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Original Research Article

STUDY OF MORPHOLOGICAL VARIATIONS IN HUMAN CADAVERIC LIVERS

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ABSTRACT

Background: Liver is a large gland which occupies a substantial (large) portion of the abdominal cavity of human body .It is situated below the right side of diaphragm and mainly occupies the right hypochondrium, epigastrium and part of left hypochondrium. Anatomically it has left and right lobes which are divided by falciparm ligament, fissure for ligamentamvenousm and fissure for ligamentamteres. It has caudate and quardate lobes as the parts of right anatomical lobe Anatomical variations in cadaveric livers are present in form of lingular process of left lobe, accessory lobe,hypoplastic lobe, accessory fissure and diaphargmatic groove on superior surface of liver.The knowledge of morphological variations of liver may be useful to surgeon during transplantation physicians to rule out the liver diseases and radiologist for correct diagnosis.

Materials and Methods: The knowledge of morphological variations was observed in 50 livers during the routine dissection and specimen present in department of anatomy.In 50 livers we observed 23 were present with morphological variation this shows that 46% of liver were abnormal.

Conclusion: In the present study it is observed that accessory lobe, hypo plastic lobe, accessory fissure and diapharmatic grove on superior surface of liver are more common morphological variations .The morphological variations remains asymptomatic but can lead to misinterpretations during surgical and radiological procedure. Thus the present study is useful for radiologists and surgeons to plan the surgical procedures.

KEY WORDS: Human Liver Variation, Accessory, Hypoplasticlobe.

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INTRODUCTION

Liver is the largest gland and second largest organ in human body which occupies the most of the right and part of left upper abdominal cavity. Anatomically the liver is divided into largest lobe, small left lobe and on right lobe caudate, quadrate lobes are present. Liver size and shape vary with age, size and body weight. In foetus liver weight is 5% of the body weight and it decreases upto 2% in adulthood [1].

In foetal life it is haemopoieticcentre. In first 3 months of gestation right and left lobes are equal in size but left lobe gets smaller when spleen and bone marrow starts functioning.

Morphologically variations of liver are very common but these conditions are rarely noticed as these are asymptomatic. These changes are noticed on surface of the liver [2]. The knowledge of variation like accessory lobe, hypoplastic lobe, accessory fissure are very essential for surgeons for liver transplantation and surgical procedures, radiologists to rule out the liver diseases and physicians for proper diagnosis.

MATERIALS AND METHODS

50 human cadaveric livers are taken for study from dissection hall and museum from MMMCH Kumarhatti, Solan (H.P). The variation in form of lingular process of left lobe,accessory lobe, hypoplastic lobe, accessory fissure and diaphragmatic groove on superior surface of liver are seen and photographs were taken. Morphologically all the livers are free from any pathological lesion. Variations are calculated & tabulated.

OBSERVATIONS AND RESULTS

Fig. 1: Showing accessory lobe (AL), right lobe (RL), left lobe (LL), quadrate lobe (QL), caudate lobe (CL).

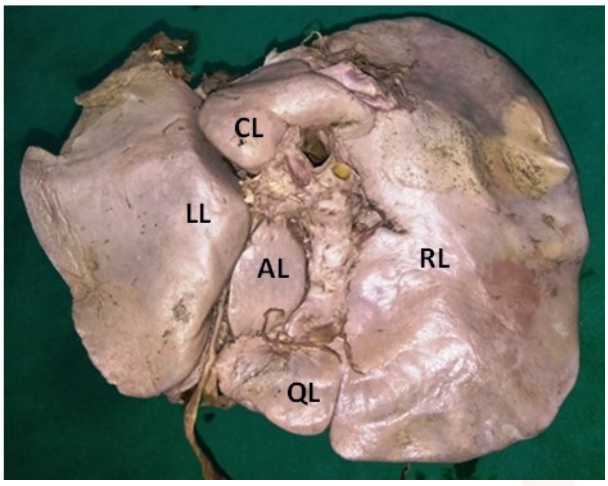

Fig. 2: Showing hypoplastic lobe (HL) left lobe, right lobe (RL) , caudate lobe (CL).

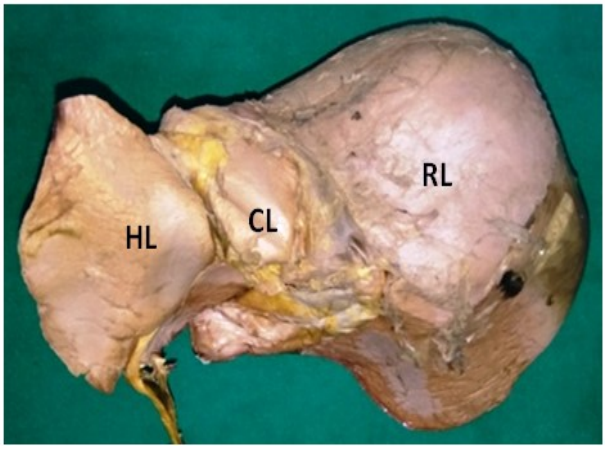

Fig. 3: Showing accessory fissure (AF) on caudate lobe.

Fig. 4: Showing Diaphragmatic Grooves on Superior Surface of the Liver (DG).

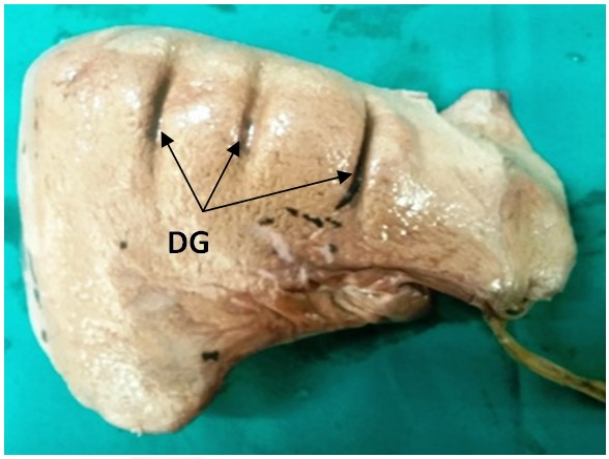

Fig. 5: Showing Lingular Process of Left Lobe (LP).

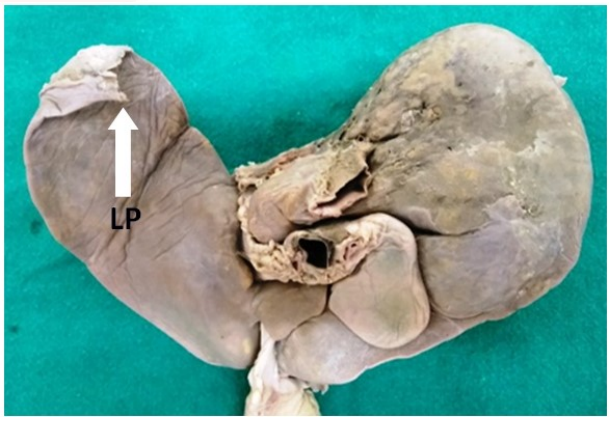

Table 1: Findings of the study.

S.No.	Variations	Number Of Abnormal Cadaveric Livers	Percentage
1	Accessory lobe	6	12%
2	Hypoplastic lobe	7	14%
3	Accessory fissure	5	10%
4	Diaphragmatic grooves on superior surface of the liver	2	4%
5	Lingular process of left lobe	3	6%

In 50 livers we observed 23 were present with morphological variation this shows that 46% of livers were abnormal and 27 livers that shows 52% were normal without any morphologi - calvariation. Out of 23 abnormal livers,6(12%) with accessory lobe (figure 1) .Hypoplastic lobe was seen in 7(14%) livers ,(figure2).Accessory fissure were seen in 5 (10%) livers (figure 3).Diaphragmatic groove superior surface of liver were seen in 2 (4%) livers(figure 4).Lingular process of left lobe were seen in 3 (6%) livers (figure 5).The different findings of morphological variations are described in table.

DISCUSSION

Liver is largest vicera of abdomen which occupies right hypochondrium epigastrium and left hypochondrium .The fissure of this organ are important for locating various lesions and lobar anatomy .The organ is divided into lobes by peritoneal folds .The variation in the fissure like accessory fissure maybe present commonly antero-posterior surface [3]. The accessory fissures are potential source of errors in diagnosis in imaging techniques [4]. The collection of any fluid maybe mistaken for a cyst liver abscess or intraheptic hematoma .Most common morphological variations of liver are irregular in shape ,presence of number of accessory lobes ,accessory fissure ,ligaments . The exact origin of accessory lobe of liver in human is not unknown and it may stimulate tumors [5].

M.F. Royer also noticed the anomalies related to excessive development of liver leads to the formation of accessory lobe of liver which may carry the risk of torsion. The accessory lobe arise most commonly from right lobe and my project in any direction [6].

Sharmila Aristotle observed out of 60 livers studied anomalies were found in 41%, i.e 25 specimens. The variations present were additional lobe in 3 cases (5%) accessory fissure in 8 cases (13.3%), absence of fissure in 1 case (1.6%) and incomplete fissure in 3 cases (5%). In our study we also observed out of 50 livers anomalies were found in 23 livers (46%) which is almost close to Sharmila Aristotle's studies [7].

Abhilasha et.al also studied normal morphological variation of liver lobes .She found out of 50 liver specimen 22 specimen showed morphological variations (44%).In which she observed accessory lobe present in 8 livers (16%), accessory fissure and grooves in ten cases (20%), hypoplastic left lobe in 2 cases (4%). Lingular process of left lobe in 2 cases (4%)(8).Similar pattern of morphological variations is observed in our study.

The congenital abnormalities of human liver are rare (9)and these are rarer than almost any other organ of the body [10]. The embryological basis of the anomalies of liver morphology occurring in course of organogenesis remains to be elucidated [11]. Dodds et.al gave a hypothesis to explain the formation of caudate liver .According to them during second trimester the ductus venosus gives rise to caudate lobe of liver [12]. During the formation of caudate lobe, a small portion of caudate lobe may have become separated from it and included in mesentery of ductusvenosus to form the accessory lobe.

According to Joshi, Athavale in 2009 prominent diaphragmatic grooves on the anterosuperior surface of liver were found in 6% of the cases .Higher incidences of such grooves were observed by Macchi,Feltrin,Parenti et.al in 2003.They suggested that diaphragmatic groove represent a useful land mark for surface projection of portal fissure and hepatic veins and their tributaries [13].

CONCLUSION

The knowledge of variations are very important to anatomist, surgeons for planning surgeries. Patients with the liver morphological changes may present asymptomatic but if such type of anomalies present, proper imaging is recommended for proper diagnosis and management. The present study findings may be helpful for the surgeons and radiologist for proper interpretation of correct diagnosis and surgical procedures.

Conflicts of Interests: **None**

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