Study of Variations in the Diameter (Caliber) of Right Hepatic Vein in Male Cadaveric Livers of South Indian Population

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ABSTRACT

The diameter of right hepatic vein is measured from the 25 Male cadaveric livers by Vernier Caliper. A) Diametric Mean Value of right hepatic vein near Inferior Venacava is 1.88 cm ± 0.23 (SD = 0.57), b) Diametric mean value of the right hepatic vein terminating at inferior venacava was 0.98 ±0.3 (SD = 0.82). c) Diametric mean value at the depth of 2cm in inferior venacava is 2.25cm ± 0.8 (SD = 0.19). D) Diametric mean value of tributaries of right hepatic vein is 3.1cm ± 0.43 (SD = 1.77). This diametric (caliber) study will certainly enable the surgeon for planned surgeries and minimize the risk of complication during the resection and transplantation of liver because right hepatic vein present in the right portal scasum in most of the livers. Moreover these diametric study will have clinical and radiological importance as increased diameter was observed in non-alcoholic fatty liver (1) and in portal hypertension in Budd-Chi-ari Syndrome (2).

Keywords: (IVC) Inferior Venacava, Vernier Caliper, Cadaveric liver, Resection of lobes, Transplantation

INTRODUCTION

As liver is the busiest port in the lake of life because it is highest metabolic centre of the body, hence no one can live without “liver”

Hepatic Veins are formed by the union of Central Vein of the lobule. There are three hepatic veins which enter the inferior venacava below the diaphragm. These veins lie between the liver lobules and cross the portal triads. There are therefore no truly vascular planes in the liver. The middle hepatic vein enters inferior venacava separately or more commonly joins left hepatic vein to from short common trunk. Hepatic veins have destitute of valves but a fibrous muscular loop around opening at inferior venacava is present which regulates the constriction and relaxation of the hepatic vein 50. Hepatic veins are so thin that, they are easily compressed by lymph nodes due to increased exudation. This produces a post sinusoidal obstruction with increased sinusoidal pressure. This leads to portal hypertension in ascites 60.

The right hepatic vein drains major part of blood from liver, which receives blood from liver, which receives blood from spleen and Pancreas also 60. The right hepatic vein has more surgical importance because 60% of cases right hepatic vein can be ligated easily from outside the liver but safer to control hepatic vein from within substance of inferior venacava. The important cause of death in hepatic vein injuries apart from hemorrhage is as air embolism which usually occurs at the time of laparotomy. 60 Hence attempt is made to study the diameter of right hepatic vein at various levels so that, ligation can be made properly to avoid injuries to hepatic veins more over diameter of hepatic veins has radiological importance to diagnose pathology of liver.

MATERIAL & METHOD

15 cadaveric livers preserved in formalin in the dissection theatre of JJM Medical College,
Davangere (Karnataka), and 10 from SS Institute of Medical Sciences and Research Centre, Davangere (Karnataka), total 25 Cadaveric livers are dissected and measured with help of Vernier Calipers and observations are noted.

OBSERVATIONS (RESULTS) OR FINDINGS

Table No.1 – Study of diameter of Right Hepatic vein near inferior venacava in adult male cadavers – The mean value is 1.88 cm ± 0.23 (SD = 0.57).

Table 1. Study of diameter of Right Hepatic vein proximal to Inferior Venacava

<table>
<thead>
<tr>
<th>No of Cadaver</th>
<th>Diameter in cm</th>
<th>Mean Value</th>
<th>SD</th>
<th>Confidence Interval value</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>1.88</td>
<td>0.57</td>
<td>1.66 – 2.11</td>
<td></td>
</tr>
</tbody>
</table>

Table No. 2 - Study of diameter of Right Hepatic vein on its termination into inferior venacava – The mean value is 0.98 cm ± 0.3 (SD = 0.82).

Table 2. Study of diameter of Right Hepatic vein on its termination at Inferior Venacava

<table>
<thead>
<tr>
<th>No of Cadaver</th>
<th>Diameter in cm</th>
<th>Mean Value</th>
<th>SD</th>
<th>Confidence Interval value</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>0.98</td>
<td>0.82</td>
<td>0.95 – 1.02</td>
<td></td>
</tr>
</tbody>
</table>

Table No. 3 - Study of dept of Right Hepatic vein at its termination in inferior venacava at 2 cm. – The mean value is 2.25 cm ± 0.8 (SD = 0.19).

Table 3. Study of depth of Right Hepatic vein on its termination at Inferior Venacava

<table>
<thead>
<tr>
<th>No of Cadaver</th>
<th>Diameter in cm</th>
<th>Mean Value</th>
<th>SD</th>
<th>Confidence Interval value</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>2.25</td>
<td>0.19</td>
<td>2.17 – 2.33</td>
<td></td>
</tr>
</tbody>
</table>

Table No. 4 - Study of diameter of tributaries of Right Hepatic vein – The mean value is 3.1 ± 0.43 (SD = 1.07).

Table 4. Study of diameter of the tributaries of Right Hepatic vein.

<table>
<thead>
<tr>
<th>No of Cadaver</th>
<th>Diameter in cm</th>
<th>Mean Value</th>
<th>SD</th>
<th>Confidence Interval value</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>3.1</td>
<td>1.07</td>
<td>2.67 – 3.57</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

In the present study the diameter (caliber) of Right Hepatic vein near the inferior venacava, the mean value is 1.88 cm ± 0.3 (SD = 0.57) (Table - 1). This value is more or less in agreement with German Cadaveric liver study, the mean value of Right Hepatic vein near inferior venacava is 1.5 cm and accessory of tributaries diametric mean value was 0.6 cm (9).

The diametric mean value of Right Hepatic vein at its termination in inferior venacava was 0.98 cm ± 0.3 (SD = 0.5) observed in the present study (Table-2). The same value is also observed in Chinese study their mean value was more than 0.50 cm in 72% of liver (6).

In the present study the diametric value of right Hepatic vein at the depth of 2 cm in Inferior venacava is 2.25 cm ± 0.8 (SD = 0.19) (Table-3). These value were also similar in radiological study of Turkish population, they were ranged between 2-3 cm (9).

In the present study the diametric mean value of tributaries of right Hepatic vein is 3.1cm ± 0.43 (SD = 1.07) (Table-4). These values could not be compared with any previous studies as there was no English literature available. The probable reason could be that people within the same population are diverse due to different genetic makeup (20). Of course veins have larger lumen related to the fact that, to transport the blood in given time to the same volume of the blood as the arterial system and the rate of flow is much slower hence variations of accessory veins are quite common to meet the requirement of hemodynamic pressure, but the relationship between cardiac physiology and liver physiology is bridged by hepatic veins. The knowledge of diametric study of right Hepatic vein is must for potential donors prior to the right lobe transplantation because variations in right Hepatic veins and its tributaries might prevent the operation or make it more complicated (10), because sudden decrease in diameter of right Hepatic vein and Inferior venacava alarm the worst prognosis during the surgery (10).

SUMMARY AND CONCLUSION

The diametric value of Right hepatic vein (a) near inferior venacava, (b) at the termination of Inferior venacava (c) at the 2 cm depth of Inferior venacava, and (d) tributaries of right Hepatic vein. This study will certainly help the surgeons for resection of lobes and transplantation of liver and radiological procedures because during pathological conditions due to enlargement of potential spaces of liver like space of fissae and space of mal, there will be enlargement of these vessels also. It has diagnostic value in oncological and other clinical studies.
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Conflict of Interest: Nil

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