

Clinical strategies for the management of intestinal obstruction and pseudo-obstruction.



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A Delphi Consensus study of SICUT (Società Italiana di Chirurgia d'Urgenza e del Trauma)

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Clinical strategies for the management of intestinal obstruction and pseudo-obstruction. A Delphi Consensus study of SICUT (Società Italiana di Chirurgia d'Urgenza e del Trauma)

BACKGROUND: Intestinal obstructions/pseudo-obstruction of the small/large bowel are frequent conditions but their management could be challenging. Moreover, a general agreement in this field is currently lacking, thus SICUT Society designed a consensus study aimed to define their optimal workout.

METHODS: The Delphi methodology was used to reach consensus among 47 Italian surgical experts in two study rounds. Consensus was defined as an agreement of 75.0% or greater. Four main topic areas included nosology, diagnosis, management and treatment.

RESULTS: A bowel obstruction was defined as an obstacle to the progression of intestinal contents and fluids generally beginning with a sudden onset. The panel identified four major criteria of diagnosis including absence of flatus, presence of >3.5 cm ileal levels or >6 cm colon dilatation and abdominal distension. Panel also recommended a surgical admission, a multidisciplinary approach, and a gastrografin swallow for patients presenting occlusions. Criteria for immediate surgery included: presence of strangulated hernia, a >10 cm cecal dilatation, signs of vascular pedicles obstructions and persistence of metabolic acidosis. Moreover, rules for non-operative management (to be conducted for maximum 72 hours) included a naso-gastric drainage placement and clinical and laboratory controls each 12 hours. Non-operative treatment should be suspended if any suspects of intra-abdominal complications, high level of lactates, leukocytosis (>18.000/mm³ or Neutrophils >85%) or a doubling of creatinine level comparing admission. Conversely, consensus was not reached regarding the exact timing of CT scan and the appropriateness of colonic stenting.

CONCLUSIONS: This consensus is in line with current international strategies and guidelines, and it could be a useful tool in the safe basic daily management of these common and peculiar diseases.

KEY WORDS: Delphi study, Intestinal obstruction, Large bowel obstruction, Pseudo-obstruction, Small bowel

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Introduction

Acute GI obstruction was and continues to be one of the most common reasons requiring hospitalization and emergency surgical consultation. Although it is often considered a “benign disease”, an intestinal obstruction could be a severe condition, since its complications may include life-threatening clinical pictures such as bowel ischemia or intestinal perforation¹⁻⁹.

Intestinal obstructions are usually classified based on the bowel location, thus they could be differentiated into small bowel obstructions (SBO) or large bowel obstructions (LBO).

About 75% of the SBO are caused by peritoneal adhesions which could be formed following a laparotomy. Indeed, even though any surgical procedure may predispose to the formation of adhesions, interventions at the lower abdomen or at the pelvis sites are those more frequently complicated by the development of adhesive bands, especially if the peritoneal cavity has been contaminated with the enteric fluids or purulent collections¹⁰⁻¹¹. Typical presentation of patients with SBO include abdominal distention, vomiting and crampy abdominal pain. Opposite, patients with large bowel obstructions (LBO) usually present with abdominal pain, distention and constipation, while vomit is less common and usually presents lately.

Of note, the severity of presentation and vomit characteristics of both SBO and LBO may vary according with the site and the degree of obstruction¹²⁻¹³.

LBO usually affect the elderly and more than 50% of the cases are due to colorectal cancers. Volvulus accounts for another 10–17% of LBO, occurring more frequently in the sigmoid colon or in the cecum. Diverticular strictures or complications of acute diverticulitis, such as abscess, are the cause of about 10 % of LBO¹².

Other less frequent causes of SBO and LBO include radiation therapy, Crohn's disease, intussusceptions, ischemia, gallstone and bezoars.

Symptoms of SBO and LBO can simulate a peculiar disease called intestinal “pseudo-obstruction”. This term was first introduced more than 60 years ago by Dudley and associates¹⁴ who investigated a small case-series of patients with an obstruction unexplained by any mechanical cause, thus the diseases was referred as *spastic ileus*. Currently, a “pseudo-obstruction” is defined as a disease characterized by clinical and radiological symptoms and signs of an intestinal obstruction, without evidence of any lesions occluding the gut lumen¹⁵.

Sir Heneage Ogilvie¹⁶, first described acute colonic pseudo-obstruction (ACPO), also called acute colonic ileus or Ogilvie's syndrome, in 1948. Although the exact etiology is still unclear, it has been hypothesized that an excessive sympathetic stimulation, combined with suppressed parasympathetic activity, leads to a state of adynamic ileus. ACPO is most frequent in males and patients are mostly elder and hospitalized. Symptoms

usually develop over a few days and are similar to those of a true obstruction, including abdominal distention, pain, nausea, and vomiting, even though the alvus may range from obstipation to paradoxical diarrhea¹⁶⁻¹⁹.

Even if the morbidity and mortality due to intestinal obstructions declined since the introduction of more sophisticated diagnostic tests and imaging workout, these conditions remain a challenge for those clinicians who have to assess a proper diagnosis.

On the basis of this background, this study was designed aiming to reach a consensus strategy among a group of Italian national experts, regarding the optimal clinical management of patients presenting with intestinal obstruction or pseudo-obstruction.

For the purpose of the study, the Italian Society of Emergency and Trauma Surgery (SICUT) nominated a panel of experts who were consulted using the Delphi methodology. This approach, named after the Oracle at Delphi, is an internationally validated group facilitation technique that searches for a consensus about specific items through a series of interview rounds. It allows the collection of experts' opinions without the need to bring people physically together; moreover, following each round, each participant is able to reconsider his/her answers in the light of the views expressed by others²⁰⁻²³.

Materials and Methods

STUDY DESIGN

Study began on March 2015 when the SICUT board members identified two study coordinators (GC and PR) who selected the topics for the Delphi study through a bibliographic search. For the purpose of the choice of methodology, the topics selection, and for the results publication, a computer search of the National Library of Medicine MEDLINE database (PubMed) was performed in March 2015 and extended to January 2016, using the following search strings:

Search strategy #Meth) keywords: “delphi technique” [MeSH Terms] AND “delphi”[Title] AND (Review [ptyp] AND “2000/01/25” [PDAT] : “2016/01/22” [PDAT]) AND (“humans” [MeSH Terms] AND English [lang]);

search strategy #1) keywords: (“intestinal obstruction”[MeSH Terms] AND “intestine, small”[MeSH Terms]) OR “small bowel obstruction” [Title] AND (Review[ptyp] OR Clinical Study[ptyp] OR “guidelines as topic”[MeSH Terms]) AND “2005/01/15” [PDAT] : “2016/01/13”[PDAT] AND “humans”[MeSH Terms]) NOT (case reports[pt] OR letter[pt] OR comment[pt] OR news[pt]);

search strategy #2) keywords: (“intestinal obstruction”[MeSH Terms] AND “intestine, large” [MeSH Terms]) OR “large bowel obstruction” [Title] AND (Review[ptyp] OR Clinical Study[ptyp] OR “guidelines

as topic" [MeSH Terms]) AND "2005/01/15" [PDAT] : "2016/01/13"[PDAT] AND "humans"[MeSH Terms]) NOT (case reports[pt] OR letter[pt] OR comment[pt] OR news[pt]);

search strategy #3) keywords: ("intestinal pseudo obstruction"[MeSH Terms] OR "pseudo obstruction"[Title] AND (Review[ptyp] OR Clinical Study[ptyp] OR "guidelines as topic" [MeSH Terms]) AND "2005/01/15"[PDat]: "2016/01/13" [PDat] AND "humans"[MeSH Terms]) NOT (case reports [pt] OR letter [pt] OR comment [pt] OR news [pt]).

Search strategy for #Meth identified 98 items. Search strategy for search#1 identified 177 papers; otherwise, search#2 and search#3 identified 139 and 100 manuscripts respectively.

Analogous searches providing 21 papers covered the Scopus, the Cochrane Collaboration, and the Google Scholar databases in order to gather others remaining evidences, synopses and guidelines on the topic.

One author (LL) collected literature data while the two coordinators (GC and PR) evaluated papers independently. Significant references from the retrieved publications were also included. The study coordinators did not consider any journal's or authors' score (*e.g.*, journal's Impact Factors, citation report, h-index) of published articles as inclusion/exclusion criteria. Each paper retrieved was assessed for possible inclusion in our study, primarily by revision of titles and/or abstracts and finally after reading the article; publications with English language abstract not available and/or of low interest in the specific topics and key questions were not taken into account. Furthermore, duplicate records or redundant references from the same authors' group were removed by manual search. Whenever possible, the papers were classified for evidence strength following the Oxford CEBM 2011 scheme. In accordance with the PRISMA flowchart for systematic literature review, our search provided the final selection of 92 citations. References focused on Delphi survey technique²⁰⁻²⁸ and on 4 main topic areas to structure the questionnaires (nosology, diagnosis, management, treatment), regarding SBO²⁹⁻⁵³ caused mainly by adhesions, LBO⁵⁴⁻⁷⁸ due to cancer or other causes, and pseudo-obstructions⁷⁹⁻⁹² by adynamic ileus, Ogilvie's syndrome, and other non-mechanical conditions.

PANEL OF EXPERTS

On April 2015, the SICUT board members approved the panel selected by the two coordinators. The panel included the members of the SICUT board, those Italian emergency surgeons retrieved from the literature search with at least 5 years of personal experience and with outstanding research qualities and qualified members of surgical Italian Departments with clinical-scientific background in this field supported by the others selected members (the so called snowball referral).

Since there are no clear guidelines regarding the num-

ber of experts to be included, for the purpose of this study, a panel size of at least 30 experts was considered appropriate.

Invitations were then mailed to 40 surgical centers (three declined). Accordingly, a collaboration group of experts willing to participate, was constituted and named "OBOW (Obstructive-Bowel) SICUT Collaborative Study Group" (see Appendix 1).

QUESTIONNAIRES AND ROUNDS

According to the Delphi methodology an un-defined number of rounds can be performed until a consensus has been reached among the experts, but as outlined in Fig. 1, the present study consisted of two rounds.

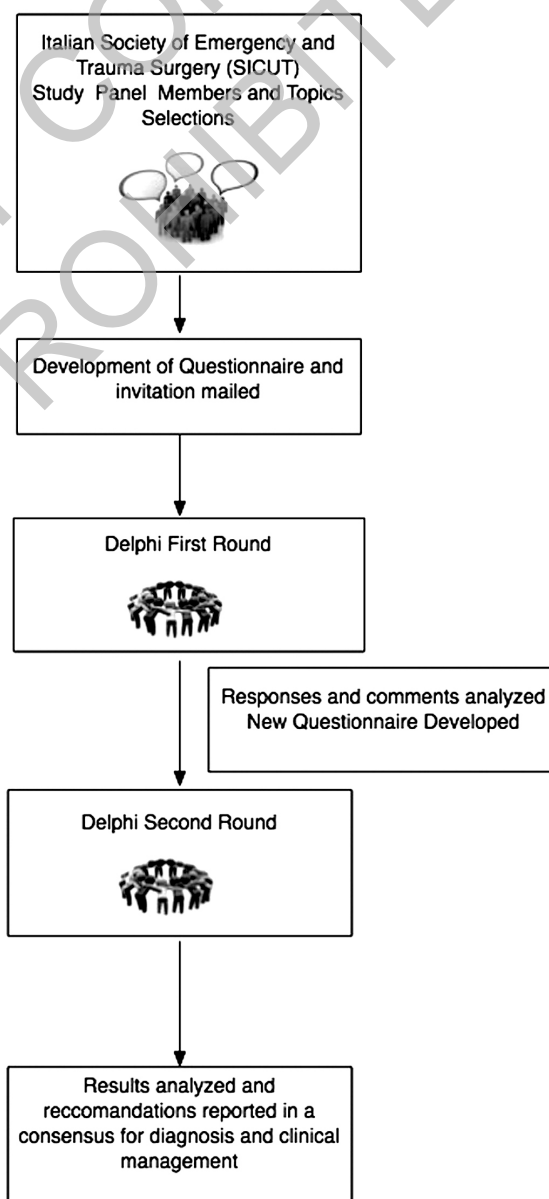


Fig. 1: Delphi consensus round and study design.

Before the first round launch, an external epidemiologist colleague (FS), not experienced in Delphi method, was asked to test the feasibility and the comprehension of the survey and questionnaire.

Questionnaires were e-mailed to all participants in both rounds. Reminders were sent to non-responders on a regular basis, with a maximum of three reminders per person. Questionnaires of both rounds consisted mainly of three parts: nosology, diagnosis and treatment strategies.

The participants were asked to answer assuming that all required facilities and an adequate clinical setting were at one's disposal (i.e. 24/7h availability of CT scan, interventional radiologists, operation theaters and emergency surgeons).

Questionnaires were designed with different type of answers such as yes or no, multiple choice, check-off or open, and Likert scale. The latter was based on 7-point layout ranging from 1 (totally disagree) to 7 (completely agree).

The first round consisted of 23 items (including 98 variables) and the second round consisted of 12 items (including 47 variables). The first round questionnaire ended on May 2015; following, results were analyzed and a second questionnaire was developed on August 2015. Second round ended on 5th October 2015.

Of note, during the second round, remarks and suggestions of the first round were also incorporated, but questions where consensus was reached in the first round were omitted. During the 43^o SICUT National Congress held in Milan on 22nd October 2015, the final results were presented, discussed and approved by the panel of experts. Accordingly, the following features of a consensus method were further applied: anonymity, iteration, controlled feedback, and statistical group response^{24,25,27}.

STATISTICAL ANALYSIS AND REPORTING OF QUESTIONS

For the purpose of data collection and analysis an excel-based SPSS Database was constituted by two authors (BF, FS) using the 17.0 version of the PASW Statistics Program (SPSS Italy, Bologna) for MacOSX. Data from the two rounds of questions were reported and analyzed separately. Consensus was defined as an agreement equal or greater than 75% between respondents (number of identical answers divided by the number of respondents) or a mean value of 5.26 of the Likert scale, thus corresponding to a value >75% out of 7.

Results

PARTICIPANTS

During a 6-month period, 33 out of 37 centres invited (89.1%), including 47 surgeons with clinical and scientific expertise in emergency abdominal surgery, filled out the first round questionnaire. Following 25 out of 33

centres participants (75.7%) completed the second round.

CONSENSUS AGREEMENT

Fig. 2 reports different types of agreement that were obtained through the survey, whereas Table I reports only results where strong consensus was reached.

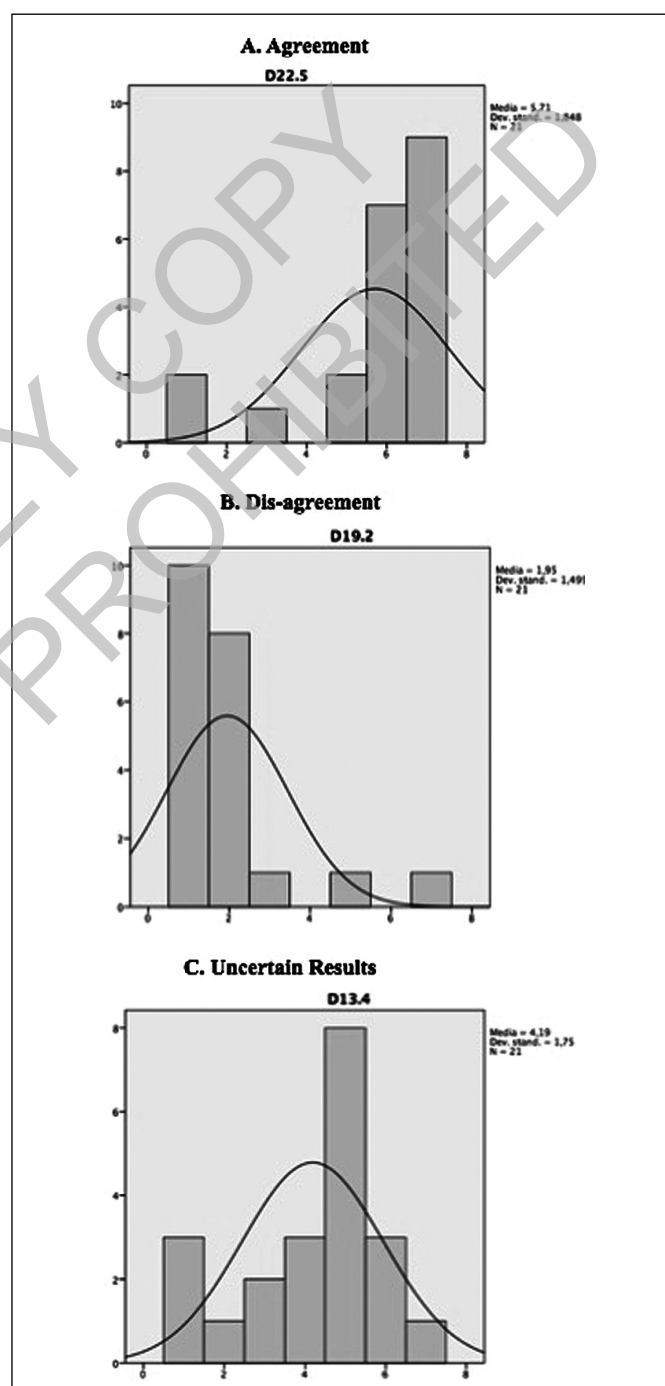


Fig. 2: Results provided by Delphi methodology. A. Graph bars showing agreement; B. Graph bars showing dis-agreement between panel members; C. Graph bars showing uncertain results.

Table I. - SICUT Delphi consensus agreement for intestinal obstructions and pseudo-obstruction – (Likert scale)

	AGREEMENT	MEAN; SD	95% CI
A) NOSOLOGY			
Obstacle to the progression of intestinal contents and fluids generally beginning with a sudden onset	80.4%	5.63; 2.01	4.75-6.42
B.1) DIAGNOSIS – MAJOR CRITERIA			
Absence of flatus	88.8%	6.22; 1.20	5.70-6.65
Air-fluids ileal levels (>3.5 cm)	87.0%	6.09; 1.31	5.48-6.57
Colon dilatation (>6 cm)	80.7%	5.65; 1.66	4.96-6.26
Abdominal distension	78.2%	5.48; 1.70	4.83-6.17
B.2) DIAGNOSIS – MINOR CRITERIA			
Obstipation (absence of stool passages)	80.5%	5.64; 1.78	4.91-6.27
B.3) DIAGNOSIS - RULES			
Clinical & radiological	94.4%	6.61; 0.85	6.22-6.94
At least 1 Major Criteria	85.7%	6.0; 1.64	5.28-6.67
B.4) DIAGNOSIS - RADIOLOGY			
X-ray	97.0%	6.79; 0.65	6.55-6.97
CT Scan	90.4%	6.33; 1.34	5.85-6.76
C.1) SBO- LBO CLINICAL MANAGEMENT AND RISK ASSESSMENT			
Surgical Department admission	80.4%	5.63; 2.01	4.75-6.33
Gastrografin swallow	83.7%	5.86; 1.50	5.25-6.39
Multidisciplinary approach for risk assessment	79.1%	5.53; 2.35	4.33-6.60
Clinical scores utility	75.2%	5.27; 1.75	4.33-6.07
APACHE-II	75.2%	5.27; 2.08	4.27-6.20
P-POSSUM	76.0%	5.32; 1.56	4.58-5.88
C.2) PSEUDO-OBSRUCTION CLINICAL MANAGEMENT			
Observation/ Medical therapy	91.2%	6.39; 1.03	6.0-6.71
Colonic/rectal decompression (probe)	77.6%	5.43; 2.15	4.61-6.18
C. 3) TREATMENT – CRITERIA FOR IMMEDIATE SURGERY			
*Strangulated hernia	100.0%	n/a	n/a
*Cecal dilatation (>10 cm)	90.9%	n/a	n/a
*Vascular pedicles obstructions	87.9%	n/a	n/a
*Persistent metabolic acidosis	81.8%	n/a	n/a
C.4) RULES FOR NON OPERATIVE MANAGEMENT – NOM			
Naso-gastric drainage placement	93.4%	6.54; 1.10	6.11-6.86
Maximal duration 72 hrs	84.1%	5.89; 1.77	5.14-6.50
Clinical and lab controls each 12 hrs	81.5%	5.71; 1.88	4.89-6.36
C.5) CRITERIA FOR NOM INTERRUPTION			
Clinical or radiological suspect of intra-abdominal complications	93.7%	6.56; 1.16	6.09-6.88
High level of lactates	88.4%	6.19; 1.49	5.63-6.63
Leukocytosis (>18.000/mm ³ or Neutrophils >85%)	81.2%	5.69; 1.71	5.09-6.22
Fever (>38.5°C)	79.4%	5.56; 1.84	4.94-6.16
High Creatinine level (double comparing level detected upon admission)	76.8%	5.38; 1.80	4.78-5.94

* Multiple choice question

The two rounds provided some items of uncertain consensus regarding the timing of CT abdominal scan in SBO along with the use of i.v. contrast medium, thus, these items were not included in this report and are still under investigation.

Table I summarizes results of the Delphi study: accordingly, a bowel obstruction was defined as an obstacle to the progression of intestinal contents and fluids general-

ly beginning with a sudden onset with a consensus of 80.4%.

Strong consensus was reached also regarding type of diagnosis, both clinical and radiological. Accordingly, the panel identified four major criteria (absence of flatus, presence of >3.5 cm ileal levels, a colon dilatation >6 cm, and the presence of an abdominal distension) and one minor criteria (absence of stool passage), whereas a

presentation with “abdominal pain” reached exclusively a moderate agreement (73.4%) as minor criteria.

Clinical rules for diagnosis should include at least one major criteria, however the work-out should include also a radiological evaluation, performed with plain X-Rays (first choice modality) and CT scan mandatory for patients presenting with LBO and pseudo-obstruction, otherwise upon clinical judgement in case of SBO.

The vast majority of the items focused on the clinical management were considered unanimously, as the need of a surgical department admission, a multidisciplinary evaluation approach and the recommendation for a gastrografin swallow. Conversely, even if clinical scores (e.g. APACHE-II and P-POSSUM) were overall considered useful in risk assessment, the value of the ASA score reached just a moderate agreement (74.1%).

On the same extent, the consensus was only moderate with respect of the endoscopic decompression and the prostigmin treatment for patients presenting intestinal pseudo-obstructions (74.4% and 72.4% respectively).

Furthermore, criteria for immediate surgery were quite mandatory for all surgeon interviewed with respect of hernia strangulation, a cecal dilatation >10 cm, signs of mesenteric pedicle vascular obstructions and the presence of a persistent metabolic acidosis. However, the panel showed minor agreement regarding a localized Blumberg

sign (66.7%), the presence of a continuous and spontaneous pain (66.7%) and CT signs of modified bowel enhancement (66.7%) or caliber modifications (69.7%). Moreover, rules for SBO non-operative management (NOM) included a naso-gastric drainage placement and clinical and laboratory controls each 12 hours; the use of antibiotics was not considered a standard (agreement 55.5%). NOM duration should not be longer than 72 hours. With closely monitoring, in selected high-risk patient the NOM could be extended up to 6 days (agreement 60.9%). Nevertheless, the panel agreed in suspending the NOM if any suspect of intra-abdominal complications appears, if onset of high level of lactates, WBC, or creatinine is observed or in the presence of SIRS (Table I).

SBO AND LBO CLINICAL MANAGEMENT

Based on the agreement reached within the present study, the OBOW Consensus Study group developed two clinical management flow-charts for those patients admitted to a surgical ward with a diagnosis of SBO (Fig. 3) and LBO (Fig. 4). For the latter type, it is important to highlight that it was not reached a general agreement among surgeons, regarding the use of the colonic stent

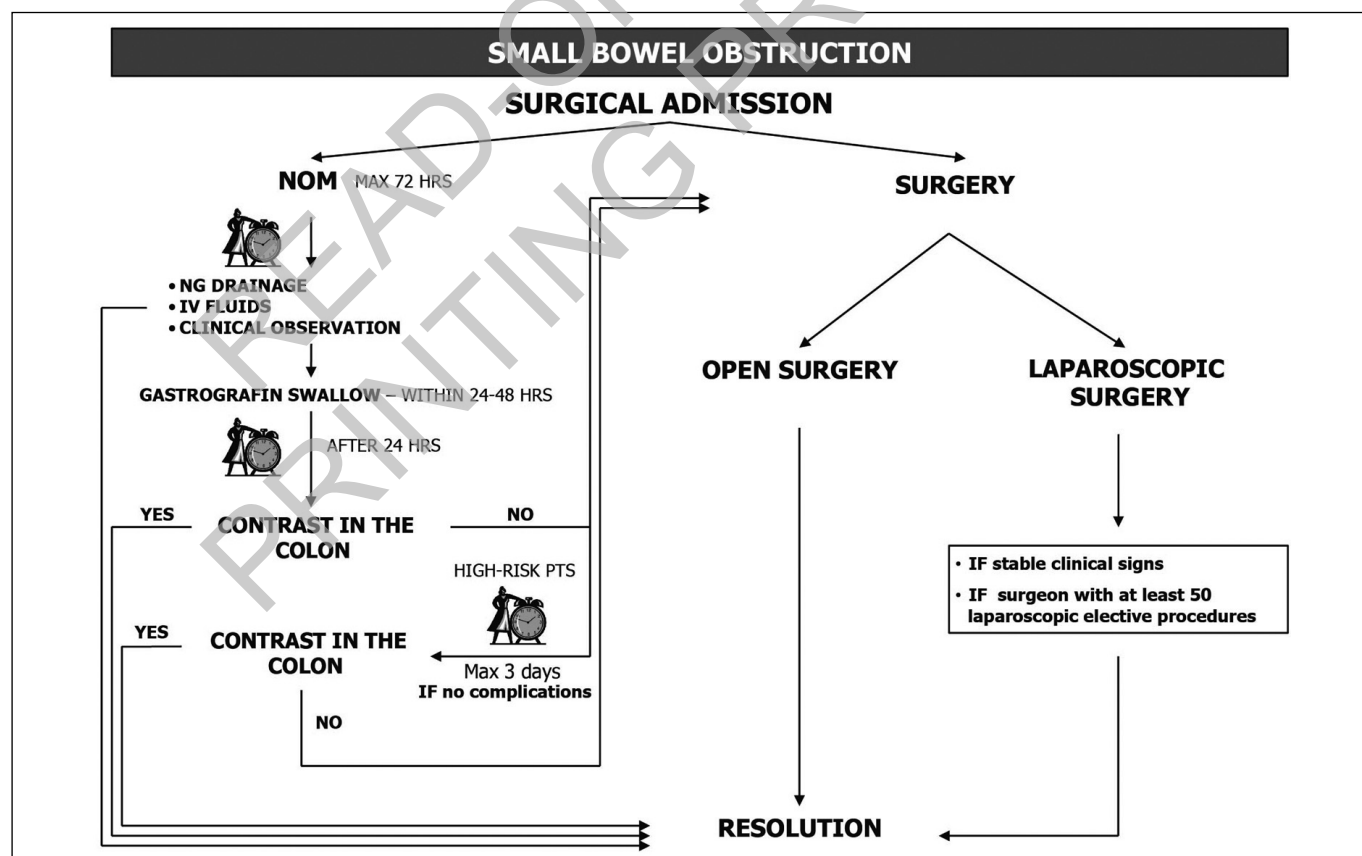


Fig. 3: Small bowel obstruction. Clinical management flow-chart according to SICUT recommendations.

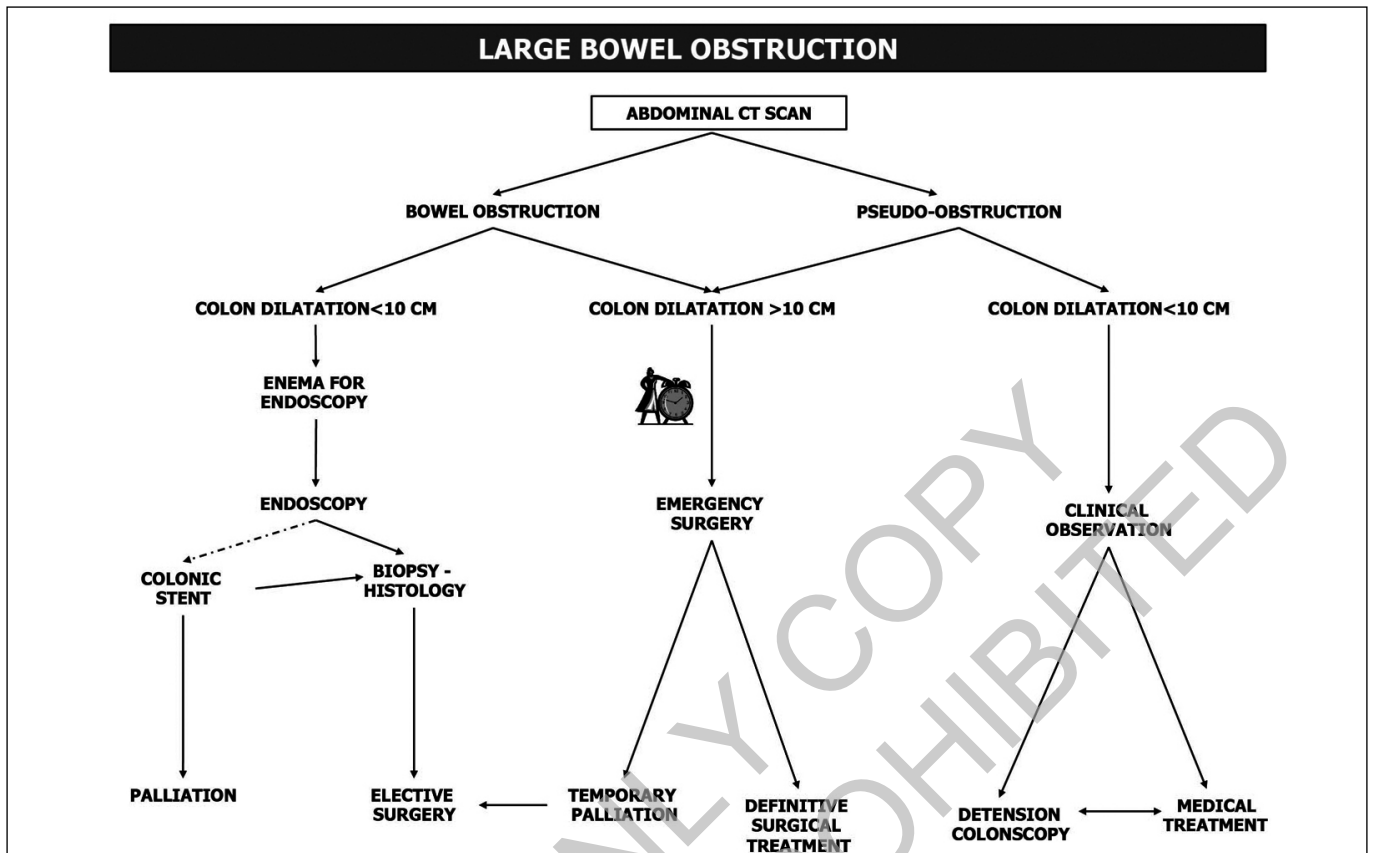


Fig. 4: Large bowel obstruction. Clinical management flow-chart according to SICUT recommendations.

as a bridge to surgery. Indeed the panel felt necessary the evaluation and referral for its appropriateness to a specialized GI endoscopist who will perform the procedure in relation to the location of the obstruction and patient's performance *status*. Accordingly, this option has been taken into account in the flow-chart but was not included in the consensus agreement.

Discussion

This study reports a consensus agreement regarding the clinical management of SBO, LBO and intestinal pseudo-obstruction that has been developed using the Delphi methods among a panel of Italian experts.

The research has been conducted strictly adhering to the methodology recommendations stated by Hasson and co-authors and including: a clear explanation of the clinical problem and rationale and of the literature review, detailed report of the methods (experts selection process, number of rounds performed, statistical analysis) and results (response rate for each round, consensus and issues regarding disagreement)²⁵.

The main advantage of the Delphi method is the achievement of consensus in a given field when there is a lack of empirical evidence. The Delphi has been described as

a quick, inexpensive and efficient way to combine the knowledge and abilities of a group of experts, although others argued that extensive time commitment is needed. A key issue of this approach is the panel selection: indeed, the Delphi method does not call for an expert panel to be a representative sample for statistical purposes, but qualities of the experts selected seems to be more important rather than its number²¹. Others also stressed that one of the key principles of the Delphi, the anonymity, may also encourage hasty decisions. The Delphi approach is particularly attractive for the task of reaching consensus, especially among health care professionals; however, the determination that a consensus has been finally achieved requires also an operational definition. Although this notion is fundamental to all the Delphi studies, the definition of what constitutes consensus is nevertheless less clear. According to a recent systematic review conducted by Diamond and associates, the most common definition for consensus among studies using the Delphi method, was a percent agreement, with 75% being the median threshold, thus consistent with our approach²⁴.

The present manuscript focused in particularly on intestinal obstructions. An acute GI obstruction occurs when the normal course of intestinal contents is interrupted. The obstacle can occur at any level throughout the gastrointestinal tract, thus signs and symptoms may change

accordingly. An early recognition of the condition and the establishment of an appropriate treatment are consequently mandatory. Usually, the diagnostic process involves imaging including X-Rays, ultrasonography and CT scans^{8,35}.

The herein presented OBOW (Obstructive-Bowel) SICUT Collaborative Study Group, has reached a strong consensus agreement regarding the definition of the condition and the type of diagnosis (that should be clinical and radiological), as for the need of an admission to a surgical ward.

Despite the contributions by many of the leaders of general surgeons during the last century, the optimal management of patient with SBO remains controversial. Indeed, when either SBO or LBO result in clear clinical or CT findings of ischemia, perforation or peritonitis, emergency surgery is required⁸. In every other cases, the following question remains open: what patients can be safely treat conservatively? Theoretically, all patients with uncomplicated obstruction could be submitted to a conservative management (NOM), including fluid and electrolyte replacement, intestinal decompression and bowel rest. Unfortunately, there are no uniform strategies regarding indications for or timing of operation. The decision to operate is frequently at the discretion of the individual surgeon often following the old paradigm that the sun should never rise or set on a small bowel obstruction. Many authors reported that a delay in definitive treatment of complete SBO can result in a significant increase in bowel resection as well as morbidity and mortality. On the other hand, studies on the natural history of SBO indicate that almost the 80% of patients will respond to NOM³. Therefore, in the early 21st century, the Eastern Association for the Surgery of Trauma (EAST)³³ developed guidelines offering some evidence-based recommendations for the diagnosis and treatment of SBO; in the same field, a panel constituted by 13 international experts participated in the statement of the Bologna Guidelines³¹ for patients presenting with adhesive small bowel obstructions. Such guidelines, which could be considered as milestones in Italy and worldwide, reported that in absence of strangulation and history of persistent vomiting or CT scan signs of free fluid, mesenteric oedema, small bowel faeces sign and devascularized bowel, patients can be managed safely with NOM. Of note, NOM patients have shorter hospital stay, but present a higher recurrence rate and shorter time to readmission. Risk factors for recurrences are young age (<40 years) and matted adhesions. At present, many international guidelines advocate NOM as the first therapeutic option to treat SBO. Therefore, an initial trial of conservative management has become a common clinical practice. However, an important issue to define is what should be the ideal length of time of such approach since several reports have shown that NOM beyond 48 hours does not diminish the need for surgery, but may even increases surgical morbidity. In

addition, Schraufnagel and coll.⁴⁷ found an increased incidence of death and prolonged length of stay if surgery is delayed for more than 5 days.

According to the best common evidenced-based practice guidelines, the OBOW (Obstructive-Bowel) SICUT Collaborative Study Group considered safe a period of expectant management up to 3 days. A limited consensus has reached as regard to extent the period of NOM up to 6 days in selected high-risk patients.

Another fundamental principle of the clinical management of patients presenting small bowel obstruction is the oral water-soluble contrast medium X-Ray (Gastrografin swallow) that could be given with both diagnostic and therapeutic purposes. Gastrografin may be administered either orally or *via* the naso-gastric tube both immediately at admission and after an initial attempt of conservative treatment within the first 48 hours. A recent meta-analysis conducted on 14 randomized trials on patients with a diagnosis of SBO, concluded that Gastrografin swallow is effective in predicting the need for surgery in patients with adhesive occlusions. In addition, it reduces the overall need of surgery and shorten the hospital stay³⁰.

In the setting of an "acute abdomen" dictating for emergency surgery, laparotomy is the standard surgical approach to treat adhesive SBO. Nowadays, laparoscopic surgery is emerging as a viable alternative also in emergency surgery and laparoscopic adhesiolysis has been increasingly adopted. However, the safety of laparoscopy in the treatment of adhesive small bowel obstruction is still under debate because of randomized controlled trials comparing open with laparoscopic approach are scant. Recent systematic reviews and a multicenter prospective trial stated that laparoscopic surgery improves clinical outcomes and can be performed safely but it is recommended by experienced laparoscopic surgeons in selected patients^{39,44,46,53}.

The majority of LBOs are due to neoplasms, most often colon cancer, which accounts for just over 50% of LBO. Acute large bowel obstruction is the initial presentation in 7% to 29% of patients with colorectal cancer and still represents one of the most common causes of colonic emergency surgery⁶⁰. The most frequent location for obstructing colorectal cancer is the sigmoid colon, and 75% of tumors are located distal to the splenic flexure. Emergency presentation of colorectal cancer is more common in advanced stages of the disease, and frequently occurs in elderly patients, with significant associated comorbidities. The World Society of Emergency Surgery conducted in 2010 a systematic literature review for the evidences regarding the surgical based management of LBO due to left colon cancer, highlighting also that literature in this field is relative poor and lacking of powered randomized controlled trials⁵⁶.

According to their results, a Hartmann's procedure should be preferred to loop colostomy (Grade 2B) and it should be the procedure of choice in patients with high surgi-

cal risk (Grade 2C) or in case of high risk of anastomotic dehiscence. Subtotal and total colectomy should be attempted when cecal perforation or in case of synchronous colonic neoplasm, since total colectomy is associated with higher rates of impaired bowel function (Grade 1A). On this basis, primary resection and anastomosis with manual decompression seems the procedure of choice.

Nevertheless, in many cases, endoscopy may be useful for either establish a diagnosis and provide therapeutic options. Indeed, endoscopy can be used for bowel decompression, dilation of strictures or placement of self-expandable metal stents either to restore the luminal flow as a final treatment or to allow for a delay until elective surgical therapy (bridge to surgery).

According to the review provided by the World Society of Emergency Surgery, colonic stents could represent the best option when skills are available. Stents as a bridge to surgery seemed associated with lower mortality rate, shorter hospital stay, and a lower colostomy formation rate (Grade 1B).

However, such promising results were not subsequently confirmed and controversies exist. A multicenter randomized trial comparing colonic stenting versus emergency surgery for acute left-sided malignant colonic obstruction found that colonic stenting has no decisive clinical advantages to emergency surgery⁷⁵. Tan and coll.⁷² performed a systematic review and meta-analysis of randomized clinical trials of self-expanding metallic stents (SEMS) as a bridge to surgery versus emergency surgery. Technical and clinical success rates for stenting were lower than expected. Moreover, although SEMS has higher successful primary anastomosis and lower overall stoma rates, with no significant difference in complications or mortality, SEMS is associated with a high incidence of clinical and silent perforation. In 2014 Frago and co-workers⁶³ conducted a systematic review covering the current management of acute malignant large bowel obstruction. They concluded that in view of the various alternatives and the lack of high-grade evidence, the treatment of distal colonic obstruction should be individually tailored to each patient.

Stent placement has been more recently further discussed by the European Society of Gastrointestinal Endoscopy (ESGE)⁷⁶, who recommends that diagnostic evaluation of patients should always include a contrast-enhanced CT scan.

ESGE concludes that a prophylactic placement is not recommended, but should be reserved for those patients presenting symptoms and CT evidences of malignant large-bowel obstruction, without signs of perforation; on the same extent self-expandable metal stent as a bridge to surgery is not recommended as a standard treatment of occlusion due to left-sided colon cancers. For potentially curable patients a stent may be considered as an alternative to emergency surgery only in those with increased risks (e.g. ASA 3 and/or age 70 years or more).

Finally, according to the ESGE, a self-expandable metal stent should be considered the palliation of choice in malignant colonic occlusion with the exception of those treated with biologic antiangiogenic drugs.

Conclusions

This manuscript reports the consensus agreement of a panel of Italian surgical experts - on the behalf of the Società Italiana di Chirurgia d'Urgenza e di Trauma (SICUT Society) - covering the clinical and surgical management of patients presenting with SBO, LBO and pseudo-obstruction.

Finally, it is important to remark that although this consensus is in line with current international strategies and previous published guidelines, the current study summarizes the agreement of a large panel of experts and was developed adhering to common clinical practices by using a well-known and widely recognized methodology. Our findings could be useful tools in the safe basic daily management of these common and peculiar diseases; moreover further studies are ongoing in a larger panel of experts including radiologists and GI endoscopists for establishing the exact timing of CT scan in SBO and the long-term cost-effective appropriateness of colonic stenting.

Appendix 1

List of OBOW SICUT Collaborative Group

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Riassunto

PREMESSA: Le ostruzioni e pseudo-ostruzioni del piccolo/grande intestino sono condizioni frequenti, ma la loro gestione risulta spesso difficile per cui è necessario avere un adeguato e condiviso percorso gestionale. A tal proposito la Società Italiana di Chirurgia d'Urgenza e del Trauma (SICUT) ha disegnato uno studio volto a definire il management ottimale dei pazienti con occlusione intestinale.

METODI: Lo studio è stato condotto utilizzando la metodologia Delphi coinvolgendo un panel di 47 chirurghi italiani con maturata esperienza clinica. Il consenso è stato definito come un accordo uguale o superiore al 75.0%. Lo studio si è focalizzato su quattro aree tematiche comprendenti la nosologia, la diagnosi, la gestione e il trattamento delle ostruzioni e delle pseudo-ostruzioni intestinali.

Un occlusione intestinale è stata definita come un ostacolo alla progressione del contenuto intestinale.

RISULTATI: in genere ad esordio improvviso. Il panel ha identificato quattro principali criteri di diagnosi, tra i quali l'assenza di canalizzazione ai gas, la presenza di livelli ileali > 3.5 cm o di una dilatazione del colon > 6 cm nonché di una distensione addominale. Viene inoltre consigliato il ricovero in chirurgia, un approccio multidisciplinare e un transito con Gastrografin per tutti i pazienti che presentano un'occlusione. Tra i criteri per un intervento chirurgico immediato sono inclusi: la presenza di un'ernia strozzata, una dilatazione del cieco > 10 cm, segni di ostruzione del peduncolo vascolare e la persistenza di acidosi metabolica. La gestione non operatoria dei pazienti (la cui durata massima dovrebbe essere

di 72 ore) include il posizionamento di un sondino nasogastrico e la necessità di effettuare controlli clinici e laboratoristici ogni 12 ore. Il trattamento non operatorio deve essere sospeso in caso insorga il sospetto di complicanze intra-addominali, compaia un alto livello di lattati, una leucocitosi (> 18.000 / mm³ o neutrofili > 85%) o un raddoppiamento del livello di creatinina rispetto ai valori basali al ricovero. Al contrario il panel non ha raggiunto alcun consenso riguardo l'esatta tempistica della TAC e l'opportunità di stenting del colon come intervento palliativo in attesa di chirurgia definitiva.

CONCLUSIONI: Le raccomandazioni stabilite sono in linea con le strategie e le linee guida internazionali, e potrebbero essere uno strumento utile per la gestione del paziente affetto da occlusione intestinale.

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