenterologists, pathologists, and radiologists to understand the anatomy for accurate diagnosis, successful treatment and better prognosis.

In present study 1 (2%) Gall Bladder is Intrahepatic Hypoplasia. Intrahepatic hypoplastic gallbladder is a rare congenital anomaly. A diagnosis of agenesis or hypoplasia of gallbladder can only be confirmed with histology, intraoperative cholangiography, or laparoscopy. In particular cholangiography is an essential tool to identify stones in the common bile duct, an ectopic gall bladder, an intrahepatic gallbladder. Preoperative investigations such as MRCP and intraoperative cholangiography can be useful tools to avoid any unnecessary surgical complications. McNamee estimated that 60% of adult patients with this anomaly had gallstones. Intrahepatic gall bladder (GB) is an uncommonly encountered condition in clinical practice characterized by ectopic location of GB within the hepatic parenchyma. This condition not only produces difficulty in clinical diagnosis of various GB diseases especially cholecystitis and carcinoma but also in their management including cholecystectomy.

The measurements of the gall bladder and its shape reported by different authors are summarized in Table 2. The results of the present study are similar to that of the previous authors. In the present study fifty gall bladder specimens were studied for the morphology. The length and breadth of gall bladder ranged from 4.9 - 9.5 cm and 2.0 - 4.8 cm respectively. Size of gall bladder varies in different diseased conditions as well as in some physiological Conditions. The size of GB may increase after vagotomy, diabetes, Pregnancy, sickle cell disease, after cystic duct or common bile duct obstruction. Shapes of GB vary tremendously and various authors have described various shapes. We found pear shaped GB as most common (64 %), flask shaped GB (20%), cylindrical shaped GB (12%) and hour glass GB (4%).

Table 2: Showing Measurements and Shape of Gall Bladder Reported by Different Authors

Author	Number of Specimens	Length	Breadth	Shape
Anjankar[3] (2013)	90	7 -10 cm	2 - 5 cm	The commonest shape found Was pear shaped (74/90, 82.22%).
Rajendra R[4] (2015)	78	4 -11 cm	2.5 - 5 cm	Pear (53.2%), cylindrical (11.4%), hourglass (6.3%) oval (11.4%) others (16.5%)
Desai J[2] (2015)	50	4.5 -11 cm	2.8 - 5 cm	Pear (84%), cylindrical (10%), hour-glass (2%), retort (4%)
Sreekanth C[3] (2016)	100	3.3 - 10 cm	2.0 - 5.0 cm	Pear shaped (80/100, 80%).
D D Neginhal[2] (2018)	50	5.2 - 8.8 cm	2.0 - 5.6 cm	Pear (46%), flask (24%), cylindrical (20%), hourglass (4%), Irregular (6%)
Present study (2019)	50	4.9 – 9.5 cm	2.0 – 4.8 cm	Pear (64%), flask (20%), cylindrical (12%), hourglass (4%),

CONCLUSION

The developmental anomalies and morphological variations of gall bladder are not common but can be of clinical importance and surprising to the surgeons if present. The knowledge of this study will help the laparoscopic surgeon to take preventive measures before cholecystectomy and the radiologist to differentiate the normal from anomalies.

REFERENCES

1. Anjankar Vaibhav Prakash, Panshewdikar Pradnyesh N, Joshi DS, Anjankar Ashish Prakash, A CADAVERIC STUDY INVOLVING VARIATIONS IN EXTERNAL MORPHOLOGY OF GALL BLADDER Int J Med Res Health Sci. 2013;2(2):239-242
2. Chakka Sreekanth, Makani Thanuja Kumari, Lattupalli Hema, Variations In The External Morphology Of Gall Bladder: A Cadaveric Study In South Coastal Population. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 15, Issue 9 Ver. IX (September). 2016), PP 14-20
3. Chandrasekar G, Vivek Nagappa, Cholelithiasis in an intrahepatic gallbladder, International Surgery Journal, 2017 Sep;4(9):3177-3179 ISSN
4. Desai J , Bhojak N. Study of Variations in External Morphology of Gall Bladder in Cadavers BJKines-NJBAS.2015;7(1):29-33.
5. D D Neginhal, U K Kulkarni. Morphology of gall bladder - A cadaveric study. MedPulse – International Journal of Anatomy. December 2018; 8(3): 44-47.
6. Gross, R. E. (1936). Congenital anomalies of the gall bladder. Archives of Surgery, 32(1), 131–162.
7. Lakshmi Kumari, P.V.S.S.Vijaya Babu. Hartmann's Pouch – A study in North Coastal Andhra Pradesh, India, IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 13, Issue 4 Ver. V. (Apr. 2014), PP 61-62
8. Laila Farzana Khan, Humaira Naushaba, Jahanara Begum. Study of Hartmann's Pouch of the Gallbladder. Delta Med Col J. Jul 2014; 2(2)
9. McNamee EP. Intrahepatic gallbladder. AJR. 1935; 33:603-10.
10. Nahar N, Ara S, Rahman M, Shahriah S, Afroz H et al. Presence of hartmann's pouch in human gall bladder. Bangladesh Journal of Anatomy. 2012; 10(2):57-8.
11. Nayak SB, Snigdha Mishra, Bincy M. George, et al. A peculiar liver with surgically and radiologically important variations: a case report. Anat Cell Biol. 2013 Mar; 46(1): 82–84.
12. Rajasekhar D, Sumana R et al. Comparative study of Human Gall Bladder variations in south Indian population. IJSR, Vol-6, Issue-4, April-2017.
13. Rajendra R, Makandar UK., Tejaswi HL, Patil BG. Morphometric Study of Gall Bladder In South Indian PopulationIndian Journal of Forensic and Community Medicine. 2015; 2(1):35-42
14. Shilpi Gupta Dixit, Seema Dhuria and Surajit Ghatak. Absent quadrate lobe of liver: anatomical and clinical relevance, Int J Anat Var (IJAV). 2016; 9: 53–54