The usefulness of magnetic resonance elastography in predicting progression of cirrhosis from Child-Pugh class A to B

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Target audience: Radiologists and scientists who are interested in chronic liver disease and magnetic resonance elastography.

Purpose: The study aimed to evaluate the usefulness of magnetic resonance elastography in predicting the progression of cirrhosis from Child-Pugh class A to B in patients with hepatitis C.

Methods: We reviewed the data of consecutive 128 patients with type C viral hepatitis who underwent magnetic resonance elastography and had available laboratory tests, Child-Pugh class A disease, and no clinical history of hepatocellular carcinoma. We longitudinally analyzed the incidence of cirrhosis progression as defined by the progression from Child-Pugh class A to B at two subsequent follow-up points. Various clinical factors and liver stiffness values were evaluated for the ability to predict the progression of cirrhosis.

Results: Disease progression was noted in 22 patients (17%) during the mean (standard deviation) follow-up period of 16.6 (6.2) months. Liver stiffness, older age, Child-Pugh score of 6, lower prothrombin activity, and non-treatment response to anti-viral therapy were independent risk factors of disease progression. (Table. 1) The 1-year cumulative rate of cirrhosis progression in patients with liver stiffness values of <3.3 kPa, 3.3–8.1 kPa, and ≥8.1 kPa were 1.31%, 15.8%, 92.3%, respectively (P < 0.001). (Fig. 1) In a subanalysis of patients with a Child-Pugh score of 6 who did not respond to anti-viral treatment, only a liver stiffness value of >3.3 kPa was a risk factor of cirrhosis progression (hazard ratio: 6.60; 95% confidence interval: 1.13–119.6). (Fig. 2)

Discussion: It is evident that the Child-Pugh class is more likely to progress from A to B in patients with cirrhosis than those with pre-cirrhosis. In our study, we elucidated that the liver stiffness measurement obtained using MRE is an indicator of the early progression of Child-Pugh class, as well as other factors shown in previous studies[1)2)3)].

Conclusion: The risk of cirrhosis progression from Child-Pugh class A to class B is significantly increased if liver stiffness as measured by magnetic resonance elastography is elevated.

References; 1) Dienstag JL, et al. Hepatology 2011; 54: 396-405, 2) Lieber CS, et al. Am J Gastroenterol 2006; 101: 1500-1508, 3) Wai CT, et al. Hepatology 2003; 38: 518-526

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	Hazard Ratio	95% CI	*P* Value
Liver stiffness	5.466	1.640–22.71	0.0015*
Age	1.072	1.005–1.152	0.0328*
Child-Pugh score	1.699	0.6547–0.4947	0.0049*
AST	1.004	0.9780–1.0246	0.7676
Prothrombin activity	0.9354	0.8800–0.9871	0.0140*
Platelet count	1.003	0.9945–1.011	0.4325
Serum albumin	0.4895	0.08017–2.701	0.4169
Alpha-fetoprotein	1.003	0.9964–1.007	0.2831
Treatment (responder/others)	<0.001	0.000–0.8391	0.0344*

Table 1. *A Cox proportional-hazard model revealed that higher liver stiffness, older age, Child-Pugh score of 6, lower prothrombin activity, and non-treatment response were independent risk factors of cirrhosis progression.*

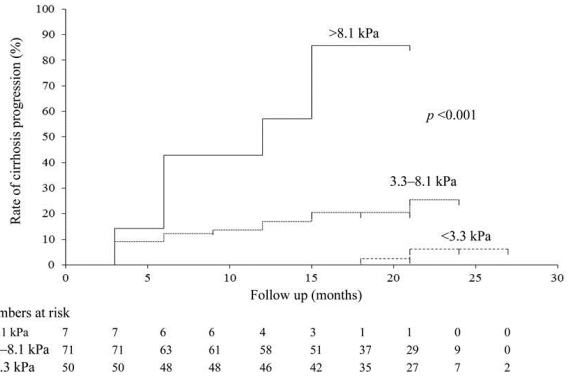
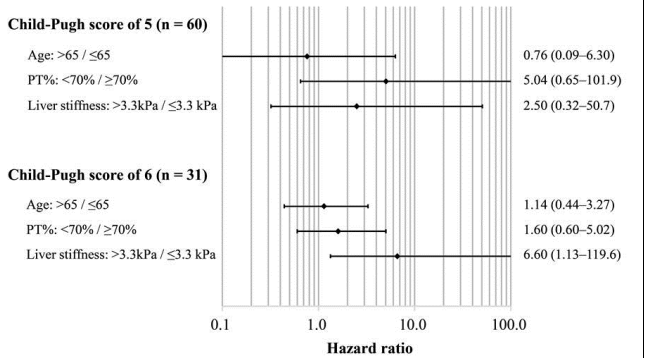


Fig 1. *The 1-year cumulative rate of cirrhosis progression in patients with liver stiffness values of <3.3 kPa, 3.3–8.1 kPa, and ≥8.1 kPa were 1.31%, 15.8%, and 92.3%, respectively (P < 0.001).*



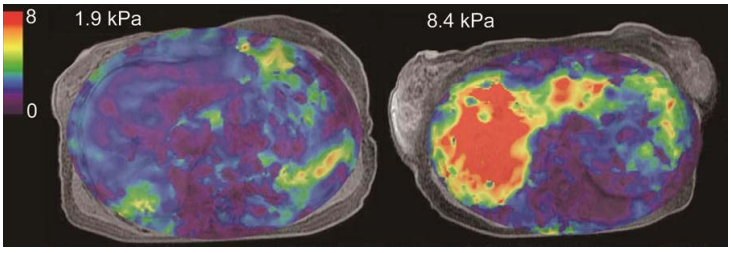


Fig 2. *Among the potential risk factors examined, only a liver stiffness of >3.3 kPa was a significant risk of cirrhosis progression in patients with a Child-Pugh score of 6 (hazard ratio: 6.60; 95% CI: 1.13–119.6)*