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Size or the Number of Portal Tracts: Which Matters in a Liver Biopsy Core in Chronic Hepatitis C?

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SHORT COMMUNICATION

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ABSTRACT

Liver biopsy has an important role in staging of fibrosis (SoF) and grading of inflammation (GoI) in chronic hepatitis C (CHC) patients. The effect of size and number of portal tracts (NoP) on grading and staging of liver biopsy was evaluated. A total of 150 consecutive liver biopsy core (LBC) of patients with CHC were obtained. There were 98 (65.3%) males. Mean length of LBC was 1.45 ± 0.48 cm. Mean number of portal tracts (NoP) was 11±4.6. Mean length of LBC was greater (1.60±0.45 cm) in stage 4 (n=41; 27.3%) and lesser (1.28±0.39) in stage 1 (n=23; 15%, p=0.04). The mean NoP were 8.5, 10.6 and 13.1 in GoI 1, 2 and 3 respectively (p < 0.001). The mean NoP were 7.6, 11.1, 11.3 and 14.5 in SoF 1, 2, 3 and 4 respectively (p < 0.0001). There was a good correlation between number of portal tracts and length of LBC (r^2=0.56).

Key words: *Liver biopsy. Portal tract. Grade. Stage. Fibrosis. Inflammation. Hepatitis C.*

Liver biopsy is considered the gold standard for the evaluation of infectious and non-infectious diseases of liver. Liver biopsy has an integral role in assessing the stage of fibrosis (SoF) and grade of inflammation (GoI) in patients with chronic hepatitis C (CHC) virus infection; both are important predictors of treatment response and have therapeutic as well as prognostic implications.[1]

Generally grading and staging are performed by using standardized semi-quantitative scoring systems. Ideally, both the grade and the stage should predict prognosis and guide therapeutic intervention, although evidence for this is relatively slight in most chronic liver diseases.[2] Usually, the natural history of CHC infection is slow, with mild inflammatory changes. Chronic hepatitis should be characterized by etiologic designation as well as grade and stage of the disease.[3]

A satisfactory length of liver biopsy has been reported to range from 1 to 4 cm. A sample 1.5 cm long and/or containing 4 to 6 portal tracts has been considered acceptable. There is insufficient literature on the impact of size of LBC in patients with CHC and most of it is reported from Western countries.[2]

The aim of this study was to examine the impact of liver biopsy core size and number of portal tracts on assessing the staging of fibrosis (SoF) and grading of inflammation (GoI) in patients undergoing liver biopsy for chronic hepatitis C (CHC).

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A total of 150 CHC patients with mean age of 39 ± 14 years who underwent liver biopsy were included. Among them, 98 (65.3%) were males.

Overall the mean length of liver biopsy core (LBC) was 1.45 ± 0.45 cm. The mean length of LBC was 1.22 ± 0.37 cm in GoI 1 (n=17; 11.3%), 1.46 ± 0.5 cm in GoI 2 (n=64; 42.6%) and 1. 5 ± 0.45 cm in GoI 3 (n=69; 46%, Table I). There was no statistical significance between length of LBC and grade of inflammation (p= 0.102). Mean length of LBC was 1.28 ± 0.39 cm, 1.47 ± 0.56 cm, 1.34 ± 0.30 cm and 1.60 ± 0.45 cm in fibrosis stages I (n=23; 15.3%), II (n=60; 40%), III (n=24;16%) and IV (n=41; 27.3%) respectively. Mean LBC was significantly longer (1.60 ± 0.45 cm) in stage IV fibrosis than stage I (1.28 ±0.39 cm, p= 0.04).

Table I: Distribution of length of liver biopsy core (LBC) with grades of inflammation and stages of fibrosis.

Grade of inflammation	Mean length of LBC ±SD	Stage of inflammation	Mean length of LBC ±SD
I (n= 17)	1.23 ± 0.37 cm	I (n=23)	1.28 ± 0.39 cm
II (n=64)	1.44 ± 0.53 cm	II (n=60)	1.47 ± 0.56 cm
III (n=69)	1.44 ± 0.49 cm	III (n=26)	1.34 ± 0.30 cm
		IV (n=41)	1.60 ± 0.45 cm

Overall, the mean number of portal tracts in liver biopsy core were 11 ± 4.6. The mean number of portal tracts were 8.5 ± 4.6 in GoI 1 (n=17; 11.3%), 10.6 ± 3.8 in GoI 2 (n=64; 42.6%) and 13.1 ± 4.7 in GoI 3 (n=69; 46%) with high statistical significance (p < 0.001). The mean number of portal tracts were 7.6 ± 2.9 in SoF I (n=23; 15.3%), 11.1 ± 4.1 in SoF II (n=60; 40%), 11.3 ± 4.3 in SoF III (n=24; 16%) and 14.5 ± 4.5 in SoF IV (n=41; 27.3%), again with high statistical significance (p < 0.001).

Significant correlation was between the length of liver biopsy core and the number of portal tracts (r^2 = 0.53, p = 0.001, Figure 1).

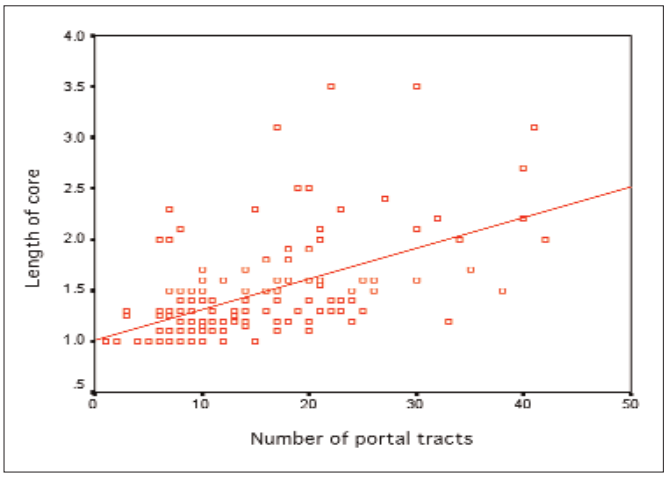

Figure 1: Showing correlation between number of portal tracts and size of liver biopsy core.

The results of this study suggested that the number of portal tracts is more important than the size of liver biopsy core (LBC) in reporting the grade of inflammation and stage of fibrosis in patients with chronic hepatitis C infection. LBC size has importance in accurately establishing the stage of fibrosis but not good-enough in reporting the grading of inflammation. However, there was a linear relationship between the number of portal tracts and the length of liver biopsy core.

These results have demonstrated that grade of inflammation is increasing with the length of LBC but that difference was not statistically significant (p = 0.159). Colloredo *et al.* have shown that reporting milder disease is common with smaller specimen as compared to larger with the statistical significant difference,[4] which is contrary to the present results. This could be a chance finding which can be confirmed in future studies. Nevertheless, these results had shown that the increasing length of the LBC has good relationship with reporting of advanced stage of fibrosis and has statistical significance (p = < 0.014). Similarly Colloredo *et al.* has shown that degree of fibrosis increases with increase in length of specimen as in this study.[4]

Malik *et al.* have reported 26% of advanced fibrosis in their study which is comparable to these results.[5] In this data the mean length of LBC and number of portal tracts were enough to attain the quality of specimen size as reported in international literature.

Recently a Brazilian study also suggested that validity can be obtained with fragment length of 2.5 cm and > 10 portal tracts. However, in this study sample size was relatively smaller as compared to the study by Strauss.[6] It can be assumed that the two studies cannot be compared in terms of demography, alcohol intake and BMI.

It was found that as the number of portal tracts increased, severity of GoI also increased significantly; therefore, reduction in number of portal tracts can result into underestimation of the grade of inflammation in chronic hepatitis C patients. Similarly, the stage of fibrosis is also dependant on the number of portal tracts. The advancement in stage of fibrosis was directly proportional to the number of portal tracts in a liver biopsy core which was statistically significant.

It is concluded that number of portal tracts is better in reliably reporting both the grades of inflammation and stages of fibrosis as compared to the size of liver biopsy core in patients with hepatitis C infection. These two parameters are important in accurately ascertaining disease status and in predicting the treatment outcomes and prognosis. Based on this information the need for reporting number of portal tracts along with the size of liver biopsy core in a histopathology report is emphasized.

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