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LOBE AND SEGMENT ANOMALIES OF THE LIVER

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ABSTRACT The liver and its duct system develop during the fourth week as an endodermal diverticulum.The growth of liver in the early art of development is profuse affecting both the lobes almost equally.

Many studies have described various congenital anomalies of liver like agenesis or hypoplasia of its lobes, or absence of its segments and their abnormalities.

An unusual anatomical variation of liver was found during dissection of an 58 cadaver, 19 anomalies like absence of the left lobe and quadrate lobe. There was fusion of the left or right lobe with quadrate lobe and transverse fissure in the quadrate lobe. The present study 400 patients abdominal ultrasonography, 25 liver anomalies are reported like absence of the left and right lobe, the posterior segment of the right lobe and the anterior segment of the left lobe.

The variation in the present study is being reported to alert the clinicians and surgeons about the various abnormalities in appearance of liver.

KEYWORDS : Hepatic Lobes, Hepatic Segments.

INTRODUCTION

The liver and its duct system develop during the fourth week as an endodermal diverticulum, from the terminal part of the fore gut at the ventral border of the primitive duodenum. The growth of liver in the early art of development is profuse affecting both the lobes almost equally. The extensive enlargement of liver in the intraute rine life is variously explained. The liver parenchyma abundant oxygened blood, which stimulates its profuse growth. Moreover, the foetal liver is haematopoietic function diminishes sufficiently in the last two months of pregnancy. This is associated with the progressive reduction of its size which mostly affects the left lobe [6].

Congenital abnormalities of human liver are rare. A possibility of the presence of the abnormal liver has to be kept in mind when an unexplained abdominal mass is encountered. There are many kind of describe 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, transposition of the gall bladder and Riedel's lobe[1]. At the left end of the adult left lobe a fibres band (fibrous appendix of the liver) may appear as atrophied remnant of the more extensive part of left lobe found in children [19].

The concept that liver is a segmental organ originated first from the study of Hjortsjo, which was further consolidated by Elias and Petty by plastic casts of ductal and venous system [10,7]. Currently, functional classification of liver is the counaud's division into eight functional segments based on distribution of portal venous branches and locations of veins in parenchyma. Comprehensive knowledge about the differentiation of segments and their abnormalities is essential for successful modern surgeries on hepatobiliary system.

The present study liver abnormalities are reported with ultrasonography finding and ordinary dissection determine the liver anomalies in cadavers.

MATERIAL AND METHOD

An ultrasound of liver uses high frequency sound waves to create a live image from inside of a patient's body. it is painless test that is very commonly used in medical field today, in 1985 Sexon C C and Zeman R K Reported with sonography liver lobe and anomalies, so that liver lobe and anomalies were determined in 400 patient by using ultrasonography.

The patient 200 men and 200 women ranged in age from 32 and 64 year (mean age 49.2 years) There were no hepatic parenchymal abnormality or another hepatic pathology in the cases and ordinary dissection determine the liver anomalies in 58 cadavers.

RESULTS

The ultrasonography finding are shown in table no-1, the liver left lobe agenesis was found in 12 of 400 cases. In six patients, there was no posterior segment of the right lobe. In six patients the anterior segment of the right lobe was absent. The right lobe was totally absent in only one patient. In this case there was associated agenesis of the gall bladder and hepatic veins.

Table – I – The Result in ultrasonography number = 400.

1]	Normal=375 (93.75%)		
2]	Agenesis of left lobe liver	=	12 (3.00%)
3]	Absence of the posterior segment of the right lobe	=	6 (1.50%)
	4]Absence of the anterior segment of the left lobe	=	6 (1.50%)
5]	Absence of the Right lobe	=	1 (0.25%)

The cadaver study liver abnormalities are shown in table no-2 ,the liver absence of left lobe was found in one cadaver. In six cadavers, there was fusion of the left lobe and quadrate lobe. In 8 cadavers fusion of the right lobe and quadrate lobe, in 3 cadavers found transverse fissure in the quadrate lobe and absence of the quadrate lobe in one cadaver.

Table – II - The result of cadavers number = 58

1]	Normal	= 37 (67.05%)
2]	Absence of the left lobe	= 1 (1.72%)
3]	The fusion of the left lobe and quadrate lobe	= 6 (10.52%)
4]	The fusion of the right lobe and quadrate lobe	= 8 (13.76%)
5]	Transverse fissure in the quadrate lobe	= 3 (5.24%)
6]	Absence of the quadrate lobe	= 1 (1.72%)

DISCUSSION

Congenital abnormalities of human liver are rare and correspond to developmental defects during embryogenesis [2]. Developmental anomalies of the right lobe of liver were first reported by Heller in his study in 1870 [11]. Generally, it is associated with anatomical variations like hypertrophy of liver segments and variations in the position of gallbladder. Pages et al. classified these morphological anomalies as agenesis (absence of a lobe or a part of it), aplasia (one of the lobe is small and its structure is abnormal) or hypoplasia (one of the lobe is small but normal in structure [16]. Absence of a hepatic lobe is a rare anomaly of liver development. It is usually noted incidentily at autopsy or surgery [5]. Absent right and left hepatic lobes are generally symptomatic [14]. In our study the right lobe was absent in only one case. The patient was a old age man with normal liver function tests, ultrasonography of the abdomen showed a normal left lobe, caudate lobe and quadrate lobe and liver parenchyma was homogenous in appearance. Agenesis of the right lobe of the liver is a rare finding and was defined as the absence of liver tissue on the right side, with preservation of the middle hepatic vein, without previous disease or surgery. It is usually an incident finding reviled by imaging exam or during abdominal surgery [18]. Agenesis of the right lobe might be associated by with biliary tract disease, portal hypertension and other congenital anomalies [12]. In our series, absence of the right liver lobe, the position of the gall bladder is also at the left side of the liver. The hepatic lobe anomaly is not always congenital. Therefore, the diagnosis of this anomaly requires other things such as no evidence of liver dysfunction.

Congenital agencies of liver affects the left lobe more than the right lobe [5]. But between 1956 and 1931 (31 years) about 24 cases of left lobe hypoplasia were reported. some of these anomalies were associated with additional anomalies like intestinal malrotation, choledochal cyst and partial or complete absence of right side of diaphragm. In case of living the total absence of left lobe of liver is made out only by MRI or CT Scan. The incidence of such anomalies is more commonly seen in male [20]. But present study did not see these anomalies in our cases ultrasonography and cadavers.

In our cases, total absence of the left liver lobe was not determined except one cadaver liver and agenesis 12 cases in ultrasonography. Agenesis of right lobe of the liver occure slightly more often in men, our case was also a man. In patients with agenesis of the right lobe of the liver, the right hepatic vein will be absent [10].

The anterior and posterior segments of the right lobe are separated by the right hepatic vein [17]. Hepatic venous anatomy and thus lobar segmental anatomy can be demonstrated by CT (Pagani, 1983) Sonograhy (Saxon and Zeman 1985) and magnetic resonance imaging (fisher and wall 1985). In our study, the anterior segment absence of the left lone was determined in six patient. Post necrotic cirrhosis malnutrition, biliary obstruction and venous occlusive disease have been associated with atrophy or hypoplasia of a hepatic lobe or segment six patient, but in our lase the remainder of the liver has a normal appearance and the liver function tests were normal. We considered a probable development abnormality in segment anomalies also because of no clinical and biochemical evidence.

Table-3, The incidence of liver anomalies (single or multiple) In cadavers (%)

1. Cadavers	n = 58.
2. Right lobe anomaly	n = 8 (13.79%)
3. Left lobe anomaly	n = 7 (12.06%)
4. Quadrate lobe anomaly	n = 18 (31.03%)

The incidence of the lobe anomalies was seen very high in our study especially in the cadavers (table – 3). It could be very high in society also but the reason why we do not notice them very often may be that these cases are usually asymptomatic. On the other hand it is especially important to keep in mind these liver anomalies in the correct pre-operative diagnosis, because it will be helpful for the surgeon in planning biliary surgery or a Porto systemic anastomosis.

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