Anatomical variations in the intrahepatic ramification of portal vein - A retrospective study

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INTRODUCTION

The study was done to evaluate Gross Anatomical ramification pattern of portal vein by using cadaveric liver specimens. Different methods were followed to bring a clear cut ramification of portal vein under the local available circumstances. Study of variations before surgical procedures, segmental resection are important that helps to prevent complication like hemorrhage. Knowledge of Portal vein variation is very important one for the donor because isolation of portal vein branches is not possible during partial hepatectomy. Knowledge of variations in branching pattern of portal vein is also useful for interpretation of radiological study. In the present study pattern of Intrahepatic portal vein were observed in 50 liver specimens by using dissection method and KOH method. The segmental division of the portal vein in the liver proposed by Couinaud, which is universally accepted, has been considered for this study⁶.

MATERIALS & METHODS

The material for the present study comprises of 50 adult human embalmed Liver specimens collected from Anatomy Department MNR Medical college, Sangareddy. Normal dissection method was done in 30 liver specimens. Potassium hydroxide method was used for 20 specimens.

Normal Dissection Method

Specimens without signs of liver disease or trauma were obtained for conducting this study. After separating the liver from the embalmed cadavers it was thoroughly washed in running tap water for 30 min. Later the portal vein was exposed by fine dissection and by using the blunt seeker and pointed forceps the soft tissue or parenchyma of liver was squeezed from the porta hepatis to inwards with blunt seeker. In this method, the vessels were found to be so much intact with their concerned parenchyma that alternative technique was looked for studying the branching pattern.

10% KOH Method

The Livers specimens were kept in 10% KOH for 48 hours and then washed under running water. These liver specimens were subjected to do dissection by squeezing the parenchyma but retaining the portal vein and looked to the terminal ramification level.

OBSERVATION

In our study KOH method was suitable for observing Intrahepatic branching pattern of portal vein. The portal vein ramifies into right and left branches at root of the liver in bifurcation pattern. The right branch bifurcate into right anterior (RA) and right posterior (RP) branches in 35 liver specimens, trifurcate in 10 specimens and seen in fan shape in 5 specimens. The left branch divides into four branches as Superior, Inferior, branch to quadrate lobe and caudate lobes. The Left branch of Portal vein runs to the left lobe of the liver passing through portahepatis, receiving an attachment from the ligamentum venosum and ligamentum teres curving caudally supplying both the medial segment (quadrate lobe ) and the lateral segment of the left lobe of the liver.

Key words: Portal vein (PV), Bifurcation of portal vein (BPV), Trifurcation of portal vein (TPV), Hepatic vein (HV), Potassium hydroxide (KOH)

ABSTRACT

The variations in the branching pattern of portal vein within liver are important while doing hepatectomy. Aim of the study is to evaluate Gross Anatomical ramification pattern of portal vein by using cadaveric liver specimens. This study was done in Anatomy department, M.N.R. Medical college Sangareddy. Method-In this study different methods like dissection and KOH method were used. Observation-During this study variations in branching pattern of Right and Left branches of portal vein were observed. Result-Knowledge of the segmentation of liver based on intra-hepatic ramification of portal vein is of value in the localization of pathological processes and in planning surgical approach.

Figure 1. KOH method for observing intrahepatic portal vein

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Variations in portal vein branching in the liver seems to be very frequent. The portal vein bifurcates into right and left portal veins at porta hepatis. At the next level the Right branch gives rise to two branches (bifurcated) in 80% specimens, it was trifurcated in 15% specimens and fan shaped in 5% specimens. Knowledge of the segmentation of liver based on intra-hepatic ramification of portal vein is of great value in the localization of pathological processes, radiological studies and in planning surgical approach.

**REFERENCES**


**RESULT**

Anatomical variations of intrahepatic ramification of portal vein was done by different workers basing on many methods like corrosion cast, ultrasound, colour doppler etc. Yamane T, Mori K, Sakamoto K, Ikey S, Akagi M. Department of Surgery II, Kumamoto University Medical School, Japan stated that the sub segmental divisions and the ramification patterns of the portal vein in the right and caudate lobes using 25 human liver casts. The ramifications of the portal vein and the subdivisions of the liver were classified based on the major portal veins with the largest diameter and those having a diameter of not less than two thirds of the largest vein in each sub segment. In present study the same pattern of ramifications of intrahepatic portal vein was observed.

Out of several workers ( Hjortsjo 1951 ; Elial & petty, 1952, Healey & Schroy, 1953 ; Goldsmith & wood burne, 1957) who conducted research on the anatomical division of liver, the segmental division of the liver proposed by Couinaud (1957) is the one which is universally accepted. According to Couinaud (1957). The right lobe of liver is divided into anterior and posterior segments and each segment is further divided into four sub segments. In the present study we have observed bifurcation, trifurcation and fan shaped right branch of portal vein.

**DISCUSSION**

Anatomical variations of intrahepatic ramification of portal vein was done by different workers basing on many methods like corrosion cast, ultrasound, colour doppler etc.

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