LIVER ECHOTEXTURE - A METHOD TO IMPROVE INTERPRETATION

ACR ANNUAL MEETING 2018
BRAHEE D, KLEPCHICK P, THOMPSON D

THE AUTHORS HAVE NO DISCLOSURES
LIVER ECHOTEXTURE

- INTRODUCTION

- Ultrasound (US) is a commonly used diagnostic tool in the evaluation of the liver and is the most highly recommended imaging modality used in evaluation of suspected liver disease [1].

- However, as it is largely subjective, characterizing liver echotexture is often difficult for radiologists with limited experience [2].

- There have been few studies in the literature demonstrating techniques for evaluating liver parenchyma echotexture characteristics and a consistent measurement method has not been established [3,4,5,6].
LIVER ECHOTEXTURE

- OBJECTIVE

  To determine if specific training in interpretation of liver US utilizing comparison to the spleen and a practice tutorial will improve interpretation agreement and diagnostic confidence in new radiology residents.
LIVER ECHOTEXTURE

- METHODS

- A retrospective review was performed of 64 abdominal US examinations in adults (with representative cases of both normal and abnormal liver echotexture) imaged between 07/01/2014 and 07/01/2015.
LIVER ECHOTEXTURE

METHODS

Eighteen physicians (Reviewers) were grouped by level of Radiology training: Novices (1st year Residents), Intermediate (3rd – 4th year Residents), and Expert (Attending Radiologists who routinely interpret US).
LIVER ECHOTEXTURE

METHODS

Each Reviewer was asked to review 64 randomized abdominal US images to rate the echotexture characteristics of the liver as homogeneous or heterogeneous and record their diagnostic confidence level using a 5-point Likert scale.
LIVER ECHOTEXTURE

- METHODS

  Six weeks later, Reviewers participated in a liver echotexture tutorial which demonstrated use of the spleen as an internal reference, and after approximately 4 additional weeks, the same 64 scans were newly re-randomized and re-reviewed.
RESULTS

A total of 2304 abdominal US case reviews were performed. A consensus of the Experts in this study, with an intra-rater reliability ICC>0.8, formed the basis for an accuracy standard.
RESULTS

Using a quadratically weighted kappa, there was significantly greater agreement between the Novice group and Expert consensus after the tutorial (p = .004) than before.
LIVER ECHOTEXTURE

RESULTS

- Using a weighted kappa to measure agreement; all of the 9 Novice Reviewers were in “fair” to “poor” agreement (kappa <.40) with Expert Consensus before the liver echotexture tutorial.

- After the tutorial, 5 of the 9 in the Novice group improved to “moderate” agreement (kappa >.40) with Expert Consensus.
RESULTS

By intraclass correlation coefficient (ICC) analysis, before the tutorial, none of the Novice Reviewers had “good” agreement with a consensus of Expert Reviewers (ICC for all Novices < .60).

After the tutorial, 3 of the 9 in the Novice group were in “good” agreement (ICC ≥ .60) with Expert Consensus.
CONCLUSION

When characterizing liver echotexture on US, the use of the spleen as an internal comparison improves interpretation consensus and confidence in Novice and Intermediate level radiology residents as demonstrated in this preliminary study.

Also, a tutorial to demonstrate how to apply this principle is useful.

This technique should be considered as a training tool for inexperienced US readers.
IN SUMMARY

When evaluating the echotexture of the liver parenchyma, comparing to that of the spleen improves resident interpretation and confidence as well as leads to more consistent agreement with attending (Expert) interpretations.
REFERENCES


