

## Diffusion weighted magnetic resonance imaging of liver: Principles, clinical applications and recent updates

Anuradha Shenoy-Bhangle, Vinit Baliyan, Hamed Kordbacheh, Alexander R Guimaraes, Avinash Kambadakone

Anuradha Shenoy-Bhangle, Beth Israel Deaconess Medical Center, Boston, MA 02215, United States

Vinit Baliyan, Hamed Kordbacheh, Avinash Kambadakone, Harvard Medical School, Abdominal Imaging and Interventional Radiology, Massachusetts General Hospital, Boston, MA 02114, United States

Alexander R Guimaraes, Oregon Health and Science University, Portland, OR 97239, United States

**Author contributions:** All authors contributed equally for concept, literature search and manuscript writing.

**Conflict-of-interest statement:** Nothing to disclose.

**Open-Access:** This article is an open-access article which was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

**Manuscript source:** Invited manuscript

**Correspondence to:** Avinash Kambadakone, MD, FRCR, Assistant Professor, Harvard Medical School, Abdominal Imaging and Interventional Radiology, Massachusetts General Hospital, White 270, 55 Fruit Street, Boston, MA 02114, United States. [akambadakone@mgh.harvard.edu](mailto:akambadakone@mgh.harvard.edu)  
Telephone: +1-617-6432009  
Fax: +1-617-7264891

Received: December 30, 2016  
Peer-review started: January 3, 2017  
First decision: February 4, 2017  
Revised: April 6, 2017  
Accepted: June 6, 2017  
Article in press: June 7, 2017  
Published online: September 18, 2017

### Abstract

Diffusion-weighted imaging (DWI), a functional imaging technique exploiting the Brownian motion of water molecules, is increasingly shown to have value in various oncological and non-oncological applications. Factors such as the ease of acquisition and ability to obtain functional information in the absence of intravenous contrast, especially in patients with abnormal renal function, have contributed to the growing interest in exploring clinical applications of DWI. In the liver, DWI demonstrates a gamut of clinical applications ranging from detecting focal liver lesions to monitoring response in patients undergoing serial follow-up after loco-regional and systemic therapies. DWI is also being applied in the evaluation of diffuse liver diseases such as non-alcoholic fatty liver disease, hepatic fibrosis and cirrhosis. In this review, we intend to review the basic principles, technique, current clinical applications and future trends of DW-MRI in the liver.

**Key words:** Liver imaging; Diffusion weighted imaging; Magnetic resonance imaging; Focal liver lesion; Diffuse liver disease; Response assessment

© The Author(s) 2017. Published by Baishideng Publishing Group Inc. All rights reserved.

**Core tip:** This article reviews the current role of diffusion weighted imaging for various oncological and non-oncological applications in the liver.

Shenoy-Bhangle A, Baliyan V, Kordbacheh H, Guimaraes AR, Kambadakone A. Diffusion weighted magnetic resonance imaging of liver: Principles, clinical applications and recent updates. *World J Hepatol* 2017; 9(26): 1081-1091 Available from: URL: <http://www.wjgnet.com/1948-5182/full/v9/i26/1081.htm> DOI: <http://dx.doi.org/10.4254/wjh.v9.i26.1081>