

## Ultrasonography in abdominal emergencies: quick and easy and safe decision making

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Dear Editor,

Is it possible to simply look at the gallbladder (and other abdominal organs) and decide within a few minutes or even seconds, whether the biliary system is healthy or not? Can one so quickly plan the need for specific treatment as such as antibiotics, endoscopic intervention, or surgery? Is it possible to accomplish this with a minimum of expense, equipment, effort and with a reasonable investment in learning and training? This is a dream that has come to life—it has come to life through abdominal ultrasonography, performed by the surgeon or the gastroenterologist him or herself. In addition, this dream holds true in both emergencies and in routine work up of any abdominal problem.

It may be difficult for younger colleagues to believe, but it is only 30 years ago that the surgeon was the only person afforded insight into the abdomen. It was the surgeon who discovered and told other colleagues what was the real diagnosis in a patient with especially acute (or more chronic) abdominal problems. In the last 30 years, things have changed considerably due to the combination of two factors: first sectional imaging—especially abdominal ultrasonography (US); and second due to gastrointestinal endoscopy. Today, the surgeon is provided with optimum of pre-operative information regarding the patient's pathology. In many European countries, not only the endoscopy but also the ultrasound examination are

performed by the responsible clinician him or herself. This is the most efficient approach for immediate, precise and highly informative insight into the abdomen.

So what does clinical ultrasonography mean today? After the patient's history taken, ultrasonography is an integral part of the physical examination and evaluation. Ultrasound allows the clinician to render real-time sectional images from all abdominal organs. These multiple individual slices or images allow the clinician to create an actuarial three-dimensional mental picture of the individual's anatomy, function, and pathology. Quite simply, one can look into the abdomen and read it like an open book. In fact, this is not at all difficult, especially with modern ultrasound machines of the middle or high end class, be they cart systems or mobile/portable machines.

This US-equipment provides detailed real-time pictures from all parenchymatous organs (liver, pancreas, spleen, and lymph nodes) and from all fluid containing organs and tubular structures such as the gallbladder, urinary bladder, abdominal, and parenchymal vessels of all types and the gut, irrespective of their fluid content. Moreover, the conventional B-scan and the colour-coded information allow the analysis of flow phenomena as well as active versus passive movement of fluid.

Ultrasound gives an insight into the living organs in normal and pathological conditions in a way that is unequalled by any other imaging modality. This is due to the extremely high local resolution capability of US and the real-time imaging of living perfused organs. This capability exceeds the impact of the normal and pathological gross anatomy even with the use of a magnifying glass.

In abdominal emergencies of any type including trauma, ultrasonography provides the clinician performing the examination considerable information beyond the basic physical examination. This includes:

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- pathologic fluid collections in the abdominal cavity, to be defined in more detail by ultrasound-guided fine needle puncture,
- acute inflammatory conditions, e.g., in acute cholecystitis or in acute pancreatitis,
- pathological gas collections in the abdominal cavity, and
- the given anatomy of an individual patient with its normal features that allow the clinician to rule out many differential diagnostic considerations in the sense of exclusion. In addition, the ability to discover pathological conditions such as focal lesions or blunt trauma in parenchymatous organs, perfusion disorders in vascular problems such as arterial or venous

occlusion, aneurysm, etc., outflow obstacles such as in acute biliary or urinary obstruction, or transport problems in intestinal obstruction (ileus, subileus).

Why should the gastroenterologist and the abdominal surgeon perform ultrasonography on their own in their acute and routine patients? Simply because it will give him (or her) immediate access to a rich source of information concerning any abdominal structure, that one should not care for their patient without it. Learn and perform abdominal ultrasound on your own—it is an easy and beautiful clinical modality to serve your patients.

**Conflict of interest statement** There are no conflicts of interest.