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Original Research Article

INCIDENCE OF FLOATING / WANDERING GALL BLADDERS: A CADAVERIC STUDY AND ITS CLINICAL IMPLICATIONS

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ABSTRACT

Background and Aims: A floating gall bladder is a rare anatomical variation. It is most of the times presented as a case report. A gallbladder that is completely covered with peritoneum is called a floating gall bladder or wandering gallbladder. It is usually suspended from the inferior surface of the liver by a fold of mesentery. The non-fixed gallbladder can undergo complete torsion or incomplete torsion in a clockwise or anti-clockwise directions. The present study finding out the incidence of floating / wandering gallbladder is the first of its kind. Only if aware, the medical personnel can take up the unusual situations with confidence rather that surprise lessening the morbidity and mortality rates in treating them.

Materials and Methods: The present study was carried on 45 formalin fixed cadaveric [40 Male and 5 Female] livers.

Results: In the present study 2 (4.44%) floating gall bladders were identified after observing the inferior surfaces of 45 formalin fixed liver specimens. One in Male and other in a Female Cadaver.

Conclusion: A floating gall bladder is a rare variation occurring at the inferior surface of the liver. A variant anatomy illuminates embryology. It is one of the reasons for acute cholecystitis, torsion and wandering abdominal pain. The mortality rates for patients with a necrotic gallbladder is 10 times higher. The knowledge of this variation is necessary for the anatomists, gastro hepatic surgeons and radiologists.

KEY WORDS: Floating Gallbladder, Inferior Surface, Torsion.

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INTRODUCTION

The gallbladder is green coloured elongated pear-shaped sac measuring about 10cm x 3cm with 30-50ml Capacity present on the inferior surface of the right lobe of the liver. It stores and concentrates the bile. It has 3 Parts, the fundus, body and neck. The neck is the narrow upper end of the gallbladder which continues as the cystic duct. The postero-medial wall of the neck shows Harthman's pouch which may lodge gallstones. During development abnormal migration of the caudal bud – pars cystica (Future gallbladder and cystic duct) to the ventral diverticulum may cause an anomalous gallbladder position. If the caudal bud- pars cystica advances beyond the cranial bud – pars hepatica (Future liver), it may become buried in

the liver substance, creating an intrahepatic gallbladder. If the caudal bud lags behind the cranial bud, a floating gallbladder is created. [1] it is also called as wandering gallbladder as it is suspended by a long fold of mesentery which permits mobility.

MATERIALS AND METHODS

The present study was carried on 45 cadaveric [40 Male and 5 Female] livers. The formalin fixed livers were used for prosection during the dissection classes of 1st MBBS premedical students of Shadan Institute of Medical Sciences, Teaching Hospital and Research Centre, Hyderabad, Telangana. The inferior surfaces of the harvested livers were meticulously observed for the presence of floating gall bladder and accordingly photographed.

RESULTS

In the present study floating gall bladders were seen on the inferior surface of two livers. One liver from a male cadaver and the other from a female cadaver revealed them. Both the gall bladders were normal having a fundus body and neck. The gallbladder seen on the inferior surface of the liver harvested from the female cadaver was displaced downwards from its shallow fossa. An extensive fold of mesentery was seen around the cystic duct. Fig1.[1] when the liver was placed in the anatomical position the gallbladder in toto (as a whole including its fundus, body and neck) was seen displaced out of the inferior surface of the liver being suspended by a long fold of mesentery. Fig [2]. It could be easily lifted up and away from the gall bladder fossa which was just a shallow depression. The fold of mesentery measuring about 2.2 cms long and 1.5 cms wide was seen covering the cystic duct also. This fold of mesentery suspended and permitted mobility to the gall bladder which could be lifted up and away from its shallow fossa and moved to the right or left. Fig [3]. The second floating gall bladder that was seen on the inferior surface of the liver harvested from a male cadaver was dark green in colour with the fundus projecting out of the inferior border as seen in a normal liver Fig [4]. But the fundus and body could be lifted up from its deep fossa. This was possible as the gallbladder was completely covered by peritoneum. The gallbladder fossa which was deep and darkly stained Fig [5]. As the gall-bladder did not have a long fold of mesentery it was not seen suspended or displaced from the inferior surface. Due to the greater depth of the fossa the gallbladder was apparently lodged in it.

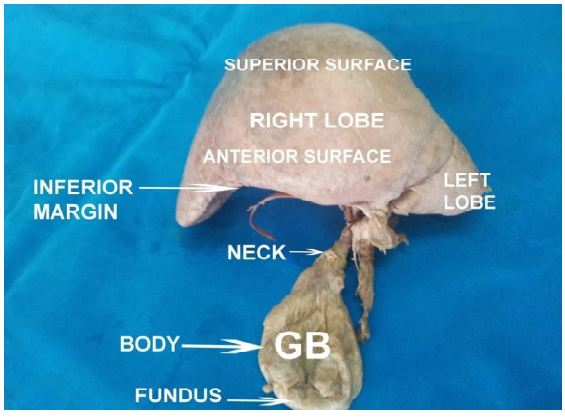
Table 1: Showing the incidence of floating gallbladder in the present study.

Floating Gallbladder	Number	Percentage
Present	2	4.44%
Absent	43	95.56%

Fig. 1: Showing the floating gallbladder suspended by a long fold of mesentery on the inferior surface of the liver harvested from a female cadaver. The body and fundus of the gallbladder hanging out of its fossa.

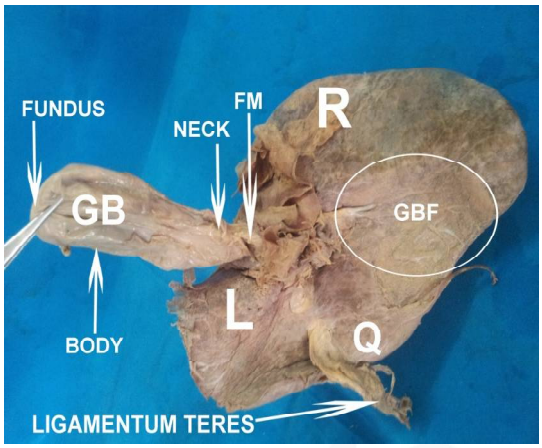
GB- Gallbladder
L-Left Lobe
C-Caudate Lobe
IVC- Inferior Vena Cava
FM- Fold of Mesentery
R-Right Lobe
Q- Quadrate Lobe

Fig. 2: Showing the Liver in Anatomical position. The floating gallbladder in toto (with all its parts) displaced out of the inferior surface of the liver. The long and wide mesentery covering the cystic duct is suspending and permitting mobility.



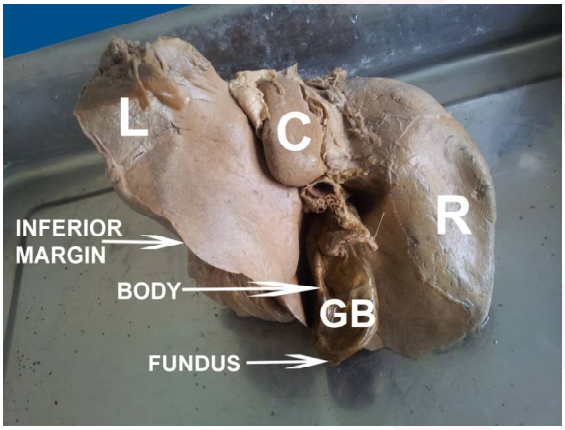
GB-gallbladder

Fig. 3: The gallbladder in toto lifted up from its fossa. The gallbladder fossa (shown in the circle) seen as a shallow depression.



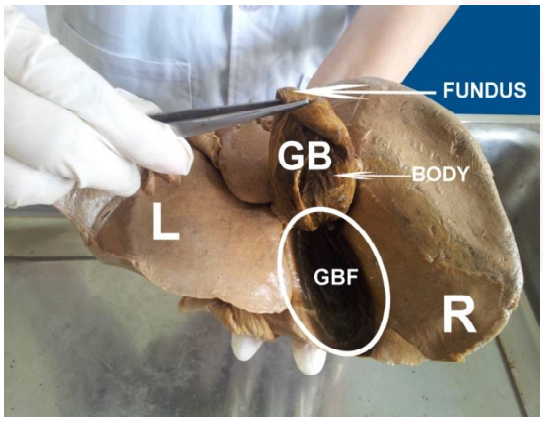
GB-Gallbladder GBF- Gallbladder Fossa
FM-Fold of Mesentery R-Right Lobe
L- Left Lobe Q-Quadrate Lobe

Fig. 4: Floating gallbladder in a harvested Liver from a Male cadaver seen in its deep fossa. The fundus of the gallbladder is seen projecting out from the inferior border.



GB-Gallbladder L-Left Lobe, C-Caudate Lobe,R-Right Lobe

Fig. 5: Floating gallbladder Showing its fundus and body being completely lifted up from the deep gallbladder fossa (shown in the circle).



DISCUSSION

A floating gallbladder is defined as a gallbladder which is completely covered with peritoneum and is usually suspended by a fold of mesentery from its fossa present on the inferior surface of the liver.

In the present study 2 floating gallbladders were seen on the inferior surfaces of the harvested livers. One floating gallbladder, that occurred in a female cadaver had a long fold of mesentery measuring 2.2 cms. in length and 1.5cms in width and was suspending it. This gallbladder was seen out of its shallow fossa and also could be lifted up from the inferior surface in toto. i.e., the fundus,. Body and the neck could all be lifted up from its fossa and also could be moved to the right and left sides. Siva nageswara Rao [2] reported about a floating gallbladder which had a peritoneal fold measuring 3 cms. long and 2.5 cms wide. In the present case study on the gallbladder was suspended by the peritoneal fold was only 2.2cms. in length and 1.5 cms. in width. The other floating gallbladder seen in male cadaver was covered by peritoneum but did not have any fold of mesentery suspending it.

The aetiology of gallbladder torsion is unknown. However, there are several factors that have been postulated as playing significant causative roles. According to Tarhan OR [3], Nicholas JM [4], Atahan K [5] there are two requirements for developing gallbladder torsion, the presence of a long mesentery allowing mobility of the gallbladder along it vertical axis and the other factor is generalized loss of elastic tissue and visceroptosis in the elderly. These factors contribute to non-fixation of the gallbladder to the inferior margin of the liver causing the gallbladder to hang freely in the peritoneal cavity. Thus called as wandering gallbladder.

Ueo T et.al [6]., performed abdominal sonogram in a 35 year old Japanese women and reported the occurrence of acute cholecystitis due to strangulation of the floating gall bladder by the lesser omentum.

Strangulation of wandering / floating gallbladder is one of the reason for acute cholecystitis. According to Chiow AKH [7] the non-fixed gallbladder may undergo complete torsion through 360 degree resulting in strangulation of the blood supply resulting in gangrenous choletcystitis or incomplete torsion through 180 degrees

resulting in symptoms of biliary colic. Stieber AC [8] opined that the direction of torsion may be clockwise or anti-clockwise. Lyons KP [9] opined that at times the incomplete torsion may be associated with spontaneous detorsion. In the present case study the floating gallbladder with a long peritoneal fold was non-fixed and wandering. Hence has higher chances of getting strangulated. In the other case as the peritoneal fold was short and the gallbladder fossa had greater depth the chances of it under going torsion are less.

Kabaroudis A et.al., [10] reported the incidence of a floating gall bladder in a 65 year old female. The liver showed hypoplasia of the right hepatic lobe. In the present study the floating gall bladder occurred in a female cadaver but the liver had both right and left lobes normal. Wen-Cheih Wu [11] opined that a floating gall bladder may cause multiple clinical presentations such as abdominal tenderness near the umbilical region while sitting and in the right upper quadrant region when lying down. According to Morales AM [12] the mortality rates for patients with necrotic gallbladder is 10 times higher. Thus the knowledge of such a rare variation is essential to the medical personnel.

CONCLUSION

In the present study the incidence of floating / wandering gallbladder was 4.44%. This shows the rarity of its occurrence which creates a keen academic interest in the anatomists . The variant anatomy illuminates embryology. Most of the times it is presented as a case report. The present case study is first of its kind reporting its incidence in 45 livers. The knowledge of such variation is helpful to the hepatobiliary surgeons operating on gallbladders and to the radiologists reporting the abdominal scans in cases of wandering abdominal pains.

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Conflicts of Interests: None

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