

ACUTE COLONIC DIVERTICULITIS. IS TRANSABDOMINAL ULTRASOUND COMPARABLE TO COMPUTED TOMOGRAPHY IN DIAGNOSIS?

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INTRODUCTION

Acute colonic diverticulitis (CD) occurs when mucosal protrusions (diverticula) from the colon wall becomes infected and inflamed. Its incidence increases with age and occurs most commonly in the sigmoid and left colon but can also be found in the right colon⁷.

Although uncomplicated cases resolve with conservative management, severe complications such as perforation, peritonitis or large abscesses can require urgent interventional or surgical management³. The causes of diverticulitis is thought to be linked to age, diet, lifestyle and genetics.

The SCoR/BMUS guidelines (2019) lists diverticulitis among the bowel conditions where ultrasound (US) can and should contribute in diagnosis and disease surveillance (see table 1 and figure 1-3) however in the author's institution, patient's with suspected diverticulitis are referred directly for only a computerised tomography (CT) scan. The National Institute for Health and Care Excellence (NICE) guidance for the diagnosis and management of diverticular disease is currently under development. **The aim of this review is to determine if the value of transabdominal US is comparable with abdominal CT in diagnosing acute CD. Which modality is the most appropriate diagnostic imaging tool to confirm suspected cases of acute CD?**

Table 1
SONOGRAPHIC FEATURES OF DIVERTICULITIS^{1,7}

A - Bowel wall thickening

- 1- Segmental concentric wall thickening(>4mm).
- 2 - Hyperaemia on doppler.

B - Inflamed diverticula

- 1 - Bright "ears" protruding from the bowel wall with an ill-defined margin.
- 2 - Inspissated faeces maybe seen as a central shadowing echogenicity.

C - Peri-enteric soft tissue

- 1 - Inflammation of pericolonic fat(Hyperechoic mass effect).
- 2 - Abscess formation(maybe intramural or pericolonic).
- 3 - Fistulas- linear tracts from gut to bladder, vagina or adjacent loops (Hypoechoic or Hyperechoic).

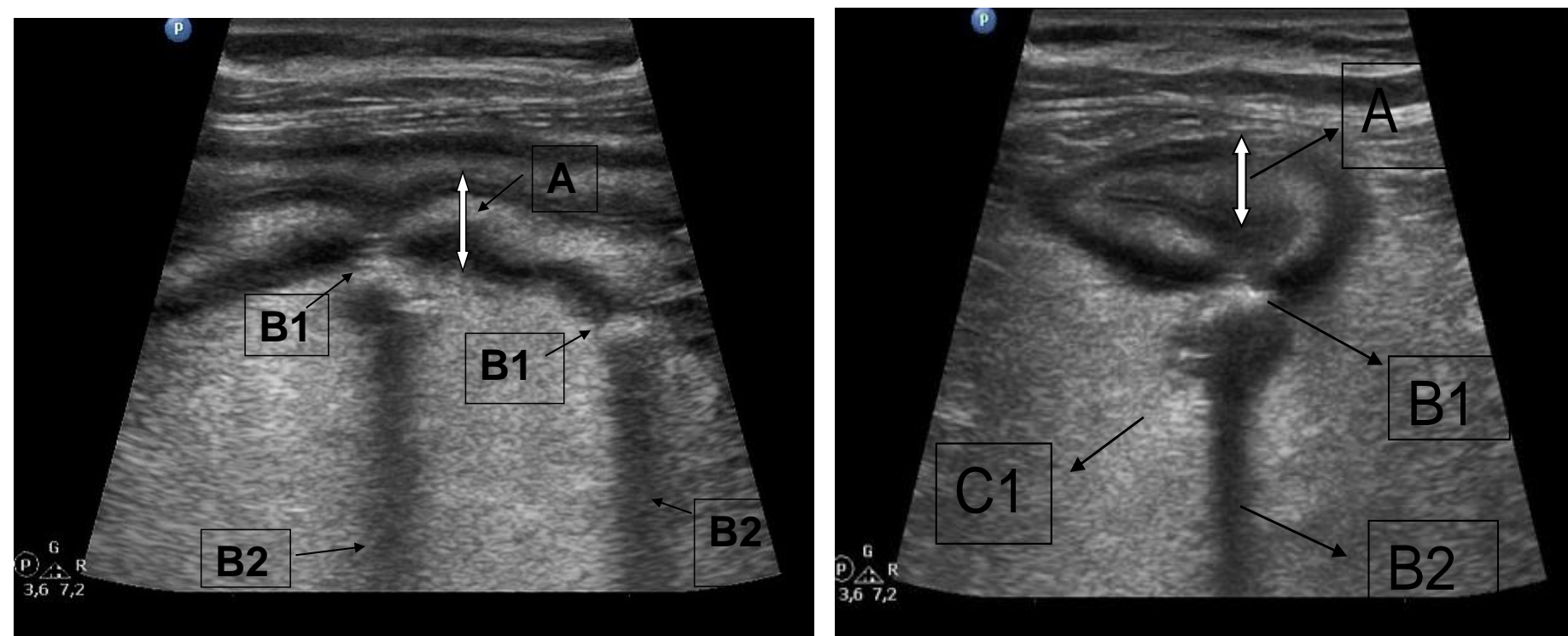


Figure 1
Longitudinal section

Fig.1 and 2 is an example of an **uncomplicated diverticulitis** showing a thick-walled colon, presence of diverticula containing faeces and increased echogenicity of adjacent fat (see Table1).

METHOD

An organised search strategy was conducted using keywords (diverticulitis, diverticular disease, ultraso*,sonog*,computed tomography and CT) derived from the research question. Several databases were searched including CINAHLPlus, MEDLINE, Sciencedirect and Cochrane library. The results were limited to peer reviewed original articles written in English and published between 2008 and 2018. The three most relevant articles which met the inclusion criteria were selected for critical appraisal.

CONCLUSION

US can effectively diagnose only uncomplicated diverticulitis but CT is more accurate in diagnosing complicated forms of diverticulitis. More research should be performed on the influence of sonographer clinical experience on the accuracy of diagnosis in acute abdominal conditions.

RESULTS

In all studies^{5,6,8} the sample size (n = 118 to 183) used was representative of the general population and the appropriate statistical test was employed.

Nielsen et al⁶, US misdiagnosed 79% of patients presenting with a complicated diverticulitis while US and CT results were consistent in 83% of the patients with uncomplicated diverticulitis. This study included only patients who had diverticulitis confirmed by CT meaning that true negatives were excluded from the study and so specificity may be reduced.

Van Randen et al's⁸ prospective study discovered a higher sensitivity for CT (81%) compared to US (61%) but positive predictive values were comparable. Although they didn't differentiate between complicated and uncomplicated CD, their research reflects daily practice because US and CT scans were reported by many operators with a wide variety of experience compared to other studies^{5,6} where scans were evaluated by one or two highly experienced radiologists.

Min et al's⁵ study of adults presenting with right lower quadrant pain postulate that the sensitivity of US (89.04%) results alone did not differ significantly from the net sensitivity (97.26%) of both US and CT. The performance of US in this setting may have been overestimated because the most common form of CD evaluated was uncomplicated. This could be because the traditional Asian diet is of high fibre content which promotes good gut bacteria and decreases the risk of diverticulitis. Asides being limited by its retrospective design, there is an element of spectrum effects and the results may not be applicable to the general population because the study population was limited to only East Asians thereby excluding a mix of individuals from various ethnicities.



An example of a complicated diverticulitis

Figure 3 shows an abscess collection anterior to the thick-walled sigmoid colon (see Table1).

RELEVANCE TO PRACTICE

This review shows that CT is more accurate in detecting complicated forms of diverticulitis because it has a higher sensitivity, can reveal the degree of peritonitis and may provide alternative diagnosis. The major disadvantage of CT is the radiation risk involved however the probability of radiation-induced cancers is thought to be low for doses associated with CT procedures. The safety and ease of US needs to be weighed against its low sensitivity for complicated diverticulitis discovered in this review.

Although the SCoR/BMUS guidelines suggest that US can contribute in the diagnosis of CD, it is operator-dependent and its use can be challenging in differentiating between complicated CD and other bowel pathologies; this may be because the diverticula becomes integrated in the abscess collection and is difficult to identify as a separate entity(see Fig.3). Misdiagnosing a complicated CD has serious implications on patient's management and outcome.

In the clinical setting of uncomplicated CD, US and CT results are comparable^{5,6} mainly because on US, the protruding diverticula is clearly delineated(Fig.1 and 2). The major limitation of this review is that two of the studies were performed in the same country and one could object whether the results can be generalised to other populations. **This review supports the author's local guidelines in the use of CT as the main imaging modality for suspected cases of acute CD and US where CT is contraindicated e.g. in pregnancy.**

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