Contrast-enhanced endoscopic ultrasound: Why do we need it? A foreword

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Ultrasound contrast agents (UCAs) have become quintessential for differentiating liver and other abdominal lesions, alongside transabdominal B-mode imaging.[1,2]

In recent years, the use of UCAs has become widespread also in endoscopic ultrasound (EUS) to enhance its diagnostic accuracy in pancreaticobiliary diseases.[3-5]

Preliminary experience with the first-generation UCAs, dating back more than 15 years ago, used color and/or power Doppler imaging to perform contrast-enhanced EUS (CE-EUS). Subsequently, the second-generation UCAs were developed with dedicated contrast harmonic algorithms and quickly became established thanks to their safety and favorable learning curve.

This special issue of EUS reports on the use of UCAs to investigate pancreatic lesions, gallbladder abnormalities, submucosal tumors, lymph nodes, and other pathological conditions.

Different acronyms have been used over the years to refer to techniques incorporating UCAs. To improve comprehension of the articles in this special issue, it is worthwhile clarifying the meaning of all these terms.

Contrast-enhanced ultrasound (CEUS) was introduced as an acronym by members of the European Federation of Societies for Ultrasound in Medicine and Biology (EFSUMB) and finally accepted as the official term describing CEUS techniques in general.[1,2,6,7]

Similarly, the acronym CE-EUS is used as a generic term for all contrast-enhanced techniques used with EUS, independent of particular physical principles.

Contrast enhancement techniques during EUS examinations are possible using low or high mechanical index (MI). Therefore, the acronyms for contrast-enhanced low MI-EUS (CELMI-EUS, first applied in 2003 and published in 2005 and 2009)[8,9] and contrast-enhanced high MI-EUS (CEHMI-EUS, first published in 1997 and 2001) ensued.[10-13]

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Analogous to the original percutaneous approaches, CELMI-EUS describes low MI techniques, including filter/wide-band harmonic (phase or pulse) or cancellation techniques. Consequently, the terms contrast-enhanced harmonic-EUS (CEH-EUS) and contrast harmonic EUS (CH-EUS) have been used to describe low MI techniques.[14-20]

Contrast-enhanced endoscopic Doppler techniques (color Doppler, power Doppler, others) use high MI and, therefore, are included under the acronyms CEHMI-EUS or CED-EUS (contrast-enhanced Doppler-EUS). However, higher MI techniques are also used for (intermittent) harmonic imaging.

Dynamic CEUS has been adopted as the term describing time-intensity curve analysis.[5,21] Furthermore, CEUS three-dimensional (3D) techniques were introduced as early as 2002,[22] followed by CE-EUS 3D.[23,24] All the acronyms described to date are independent of the additional terminology used by manufacturers.

The current manufacturer's terms for low MI examination modes are as follows:

- Wideband Pulse Inversion Contrast Harmonic Imaging (Hitachi-Pentax)
- Contrast Harmonic-enhanced Imaging based on Extended Pure Harmonic Detection (Olympus-Aloka)
- Contrast-harmonic Imaging-EUS (Fujinon).

Nevertheless, CEH-EUS and CH-EUS are the most widely utilized acronyms by the majority of authors. Further efforts to standardize terminology and acronyms are underway by several authorities under the auspices of the EFSUMB.

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