



Bowel Sounds: Is it Time for Surgeons to Hang-up their Stethoscopes?

Osama Elhardello¹ and John Macfie^{1,2*}

¹Department of General Surgery, Scarborough General Hospital, UK

²The Combined Gastroenterology Research Unit, Scarborough General Hospital, UK

Short Communication

The noises produced by the movement of gas and fluids during peristalsis are bowel sounds or borborygmi. We all have them to a greater or lesser extent. When the bowel is obstructed they become high pitched or tinkling as fluid drips from one distended and tympanic loop of bowel into another. In the presence of peritonitis, classically in association with a perforation, the abdomen becomes silent reflecting an absence of peristaltic activity, so called paralytic ileus. Not surprisingly, therefore, auscultation for bowel sounds is considered an essential part of the assessment of the acute abdomen and it remains common practice to listen to bowel sounds as a determinant of the presence or absence of gut function. But what is the evidence? Is listening to bowel sounds an outdated practice now superseded by readily available abdominal imaging or is they still a useful clinical observation which is easily obtained with minimal discomfort to the patient.

Cannon (1905) wrote the first systematic account of abdominal auscultation in relation to the structure and function of the stomach and intestines [1]. Since then many authors have attempted to relate the properties of a bowel sound, or series of sounds, to precise structural conditions and functional events within the alimentary tract. Advances in technology have allowed various systems to be developed for the objective analysis of bowel sounds. Spectral analysis of bowel sounds was first described by Horn et al. [2] in 1966. Yoshino et al. in 1990 attempted a computer analysis of bowel sounds in intestinal obstruction [3]. They concluded that computer analysis of bowel sounds of mechanical obstruction could provide a very objective assessment of severity, and could help determine the treatment regimen (conservative or operative) of each patient. This was not confirmed by a more recent study reported by Ching and Tang using an electronic stethoscope [4]. They found no correlation between bowel calibre and bowel sound characteristics in both acute small bowel obstruction and acute large bowel obstruction concluding that auscultation of bowel sounds is nonspecific for diagnosing bowel obstruction.

The intrinsic difficulty with the study of bowel sounds is that it is never possible to hear or record exactly the same pattern of bowel sounds with exactly same amplitude, frequency, duration and interval repeatedly and consistently as compared to the consistent sounds produced from the heart, which has a set rhythm and sound characteristics over time. The bowel sounds heard from the same patient will also differ at different times when the patient is re-examined. Not surprisingly therefore the results of studies that have investigated observer variation have consistently found poor results [5].

In 2014, Felder et al. [6], in a prospective study investigated the sensitivity, positive predictive value and intra-rater reliability in a group of recordings from controls with normal gastrointestinal function (n=177), patients with small bowel obstruction (n=19) and patients with post-operative ileus (n=15). CT imaging was used as the gold standard reference point. A total of 10 recordings from each group were replayed through speakers with 15 of them duplicated in order as to determine the intra-rater reliability i.e. the ability of the listener to correctly recognize a duplicate recording. Clinicians (n=41) were blinded and asked to indicate whether the sounds indicated normality, ileus or obstruction. The overall sensitivity for normal, small bowel obstruction and post-operative ileus was 32%, 22% and 22%. The positive predictive values for normal, small bowel obstruction and post-operative ileus were 23%, 28% and 44%, respectively. The intra-rater reliability results for duplicated sounds in normal subjects, small bowel obstruction patients and patients with post-operative ileus were 59%, 52% and 53%. No statistically significant differences were found comparing clinicians with a surgical to a medical background. They concluded that auscultating bowel sounds is not a useful clinical practice and has poor differentiating ability between different bowel diseases.

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*Correspondence:

John Macfie, Department of General Surgery, University of Hull, York NHS FT, Scarborough Hospital, YO12 6QL, UK, Tel: 01723342654; Fax: 01723354031;

E-mail: johnmacfie@aol.com

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Similar conclusions were drawn from the prospective study reported by Breum et al. [7] in Denmark in 2015. In this study, 98 patients with suspected bowel obstruction were recruited and assessed by 53 doctors. Bowel obstruction was confirmed by laparotomy or endoscopy, and 37 patients were proven later to have obstruction. The doctors were blinded for the outcome. Accuracy and inter-observer agreement were generally low leading to their conclusion that clinical decisions should not be based on assessment of bowel sounds.

The evidence would suggest therefore that auscultation of bowel sounds is of limited value as a diagnostic discriminant on their own. What then of the role of bowel sounds as a determinant of gut function and, as a corollary to this are they a reliable aid to the clinician in determining whether or not the patient has a paralytic ileus. This was addressed in a prospective blind observational study by Read et al. [8] in 2017. A total of 124 consecutive adult patients who underwent major abdominal surgery were included. They examined the association between the detection of bowel sounds and evidence of GI function as evidenced by one of the following; passing flatus, opening the bowels or tolerance of an oral intake. Tolerance of oral diet was defined as intake of >1000 mls/24 hrs without vomiting. The presence of bowel sounds was not associated with flatus passage, bowel movement or tolerance of oral intake throughout the 10-day study period. Bowel sounds had a low positive predictive value in predicting flatus, bowel movement and tolerance of oral diet. They concluded that bowel sounds are unreliable as a determinant of whether ileus has resolved or not and is unreliable as a predictor of tolerance of oral feeding in patients with post-operative ileus. Similar conclusions were reached by van Bree and colleagues who reviewed the literature on the clinical utility of listening to bowel sounds in intensive care patients in 2018 [9]. Their search identified only 7 full text publications and no Meta analyses or systematic reviews. They concluded that auscultation with the aim of differentiating normal from pathological bowel sounds is not useful in clinical practice and that low values of inter and intra observer variability preclude the use of bowel sounds for accurate clinical decision making.

In conclusion, listening to bowel sounds has limited utility as an isolated clinical observation. In conjunction with other aspects of abdominal examination they may serve to confirm or refute a putative diagnosis of obstruction or ileus. They serve no purpose as a means of assessing gut function. Nonetheless, it is not yet time for the

surgeon or surgical nurse to hang up their stethoscope. Auscultation of the abdomen remains useful for a number of reasons: it ensures close observation of the abdomen; silence may alert the clinician to the possibility of ileus and symphonic tympany to obstruction. Most importantly, perhaps, is that auscultation facilitates a period of calm reflection in close proximity to the patient.

Authors Contributions

Osama Elhardello: Involved in carrying out the literature review, drafting the manuscript, and in the final approval and submission for publication.

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