

## A RARE VARIATION OF LIVER WITH THE ABSENCE OF QUADRATE LOBE

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**Abstract:** The liver is a roughly triangular organ that extends across the entire abdominal cavity just inferior to the diaphragm. Most of the liver's mass is located on the right side of the body where it descends inferiorly toward the right kidney. Anatomically, quadrate lobe is situated in the inferior surface of liver. In our cadaveric dissections found with an abnormal findings of liver with the peculiar presence of extra left lobe of liver, absence of ligamentum teres and absence of quadrate lobe.

**Keywords:** Liver, Right lobe, left lobe, Quadrate lobe, Caudate lobe, Ligamentum teres.

**Introduction:** The liver consists of 4 distinct lobes – the left, right, caudate, and quadrate lobes. The left and right lobes are the largest lobes and are separated by the falciform ligament. The right lobe is about 5 to 6 times larger than the tapered left lobe. The small caudate lobe extends from the posterior side of the right lobe and wraps around the inferior vena cava. The small quadrate lobe is inferior to the caudate lobe and extends from the posterior side of the right lobe and wraps around the gallbladder. Liver is Situation in the Right upper Quadrant that is Right Hypochondrium, Epigastrium & Extends into Left Hypochondrium. Colour is Reddish brown in colour & Weights around 1600 gm in males and 1300 gm in females with Wedge shape. Liver consists of 2- Lobes and 5- Surfaces as Anterior, Posterior, Superior, Inferior, Right lateral surfaces. Anteriorly - Two Lobes are seperated by Falciform ligament. Superiorly - Seperated by Ligamentum teres. Inferiorly - Seperated by Ligamentum venosum.

Quadrate lobe is situation in the Inferior surface, Bounded anteriorly by inferior border of liver, Posteriorly formed by porta hepatis, Right side formed by gall bladder, Left side by Ligamentum teres.(obliterated left umbilical vein).

**Materials & Methods:** Human cadavers, Scalpel, Surgical blades, Surgical gloves, Mask, Cotton, Forceps, Scissors & other stationeries.

**Discussion:** The liver is the second largest organ in the human body and the largest gland which weights around 1500 g. It lies below the diaphragm in the right upper abdomen and extends to the left upper abdomen which seperates the thorax and the abdomen too. The liver has wedge shape , with its base to the right and its apex to the left . It is pinkish brown in color and is highly vascular.The liver is divided into two lobes by the middle hepatic vein that is the right lobe of liver and the left lobe of liver also through falciform ligament. The right lobe of liver is larger than the left lobe of liver. The right lobe liver has four sections. It is divided into the anterior right lobe and posterior right lobe by the right hepatic vein. It is also divided into the upper right lobe and lower right lobe by the portal vein. Each of these sections contains branches of the hepatic veins, portal veins, hepatic arteries, and bile ducts. If one of these sections is damaged, the remaining sections of the right lobe of liver continue to work and the patient usually doesn't have any negative effects. If the entire right lobe of liver is damaged or diseased, a liver transplant may be necessary.

NORMAL LIVER



Absence of Quadrate Lobe



According to Couinaud classification of liver anatomy divides the liver into eight functionally independent segments. Each segment has its own vascular inflow, outflow and biliary drainage. In the centre of each segment there is a branch of the portal vein, hepatic artery and bile duct called as portal triad. In the periphery of each segment there is vascular outflow through the hepatic veins. The Right hepatic vein divides the right lobe of liver into anterior and posterior segments. The Middle hepatic vein divides the liver into right and left lobes. This plane runs from the inferior vena cava to the gallbladder fossa. Left hepatic vein divides the left lobe into a medial and lateral part. The Portal vein divides the liver into upper and lower segments. The left portal vein and right portal vein branches superiorly and inferiorly to project into the centre or junction of each segment. Because of this division into individual units, each segment can be surgically resected without damaging remaining segments. For the liver to remain viable, resections must proceed along the vessels that define the peripheries of these segments. This means, that resection-lines parallel the hepatic veins. The centrally located portal veins, bile ducts, and hepatic arteries are preserved.



The liver is divided into a functional left and right by a main porta hepatis containing the middle hepatic vein. This is known as Cantlie's line. Cantlie's line runs from the middle of the gallbladder fossa anteriorly to the inferior vena cava posteriorly. The medial part of the left lobe is separated from the lateral part by the falciform ligament. However it actually is the left hepatic vein, that separates the medial part (segment 4) from the lateral part (segments 2 and 3). The left hepatic vein is located slightly to the left of the falciform ligament. On a normal frontal view the segments 6 and 7 are not visible because they are located more posteriorly. The right border of the liver is formed by segment 5 and 8. The segment 4 is part of the left hemiliver, it is situated more to the right. Due to the absence of Segment -4 or ligamentum teres represents the absence of quadrate lobe. And quadrate lobe boundaries are lost with its visceral relations. Surgically, mismatching the surgical segments of liver occurs due to the absence of these lobes gives an pre-surgical alert. Also we identified the extra lobe of the liver towards the left lobe of the liver which mismatches the surgical lobes of the liver.

**Summary:** In our regular cadaveric dissections we identified a rare condition with the presence of extra left lobe of the liver and the absence of ligamentum teres and absence of quadrate lobe of the liver.

**Conclusion:** Adds the knowledge for anatomists in knowing the extra lobes of liver tissue, Hepatologists in segmenting the liver during hepatectomy of segment-4 during liver carcinoma & tumours, Radiologists in diagnosing and surgeons to prevent the possible misdiagnosis in surgical process during segmental resection. It will be helpful for the surgeon in planning biliary surgery or portosystemic anastomosis.

## References:

1. Rumack CM, Wilson SR, Charboneau JW, Diagnostic Ultrasound, 3rd edition, pages 78 – 81
2. Vu The Huynh, Couinaud Liver Segments in CT Scanner, Vietnamese Radiology Network, February 6, 2011
3. Claude Couinaud, A Passion for the Liver, Arch Surg. 2002;137:1305-1310.
4. Robin Smithuis, Radiology Department of the Rijnland Hospital, Leiderdorp, the Netherlands, Liver: Segmental Anatomy, the radiology assistant, Publication date: 7-5-2006 Liver segmentation: Practical tips
5. Liver segmentation: Practical tips: T. Germain a, □, S. Favelier a, J.-P. Cercueil, Département de radiologie diagnostique et interventionnelle, unité digestif, thoracique et oncologique, CHU Dijon, 14, rue Paul-Gaffarel, BP 77908, 21079 Dijon cedex, France
6. Multiple arteries supplying the human liver: A case report of a rare variation of the blood supplying pattern in a Japanese population Jun Yan, Karen Tokunaga, et-al.
7. Lobe And Segment Anomalies Of the Liver Aktan, Z.A.1 Savas, R.2 Pinar, Y.1 Arslan, O3 1Department of Anatomy, 2Department of Radiology, Ege University, Izmir.
8. Hsu, K. L.; Cheng, Y. F. (1997): Hypoplastic right hepatic lobe with retrohepatic gall bladder complicated by hepatolithiasis and liver abscess: a case report. Hepato-Gastroenterology 44: 803-807.
9. Yamamoto, S; Kojoh, K; (1988): Computed tomograph of congenital absence of the left lobe

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- of the liver. Journal of Computer assisted Tomography 12 : 206.
10. Shailaja S, Lakshmi K, Jayanthi V, Sheshgiri C.A Study of variant external features on cadaveric livers. Anatomica Karnataka.2011; 5(3): 12-16
11. <http://www.radiologyassistant.nl/en/p4375bb8dc241d/anatomy-of-the-liver-segments.html>
12. <http://medicinembbs.blogspot.ru/2011/08/liver-ultrasound.html>
13. Resection of Segments 4, 5 and 8 for a Cystic Liver Tumor Using the Double Liver Hanging Maneuver - Case Rep Gastroenterol. 2008 Jan-Apr; 2(1): 60-66. Published online 2008 Mar 11. doi: 10.1159/000119029 PMID: PMC3075168.

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