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Short Report

Swiss consensus on the management of acute diverticulitis

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Introduction

Acute diverticulitis (AD) is one of the most common clinical conditions encountered in the emergency setting[1]. Possible complications include abscess, perforation, fistulas, obstruction, and bleeding. Fistulas are often the consequence of repeated acute episodes, with localized perforation into adjacent viscera[2]. Multiple AD episodes can also increase the risk of stricture formation. The risk of developing an AD in a patient with diverticulosis is estimated at 4% throughout a patient's lifetime[3].

Management of this condition has recently changed, with guidelines published by the World Society of Emergency Surgery (WSES) and the European Society of Coloproctology (ESCP)[4,5]. However, the levels of evidence are inconsistent and recommendations may vary according to the health systems and the resources available. There can be a lag of years from publication to implementation[6].

Considering these variations and the latest published management recommendations, the aim of the present study was to establish a consensus among colorectal surgeons on the diagnosis and management of AD based on Swiss national practice.

Methods

All Swiss hospitals that performed, according to the national statistics (2015–2017), at least 50 colorectal resections annually, over a 3-year interval, were contacted (52 hospitals). Each centre could include up to three board-certified surgeons at a consultant level, regularly performing colorectal resection for benign and malignant indications. No minimal individual surgeon volume was required. A three-round Delphi consensus was conducted, which is detailed in the *Supplementary Methods*. Consensus was defined as greater than or equal to 70% agreement, either obtained within one single answer or with multiple answers pointing in the same direction (either positive or negative), for questions on a Likert scale (1–2 *versus* 4–5).

Results

Initial evaluation, abdominal imaging, complicated diverticulitis definition, and outpatient management (*Fig. 1*)

Abdominal CT reached consensus as the recommended imaging modality (100%) for diagnosis of AD. Complicated diverticulitis was defined as the presence of an abscess (88%), fistula (84%), pericolic (86%) or distant (83%) free air, and rectal contrast extravasation (95%). Stenosis (62%) and free fluid in the pelvis (40%) or in the upper abdomen (48%) were not deemed to be complicated diverticulitis.

Fever (58%), findings of localized peritonitis (47%), antibiotic requirement (14%), and leucocytes greater than 20×10^9/l (49%) were not considered as contraindications for outpatient management if taken individually. Additional results are available in the *Supplementary material*.

Non-operative/operative treatment and elective surgery (*Fig. 2*)

Antibiotic treatment and percutaneous drainage are described in *Fig. 2*. In the case of drainage, no consensus was reached on the necessity to perform control abdominal imaging (51%).

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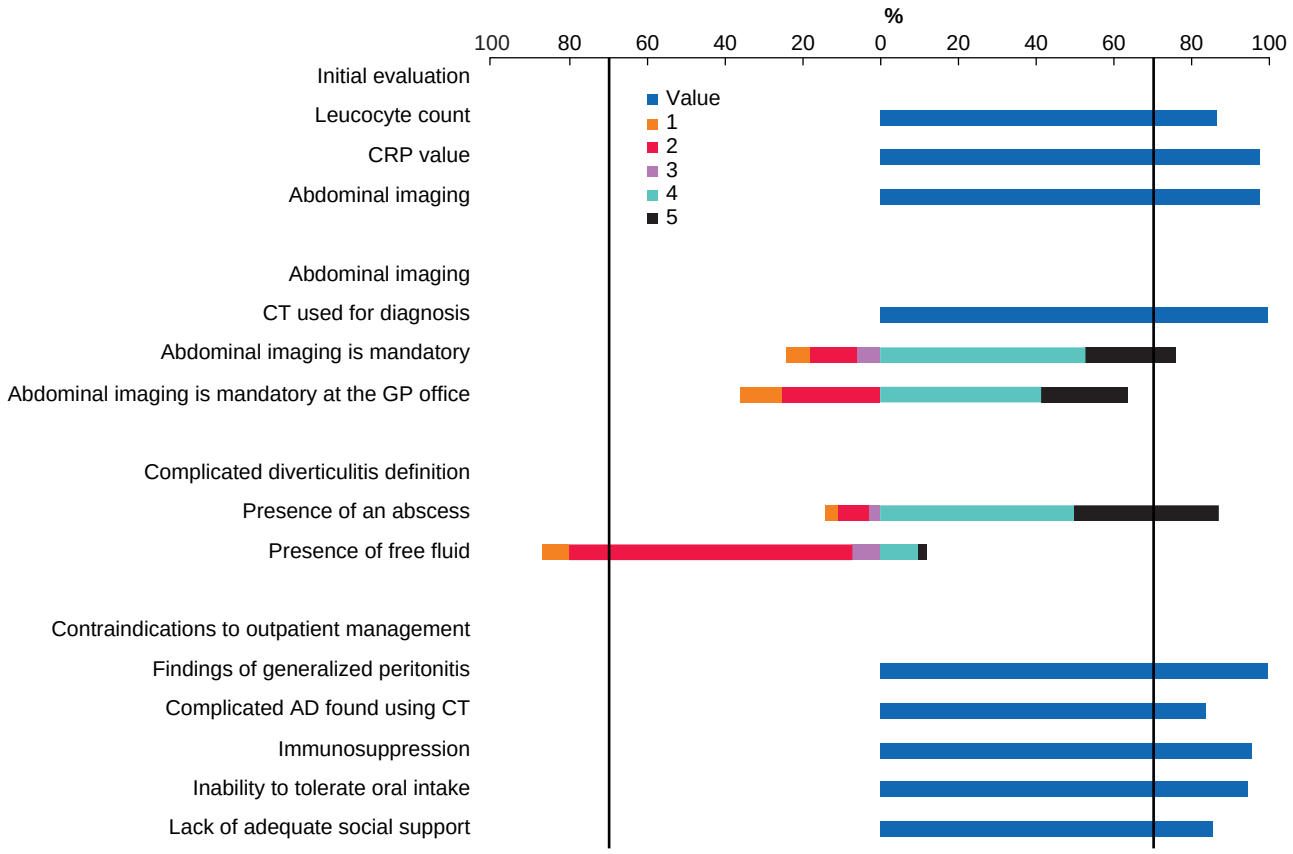

Fig. 1 Initial evaluation, abdominal imaging, complicated diverticulitis definition and contraindications to outpatient management

Likert scale: 1, strongly disagree; 2, partially agree; 3, neutral; 4, agree; and 5, strongly agree. CRP, C-reactive protein; GP, general practitioner; AD, acute diverticulitis.

No procedure reached consensus for surgical management in the emergency setting (*Fig. 2*). Primary anastomosis was the preferred option when the patient is stable (77%) (stapled end to end, 73%). From a technical point of view, no consensus was reached on the type of dissection (28% for total mesorectal excision *versus* 42% for close-to-bowel dissection). Insertion of a pelvic drain (90%) reached consensus for emergency procedures.

Elective surgical resection was recommended in patients with persistent symptoms (95%) or immunosuppression (89%). Age (14%) and number of episodes of recurrent AD (27%) were not considered criteria for elective surgery. Standard planned elective sigmoidectomy after a complicated case of AD (42%) or after a percutaneously drained abscess (65%) did not gain consensus. Laparoscopic resection was the favoured approach for elective sigmoidectomy (98%). Additional results are available in the *Supplementary material*.

Discussion

Swiss colorectal surgeons reached consensus on the management of AD with regard to diagnosis, outpatient management, and indication for elective surgery. Emergency surgical management did not reach consensus.

Many radiological classifications have described the different stages of diverticular disease; however, none is currently universally accepted[7]. This was also apparent in this study. The definitive treatment for each stage also depends on the clinical condition and patient co-morbidity. More recent classifications (Sallinen and WSES) that combine clinical, radiological, and physiological parameters were not considered in this study, limiting the generalization of the results in clinical practice[8,9].

Non-operative management of AD has changed over the past few decades. Two randomized controlled studies (AVOD and DIABOLO trials) confirmed that this approach was not associated with a higher recurrence or rate of sigmoidectomy[10,11]. However, controversies and habits tend to persist, as highlighted in the present study, where a consensus was reached in favour of antibiotic treatment[10–13]. In ESCP guidelines, antibiotics are recommended for immunocompromised patients or sepsis[5]. Percutaneous drainage of a pericolic abscess is another unresolved question. A systematic review revealed comparable treatment failure rates for antibiotics (19.9%) and percutaneous drainage (20.8%)[14]. Based on these results, it was suggested that abscesses greater than 4 cm should be drained, confirming the results of the present study.

A systematic review demonstrated that outpatient management of AD was safe, but no criteria of failure were identified, which makes patient selection difficult[15]. The present study identified subjective contraindications for outpatient management, such as generalized peritonitis, immunosuppression, or complicated diverticulitis. These criteria were assessed individually, not in combination. Management decisions should be made based on the general and physiological condition of the patient.

The present study reached a consensus on the necessity for emergency surgery in patients with sepsis. However, the levels of evidence are inconsistent in patients with perforation without haemodynamic instability[5]. WSES guidelines suggest a Hartmann procedure in patients with faecal peritonitis or sepsis[4]. Conversely,

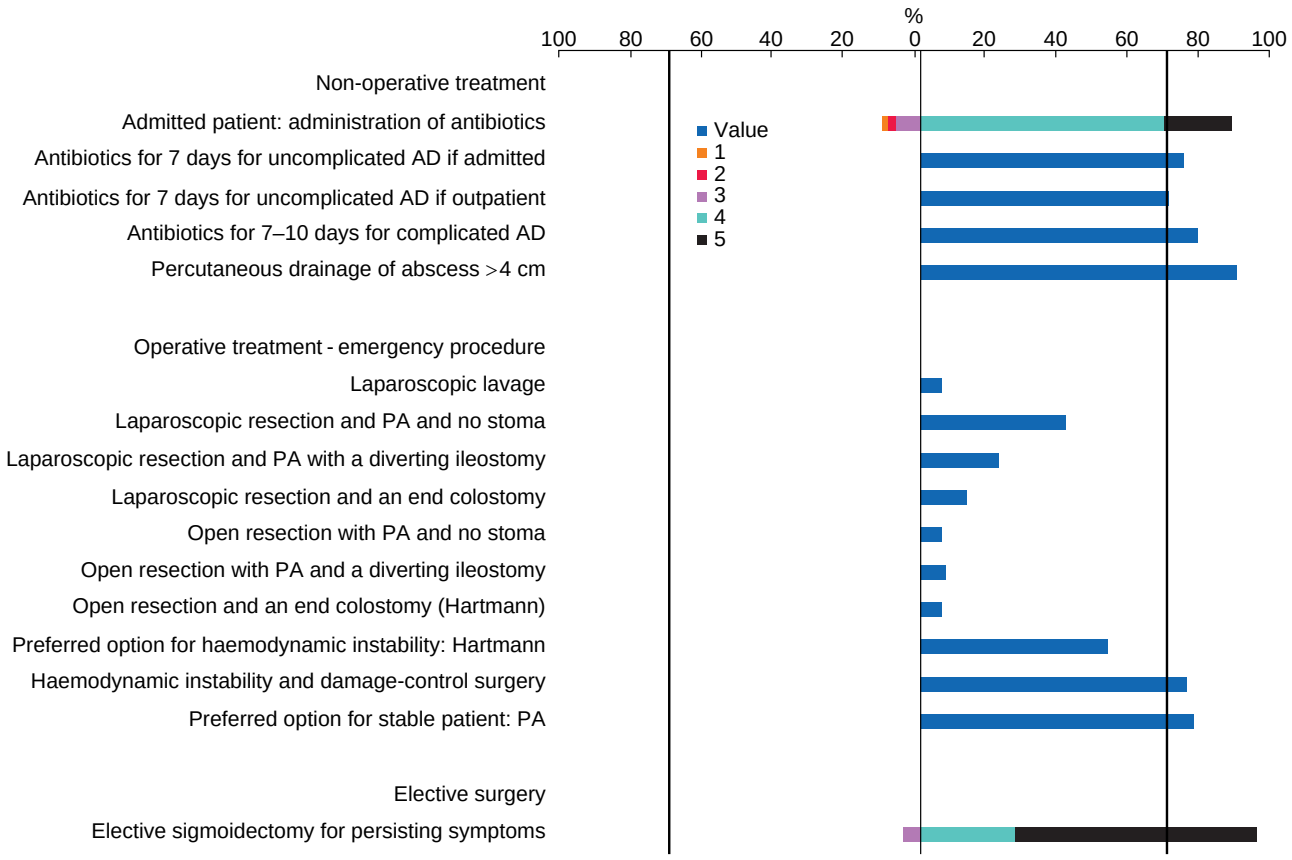

Fig. 2 Non-operative/operative treatment and elective surgery

Likert scale: 1, strongly disagree; 2, partially agree; 3, neutral; 4, agree; and 5, strongly agree. AD, acute diverticulitis; PA, primary anastomosis.

ESCP guidelines state that the choice of the procedure should be left to the surgeon, according to their experience, but resection is recommended[5]. The present study has not established a consensus on the most appropriate surgical technique. The experience and the logistics according to the hospital (ICU, theatres, and out-of-hours access) probably play an important role in decision-making. Damage-control surgery (DCS) is an option in unstable patients. A retrospective study of 203 consecutive patients treated with DCS by applying a decision algorithm for severe intra-abdominal sepsis confirmed that it was feasible and 65% of patients were stoma free at hospital discharge[16]. However, none of the guidelines recommends DCS over a Hartmann procedure[4,5]. Indications, timing, and techniques of the DCS approach need to be further assessed (for example primary anastomosis with a diverting loop ileostomy or Hartmann procedure).

The use of laparoscopic lavage for purulent peritonitis is controversial; however, due to the lack of proof supporting its inferiority, this technique may be used according to the ESCP guidelines[5]. The present study demonstrated no consensus for the role of laparoscopic lavage. The SCANDIV trial results suggested that the use of laparoscopic lavage *versus* primary resection did not reduce severe postoperative complications and led to a higher reoperation rate[17,18].

The target surgeon group was chosen to include colorectal experts, aiming to provide a well-founded basis for the diagnosis and management of AD. This study addressed the question in a methodologically robust way. The Delphi technique is a widely used and validated method to transform opinion into group consensus among experts and specific questions or issues[19]. The aim of the study was not to generate new guidelines for AD, but to confirm/challenge them within a group of national experts, as published guidelines are not systematically accepted or applied in practice today.

Collaborators

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T.G. and D.M. contributed equally and share first authorship.

Disclosure

The online voting system was made available by Johnson&Johnson, Switzerland. The authors declare no other conflict of interest.

Supplementary material

Supplementary material is available at *BJS Open* online.

Data availability

Data are available on request.

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