Recommendations on the Use of Magnetic Resonance Imaging for Collaborative Multicenter Studies in Primary Sclerosing Cholangitis

TO THE EDITOR:

Recently, the magnetic resonance (MR) imaging (MRI) working group of the International PSC Study Group (IPSCSG) has published a position statement on the use of MRI regarding diagnosis and follow-up of primary sclerosing cholangitis (PSC) patients.[1] These guidelines are intended for use by physicians in daily clinical routine. In addition, the group has outlined several areas of research, which need to be addressed in the near future. Given that PSC is a rare disease with the clinical outcome being determined by the development of end-stage liver disease and hepatobiliary malignancy,[2,3] large, prospective, multicenter studies are needed to establish the potential of MRI for early PSC diagnosis, detection of disease-related complications, and in order to address the prognostic value of MRI. Furthermore, there is a lack of data regarding correlation of MRI findings and histology, as well as the correlation of MRI and endoscopic retrograde cholangiography (ERC) findings in the early disease state. In this sense, the IPSCSG strongly encourages worldwide scientific collaborations. However, distinct heterogeneity of MRI quality and protocols among institutions currently hampers comparison of studies and collaborations. Therefore, the MRI working group of the IPSCSG felt the need to define an extended MRI protocol for use in multicenter studies, facilitating research collaboration using a standardized approach (Table 1). The recommendations in this addendum are based on the recently published position statement of the working group, including additional aspects specifically intended for scientific use. The herein presented protocol was discussed and consented at the last group's workshop in 2017 in Hannover, Germany, and circulated within the

TABLE 1. PSC MRI Protocol for Collaborative Multicenter Studies

Field strength: preferably 1.5T	
Patient preparation: fasting 4 hours before scan; no general recommendation for spasmolytics; oral use of diluted gadolinium or pineapple juice for suppression of stomach and duodenal fluid content is optional	
Intravenous contrast: yes, preferably Gd-EOB-DTPA; alternatively, Gd-BOPTA or an extracellular contrast agent may be used; weight-based dosing of contrast agent	
Scan protocol: complete workup including the use of an intravenous contrast agent, as outlined in the initial position paper,[1] plus additional sequences (see below)	
Sequence	Comment
Precontrast imaging:	
1. T2w coronal 3D MRCP	2D MRCP and single-shot MRCP may be acquired additionally
2. T1w axial	
3. T1w Dixon imaging axial	alternatively, in-/opposed phase imaging may be considered
Postcontrast imaging:	
4. T1w contrast dynamic	use of fat suppression; precontrast, arterial, portal venous, and equilibrium phase (transitional phase)
5. T2w axial	preferably use of fat suppression; TSE or HASTE may be considered alternatively
6. T2w coronal	preferably use of fat suppression; TSE or HASTE may be considered alternatively
7. DWI	preferably three b-values: 50 or 100, 400-600, and ≥700 s/mm^2, additional b-values are optional
8. MRE[4]	optional
9. T1w HBP axial	use of fat suppression; 15-20 minutes after contrast injection; coronal plane may be acquired additionally
Optionally in postbiopsy patients: MRI should be ideally performed 4-6 hours after biopsy and the biopsy site marked (e.g., with vitamin E capsule). Axial T2*w sequence, 3-mm slice thickness with breath-holding	

Abbreviations: T, Tesla; MRCP, magnetic resonance cholangiopancreatography; TSE, turbo spin echo; HASTE, half Fourier acquisition single-shot turbo spin echo; DWI, diffusion-weighted imaging; MRE, MR elastography; HBP, hepatobiliary phase.

IPSCSG. Widespread use of this protocol should facilitate scientific collaboration and enhance PSC research.

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Potential conflict of interest: Dr. Halibasic advises for and is on the speakers' bureau for Intercept. She is on the speakers' bureau for and received grants from Falk. She advises for Novartis.

Appendix

Members of the MRI working group of the IPSCSG who were involved in creating this protocol: Domenico Alvaro (Rome, Italy), Lionel Arrivé (Paris, France), Ahmed Ba-Ssalamah (Vienna, Austria), Annika Bergquist (Stockholm, Sweden), Helen Bungay (Oxford, UK), Vincenzo Cardinale (Rome, Italy), Nora Cazzagon (Paris, France), Vanja Chengija (Oslo, Norway), John Eaton (Rochester, MN), Martti Färkkilä (Helsinki, Finland), Annarosa Floreani (Padua, Italy), Gunter Kemmerich (Oslo, Norway), Guido Kukuk (Bonn, Germany), Beatrice Madrazo (Miami, FL), Sarah Pötter-Lang (Vienna, Austria), Anna Stadnik (Warsaw, Poland), Andrea Tenca (Helsinki, Finland), Michael Trauner (Vienna, Austria), Sudhakar K. Venkatesh (Rochester, MN), Tobias Weismüller (Bonn, Germany), Jin Yamamura (Hamburg, Germany), and Roman Zenouzi (Hamburg, Germany).

Pre-Emptive Transjugular Intrahepatic Portosystemic Shunt for Acute Variceal Bleed: Choose Your Patient Well!

TO THE EDITOR:

I read with great interest the manuscript published by Hernández-Gea et al.[1] The authors have eloquently demonstrated the survival benefit of pre-emptive transjugular intrahepatic portosystemic shunt (p-TIPS) placement in patients with Child C cirrhosis presenting with acute variceal bleed (AVB). I would like to emphasize on a critical aspect of this study: