The adequacy of liver biopsies can be predicted from the length of fresh tissue obtained at the time of biopsy – review of a large case series.

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Background and aim: It is now accepted that an adequate liver biopsy should have at least 10 portal tracts[1]. We asked the question: what length of fresh tissue would guarantee enough microscopic tissue for an adequate liver biopsy after allowing for shrinkage during tissue fixation?
Methods: Data from our reporting systems was analysed for the following: length of macroscopic tissue before tissue processing, microscopic length on the pathology slides, number of portal tracts in each biopsy and diagnosis. We also conducted a prospective pilot study to correlate length of fresh tissue at the time of biopsy with the length of macroscopic tissue when the specimen arrives in the lab in formalin.
Results: Between 2004-2008, there were 412 ultrasound-guided liver biopsies in 195 females (F) and 217 males (M). Portal tracts could not be counted in the following: 98 cases of malignancy **(F=55 M=43 mean 64 yrs)** 42 cases of cirrhosis **(F=23 M=19 mean 55 yrs)** and 14 insufficient biopsies (**F= 7 M=7 mean 55 yrs)**. Of the remaining 258 biopsies, statistical analysis was performed on the 192 (75%) samples where all the variables were available. The diagnoses were: 119 viral hepatitis **(F=45 M=74 mean 37yrs)** 35 fatty liver disease **(F= 14 ,M= 21 mean 49yrs)** 10 haemochromatosis **(F=2 M=8 mean 59yrs)** 7 autoimmune hepatitis (**F=6 M=1 mean 50 yrs)** 6 normal liver **(F=3 M=3 , mean 43 y)** 4 cholestatic liver disease **(F=2 M=2 mean 54yrs)** 4 drug induced liver injury (**F=3 M=1 mean 39yrs)** 7 others **(F=5 M=2 mean 51yrs)**. After removing outliers in the data, and using linear regression analysis, the length of the macroscopic tissue accounted for 95.1% of the variance in the microscopic tissue and 85.2% of the variance in the number of portal tracts.
Chi-square analysis showed that age ((^{2} = 2.511, p>0.05) and sex ((^{2} = 0.535 p>0.05) were non-significant parameters in the acquisition of sufficient portal tracts. We calculated that 29 mm of macroscopic tissue equating to 26 mm of microscopic tissue (p<0.01) would guarantee an adequate liver biopsy with at least 10 portal tracts in any diagnosis excluding cirrhosis and malignancy. Our pilot study of 10 consecutive biopsies showed no tissue shrinkage during transport in formalin to the lab. In this current larger sample, the tissue did show shrinkage (from a mean length of 23.82 mm to 21.01 mm), but this change is consistent (r=0.829 p<0.01).
Conclusion: Using an 18 Fr needle we suggest that operators ensure that they obtain at least 18 mm of fresh liver tissue from to ensure that patients have an accurate diagnosis and avoid a repeat biopsy. To our knowledge this is the first study showing these findings.

References

Taylor DM et al. Gastroenterology 2008; 134 (S1): A-834