

## Case Report

# An anatomic variant caudate lobe in a cadaver

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### ABSTRACT

The liver can present a number of congenital anomalies. Most common among them are the irregularities in shape and the number of lobules. Less common variations include presence of accessory lobes or accessory fissures. The accessory lobe may be attached to the liver through a mesentery or a bridge of hepatic tissue and they are usually asymptomatic. An accessory liver lobe though a very rare occurrence but when it exists it becomes clinically important because of its rarity. We are reporting one such case of accessory caudate lobe of liver found during routine dissection of embalmed cadaver of a 60 year old male. It was separated from the caudate lobe by a well-defined fissure. The quadrate lobe and fissure for ligamentum teres were totally absent. Ligamentum teres was found embedded in the substance of the liver on its inferior surface. The presence of additional lobes and fissures or the absence of normal lobes and fissures might lead to confusion during surgery or clinical misdiagnosis. Knowledge and awareness of these anomalies is useful to the clinician to rule out diseases, surgeons during segmental resection of liver and radiologist when interpreting liver radiologic findings.

**Keywords:** Liver, Gall bladder, Variations, Fissures, Accessory lobes

### INTRODUCTION

Liver is the largest gland of the body. It is situated below the right dome of the diaphragm and mainly occupies the right hypochondriac, right lateral/lumbar and epigastric regions. It is divided into anatomical right and left lobes by the line of attachment of falciform ligament, fissure for ligamentum venosum and fissure for ligamentum teres. Right lobe is larger than the left and caudate and quadrate lobes are its parts. The hilum of the liver or porta hepatis is situated on its inferior surface and it transmits the blood vessels, nerves and lymphatics of the liver. The fossa for gall bladder is situated on the inferior surface of the right lobe of the liver and lodges the gall bladder in it. The fundus of the gall bladder usually projects beyond the inferior border of the liver.<sup>1</sup>

The congenital abnormalities of human liver are rare, and these are rarer than almost any other organ of the body.

Various congenital abnormalities of the liver as agenesis of its lobes, absence of its segments, deformed lobes, decrease in size of lobes, lobar atrophy, hypoplastic lobes, and transposition of the gall bladder and Riedel's lobe have been reported by various authors.<sup>2</sup>

The major anomalies of the liver have been classified as accessory liver lobe, where additional hepatic tissue is attached to the main liver and ectopic liver tissue where normal hepatic tissue is found outside the main liver without any hepatic connection. Occurrence of accessory liver lobe is more common than ectopic tissue.<sup>3</sup>

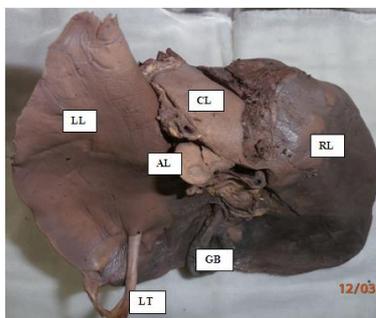
Accessory lobe of the liver is an uncommon anatomical anomaly that is usually asymptomatic and found incidentally at laparotomy or autopsy.<sup>4</sup> Accessory lobe can occur in numerous places. The exact reason for the origin of accessory lobe of liver in man is still unknown.<sup>5</sup> The accessory liver tissue could be formed by the

displacement of the primitive rudiment of the organ, or by persistence of the mesodermal septa during proliferation of the hepatic anlage or by further branching of the foregut diverticulum. They usually present as small tongue like projections from the surface of the liver in the vicinity of the gall bladder fossa or, very rarely, as isolated lobes either connected to the liver by a pedicle or having a separate mesentery containing blood vessels and bile ducts.<sup>6</sup> Accessory lobe may also simulate tumor. In cases where the accessory lobe has a pedicle, torsion is a common event leading to discovery of the abnormal mass.<sup>5</sup>

A sound knowledge of the normal and variant liver anatomy is of immense clinical and surgical importance. It is important to keep in mind the anomalies of liver during the preoperative diagnosis because it will be helpful for the surgeon in planning biliary surgery or a portosystemic anastomosis. The absence of normal fissures and lobes or the presence of additional lobes and fissure might lend significance in the era of diagnostic imaging and minimally invasive surgical approach.

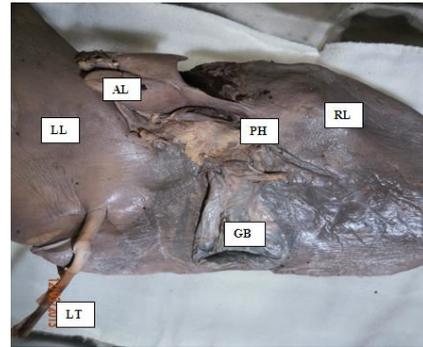
### CASE REPORT

During routine cadaveric dissection classes for undergraduate medical students in the anatomy department of ACMS Delhi Cantt we came across a small accessory caudate lobe of liver in an adult male cadaver which was aged approx. 60 years. It was present to the left of the main caudate lobe close to porta hepatis and was separated from the caudate lobe by a well-defined fissure. The lobe was quadrangular in shape and about 22 mm in length, 29 mm in breadth and 30 mm in width. The fissure for the ligamentum venosum was present to the left of accessory caudate lobe and porta hepatis was below it. The quadrate lobe and fissure for ligamentum teres were totally absent. Ligamentum teres was found embedded in the substance of the liver on its inferior surface. The position and the size of gall bladder were found normal. The falciform ligament was attached at its normal site.



**Figure 1: Photograph of the visceral surface of liver. Note the presence of accessory caudate lobe and absence of quadrate lobe and fissure for ligamentum teres.**

AL: Accessory lobe, CL: Caudate lobe, RL: Right Lobe, LL: Left lobe, GB: Gall bladder, LT: Ligamentum teres



**Figure 2: Photograph of inferior surface of liver shows the ligamentum teres embedded in the substance of liver.**

AL: Accessory lobe, PH: Porta hepatis, RL: Right lobe, LL: Left lobe, GB: Gall bladder, LT: Ligamentum teres

### DISCUSSION

The liver is known to show lobe and fissure anomalies. The presence of additional lobes and fissures or the absence of normal lobes and fissures might lead to confusion during surgery or clinical misdiagnosis. Knowledge and awareness of these anomalies is useful to the clinician to rule out diseases, surgeons during segmental resection of liver and radiologist when interpreting liver radiologic findings.<sup>7</sup>

The embryological basis of the anomalies of liver morphology occurring in the course of organogenesis remains to be elucidated. Dodds et al. gave a hypothesis to explain the formation of caudate lobe of liver. According to them during second trimester the ductus venosus rotates rightward as the liver enlarges, so that a small portion of the liver becomes inserted behind the mesentery for the ductus venosus. This part of liver gives rise to caudate lobe of liver. During the formation of caudate lobe, a small portion of caudate lobe may have become separated from it and included in mesentery of ductus venosus to form the accessory lobe.<sup>8</sup>

The occurrence of accessory liver lobes is one of the rarest variations. Among the reported accessory lobes, Reidel's lobe is the commonly occurring variation. It is a downward growth from the right lobe of the liver towards the iliac fossa and it rarely produces any symptoms.<sup>9</sup> According to Caygill and Gatenby, there are four main types of abnormally positioned livers (1) a liver which is not connected to the main liver and, which is usually, attached to the gallbladder or the intra-abdominal ligaments; (2) a microscopic ectopic liver which is found in the gallbladder wall; (3) a large accessory liver lobe which is attached to the main liver by a stalk, and (4) a small accessory liver lobe (10–30 g in weight) which is attached to the main liver.<sup>10</sup> The accessory lobe which was observed by us belonged to the 4<sup>th</sup> type being a part of caudate lobe and having no stalk or pedicle of its own.

Accessory lobe of the liver is an uncommon anatomical anomaly that is usually asymptomatic and found incidentally at laparotomy or autopsy. Accessory lobes are most commonly found on the undersurface of the liver, but have also been seen on the gall bladder surface, hepato-gastric ligament, near the umbilicus, adrenal gland, pancreas and the thoracic cavity.<sup>4</sup> Accessory intrathoracic liver lobe was first reported by Hansborough and Lipin<sup>11</sup> in 1975. Histologically these lobes show normal hepatic tissue though atypical cirrhosis, centrilobar congestion and chronic inflammatory changes have been described.<sup>10</sup>

## CONCLUSION

Knowledge of variations of liver may be important to anatomists and morphologists for new variant, embryologists for new developmental defect, surgeons for planning surgery involving liver, and imagery specialists for avoiding misinterpretation of CT and MRI.

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