An unusual morphology of the *human* liver: a case report with emphasis on its clinical implications

Rao, PPJ.[1], Murlimanju, BV.[2]*, Lobo, SW.[3] and Menezes, RG.[1]

[1]Department of Forensic Medicine and Toxicology, Kasturba Medical College, Manipal University, Mangalore, India
[2]Department of Anatomy, Kasturba Medical College, Manipal University, Mangalore, India
[3]Department of Human Anatomy and Embryology, SABA University School of Medicine, Netherlands Antilles
*E-mail: flutesnowmm@gmail.com

Abstract

During routine autopsy of a male aged 45 years, it was observed that the liver was having some unusual morphology. There were two vertically placed furrows present on the anterior surface of the right lobe. The furrows were partially deep and measured 7 and 4 cm in length. It was reported that the anomalies of the liver are rare in occurrence. The clinician should be aware of developmental anomalies of the liver, as they may cause confusion during the procedures like biopsy, transplantation and lobectomies. In some circumstances the anomalies of liver may be associated with conditions like diaphragmatic hernia, gastric volvulus and portal hypertension. We believe that this case report is important for the clinicians who are involved in the diagnosis and management of hepatic diseases. The knowledge is also enlightening for the morphologists and embryologists.

Keywords: development, furrow, morphology, autopsy, variation.

1 Introduction

The liver is a wedge shaped organ which is considered as the largest gland in the human body. Anatomically it is divided into right, left, caudate and quadrate lobes based on the attachment of its peritoneal ligaments. The congenital abnormalities of human liver are rare (AKTAN, SAVAS, PINAR et al., 2001) and they are rarer than almost any other organ of the body (WAKEFIELD, 1898). The anomalies may be very high in society but we do not notice them very often because these cases are usually asymptomatic (AKTAN, SAVAS, PINAR et al., 2001). They may present in any age group as an accidental finding (DAVER, BAKHSHI, PATIL et al., 2005). It is important to keep in mind about the anomalies of liver during the preoperative diagnosis, because it will be helpful for the surgeon in planning biliary surgery or a portosystemic anastomosis (AKTAN, SAVAS, PINAR et al., 2001). In the present report we discuss a case of rare morphology of the liver, in which there were two furrows observed on the anterior surface of the liver. This kind of variation is not reported in the literature and is rare in its occurence.

2 Case report

During the routine medicolegal autopsy of a 45 years old male, a rare morphology of the liver was observed. There were furrows observed on the anterior surface of the right lobe of the liver. The two vertically placed furrows (Figure 1) were partially deep, measured 7 and 4 cm in length. There were no variations observed on the posterior surface of liver and the structures at the porta hepatis were found normal. The observation of diaphragm did not show any signs of hernia. The left lobe of the liver was showing the usual morphology. The falciform ligament was attached at its normal site. The position and size of the gall bladder were found normal. No other variation was observed in the liver.

3 Discussion

The congenital malformations of the liver include agenesis of the lobes, absence of segments, deformed lobes, decrease in lobe size, atrophy of the lobes and hypoplastic lobes (DAVER, BAKHSHI, PATIL et al., 2005). It was described that among all these malformations, the lobar and segmental anomalies are rare. The embryological basis of the anomalies of liver morphology occurring in the course of organogenesis remains to be elucidated (CHAMPETIER, YVER, LÉTOUBLON et al., 1985). The anomalies of liver can be divided into two categories, anomalies due to defective development and those due to excessive development. These anomalies are sometimes associated with malformations of other organs like diaphragm and suspensory apparatus of the liver (DAVER, BAKHSHI, PATIL et al., 2005). Defective development of the left lobe of liver can lead to conditions like gastric volvulus. In contrast, defective development of the right lobe can remain clinically latent or progress to portal hypertension. The anomalies related to excessive development of the liver lead to the formation of accessory lobes of liver which may carry the risk of torsion (DAVER, BAKHSHI, PATIL et al., 2005). The accessory lobes arise most commonly from the right lobe and may project in any direction. Among them the Riedel's lobe is most common, which descends inferiorly along the right lateral surface as a tongue-like projection. The presence of Riedel's lobe is the best example for excessive development of liver (CHAMPETIER, YVER, LÉTOUBLON et al., 1985).

In the present case the anomaly may be due to the defective development. It was described that the hepatic malformations are common in the perinatal age group since the liver undergoes considerable reformation postnatally (PARKE, SETTLES, BUNGER et al., 1996). According to Parke, Settles, Bunger et al. (1996), all accessory fissures and lobes of the liver should disappear during postnatal

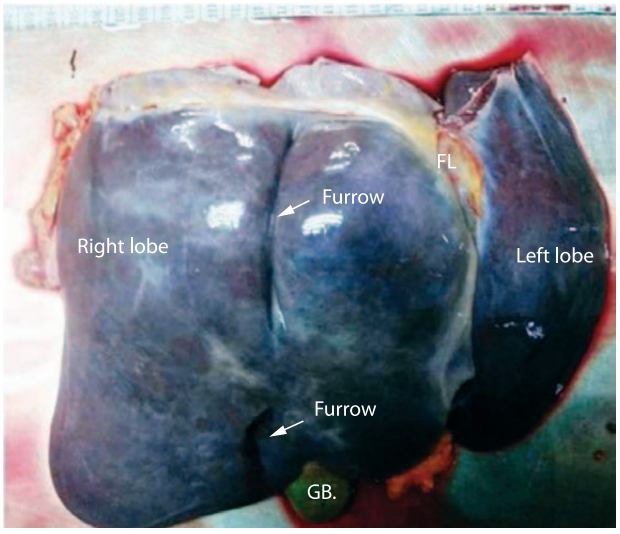

Figure 1. Photograph showing the unusual morphology of the liver. There were two furrows present at the anterior surface of the right lobe of the liver (FL – falciform ligament; GB – gall bladder).

period by the process of liver reformation. In the present case, there may be failure in the postnatal reformation of the liver. The anomalies of liver which were similar to the present case were observed earlier by very few authors. Newell and Morgan-Jones (1993) observed the cadaveric livers bearing anteroposterior grooves or furrows in the superior surface of the right lobe. Gesase (2006) reported a case of bifid liver in which a deep fissure was present extending on the diaphragmatic surface, from the inferior border to the fissure for inferior vena cava dividing the liver in to right and left segments. The segments were united by a very thin liver tissue of 0.7 mm thickness. In the present case similar furrows were observed but they were of lesser depth and were present only on the anterior surface.

Few cases of anomalies of liver are associated with the malformations of other organs. Daver, Bakhshi, Patil et al. (2005) reported a case of bifid liver which was associated with the diaphragmatic hernia. But in the present case, no such anomalies were detected. All the other viscera were found to have normal morphology.

The congenital malformations of liver are of interest, as they throw light on some important problems in the morphological anatomy of the gland (WAKEFIELD, 1898). Though they are of little clinical importance, may present with a diagnostic problem (KAUFMAN and MADOFF, 1960). The knowledge of these variations is essential during procedures like biopsy, lobectomy or transplant surgeries. Whenever there is anomaly of the liver, it is better to examine the other organs as the anomalous liver could be associated with conditions such as gastric volvulus, diaphragmatic hernia and portal hypertension.

We believe that the study of this case is worthy of consideration as the malformations like this, though rare, might lead to serious problems in the clinical diagnosis. The details are also enlightening for the morphologists and embryologists.

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