ADDOME APERTO: TECNICA, DEVICE ED EVOLUZIONE DEL PENSIERO

Dott. Maurizio Castriconi
Dir.UOC Chirurgia d'Urgenza
AORN Cardarelli Napoli

DAMAGE CONTROL STRATGY

is the classic approach to managing severe trauma and is defined as an “abbreviated” laparotomy, intensive care unit (ICU) management, and planned reoperation for definitive repair (laparotomy, washout, resection of diseases segment, temporary abdominal closure, stabilization in ICU, reoperation with either end colostomy or anastomosis)

PERITONITE DIFFUSA DA PERFORAZIONE

PATOLOGIE ISCHEMICHE INTESTINALI

PANCREATITI

I pz critici (sepsi e shock settico) presentano condizioni cliniche caratterizzate da ipotensione (ipoperfusione), depressione miocardica, coagulopatia: più a rischio se sottoposti ad interventi complessi immediati

La DCS non è solo una strategia ma una nuova filosofia

OPEN ABDOMEN

L'addome deve essere tenuto aperto se:

- *persistono i requisiti per la rianimazione continua e/o la* ***fonte di contaminazione****,*
- *se è necessaria un'****anastomosi intestinale differita****,*
- *se è necessario un second look pianificato per* ***l'intestino ischemico***
- *se ci sono preoccupazioni per lo sviluppo della* ***sindrome del compartimento*** *addominale*

Coccolini *et al. World Journal of Emergency Surgery* (2023

IAH grade	IAP [mmHg]
Grade I	12 - 15
Grade II	16 - 20
Grade III	21 - 25
Grade IV	> 25
ACS	> 20 with new organ disfunction/failure

Napoli SURGERY

CENNI STORICI

Vacuum Pack Technique of Temporary Abdominal Closure: A 7-Year Experience with 112 Patients

Donald E. Barker, MD, Henry J. Kaufman, MD, Lisa A. Smith, MD, David L. Ciraulo, DO, MPH, Charles L. Richart, MD, and R. Phillip Burns, MD

1897 — McCosh

Prima descrizione di Open Abdomen in una peritonite settica

1940 — Ogilvie

Applicazione di doppio strato di garze fissate in Open Abdomen per le ferite di guerra

1970 — Maitland

Utilizzo di drenaggi a suzione

1993 — Fleischmann

Descrizione dell'utilizzo di pressioni negative nelle ferite infette

1995 — Argenta e Morykwas

Commercializzazione della V.A.C. Therapy

1997 — Argenta e Morykwas

Standardizzazione delle modalità di utilizzo intermittente

INDICAZIONI OPEN ABDOMEN

- Non esistevano dati definitivi su epidemiologia e outcome dell' **Open Abdomen (OA)**

2015

- **WSES** and the **PTS** promuovono il Registro Internazionale dell' Open Abdomen (**IROA**)

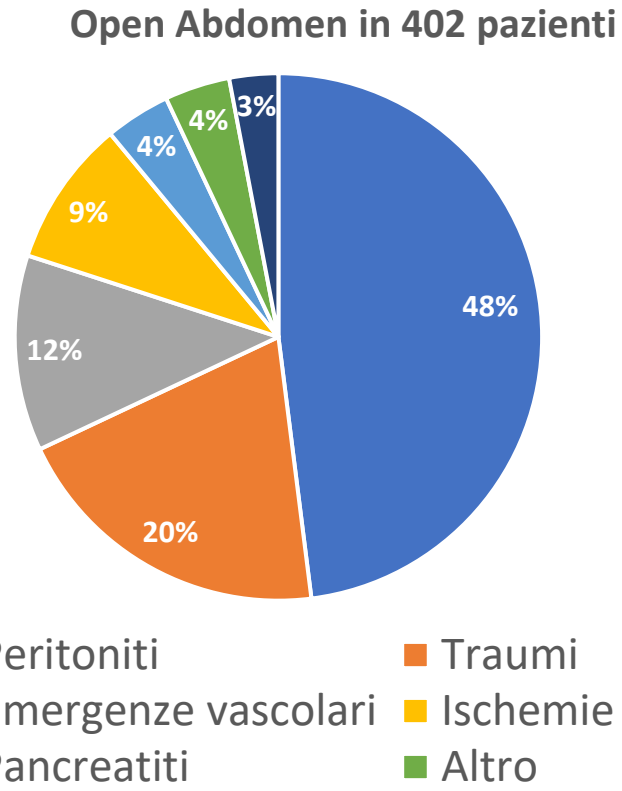
2017

- Nelle **peritoniti** i dispositivi di NPWT sembrano migliorare gli outcome


RESEARCH ARTICLE Open Access

IROA: International Register of Open Abdomen, preliminary results

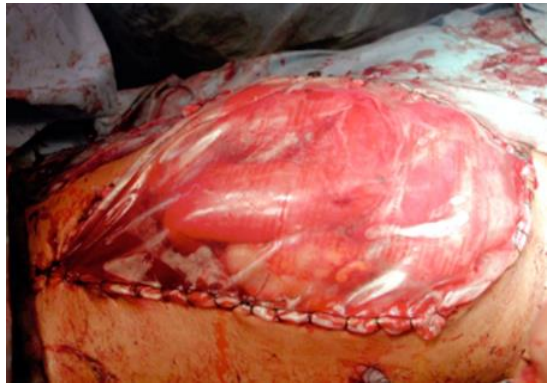
Federico Coccolini[1*], Giulia Montori[1], Marco Ceresoli[1], Fausto Catena[2], Rao Ivatury[3], Michael Sugrue[4],



ADDOME APERTO
evoluzione

- La Fascia della parete addominale rimane aperta;
- La copertura del contenuto addominale può essere realizzata con le seguenti tecniche:

Bogotà bag

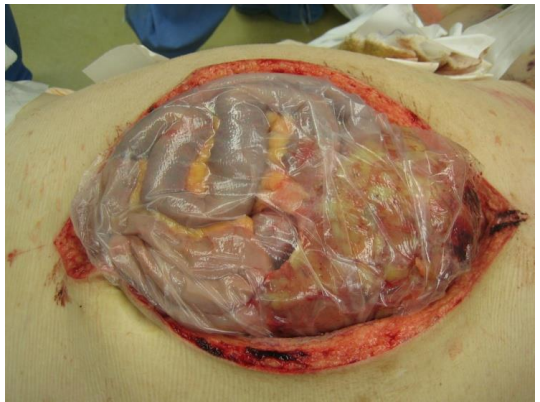


zip

Con reti

Sintesi della cute con filo o pinze

•Sistema vacuum

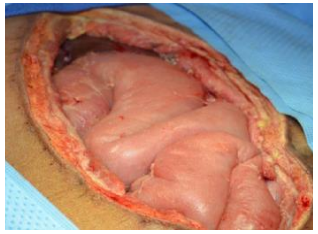


Classificazione Open Abdomen Björk 2009

1A	Clean OA without adherences between bowel and abdominal wall or fixity (lateralization of the abdominal wall)
1B	Contaminated OA without adherence/fixity
2A	Clean OA developing adherence/fixity
2B	Contanimated OA developing adherence/fixity
3	OA complicated by fistula formation
4	Frozen OA with adherent/fixed bowel, unable to close surgically, woth or without fistula

Classificazione Open Abdomen Björk 2016

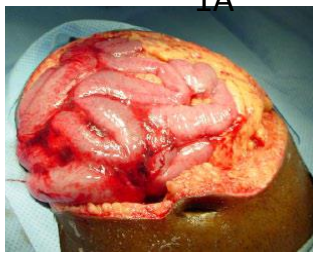
1A	Clean, no fixation
1B 1C	Contaminated, no fixation Enteric leak, no fixation
2A	Clean, developing fixation
2B 2C	Contaminated, developing fixation enteric leak, developing fixation
3A 3B	Clean, frozen abdomen contaminated, frozen abdomen
4	Established enteroatmospheric fistula, frozen abdomen



1A

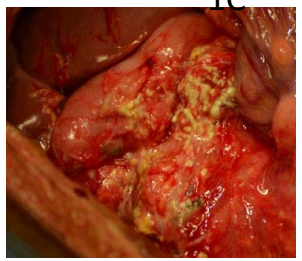
1B

1C



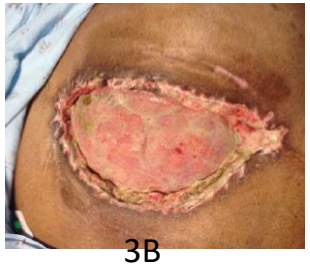
2A

2B

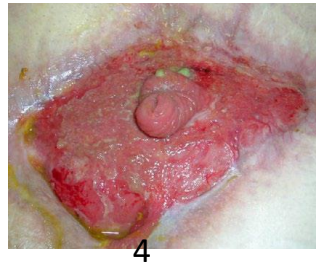


2C

3A



3B



4

DAMAGE CONTROL STRATGY (DCS): QUANDO FARLA?

International Journal of Colorectal Disease (2021) 36:867–879
https://doi.org/10.1007/s00384-020-03784-8

REVIEW

The role of damage control surgery in the treatment of perforated colonic diverticulitis: a systematic review and meta-analysis

Roberto Cirocchi[1] · Georgi Popivanov[2] · Marina Konaktchieva[3] · Sonia Chipeva[4] · Guglielmo Tellan[5] · Andrea Mingoli[6] · Mauro Zago[7] · Massimo Chiarugi[8] · Gian Andrea Binda[9] · Reinhold Kafka[10] · Gabriele Anania[11] · Annibale Donini[1] · Riccardo Nascimbeni[12] · Mohammed Edilbe[13] · Sorena Afshar[13]

The 2016 World Society of Emergency Surgery (WSES) conference paper stated that **"Damage control surgery strategy may be suggested for clinically unstable patients with diverticular peritonitis (severe sepsis/septic shock)"**

DCS is suggested only by Sartelli et al. in the World Society of Emergency Surgery guidelines for critical patients to **"enhance sepsis control and improve the rate of anastomosis"**

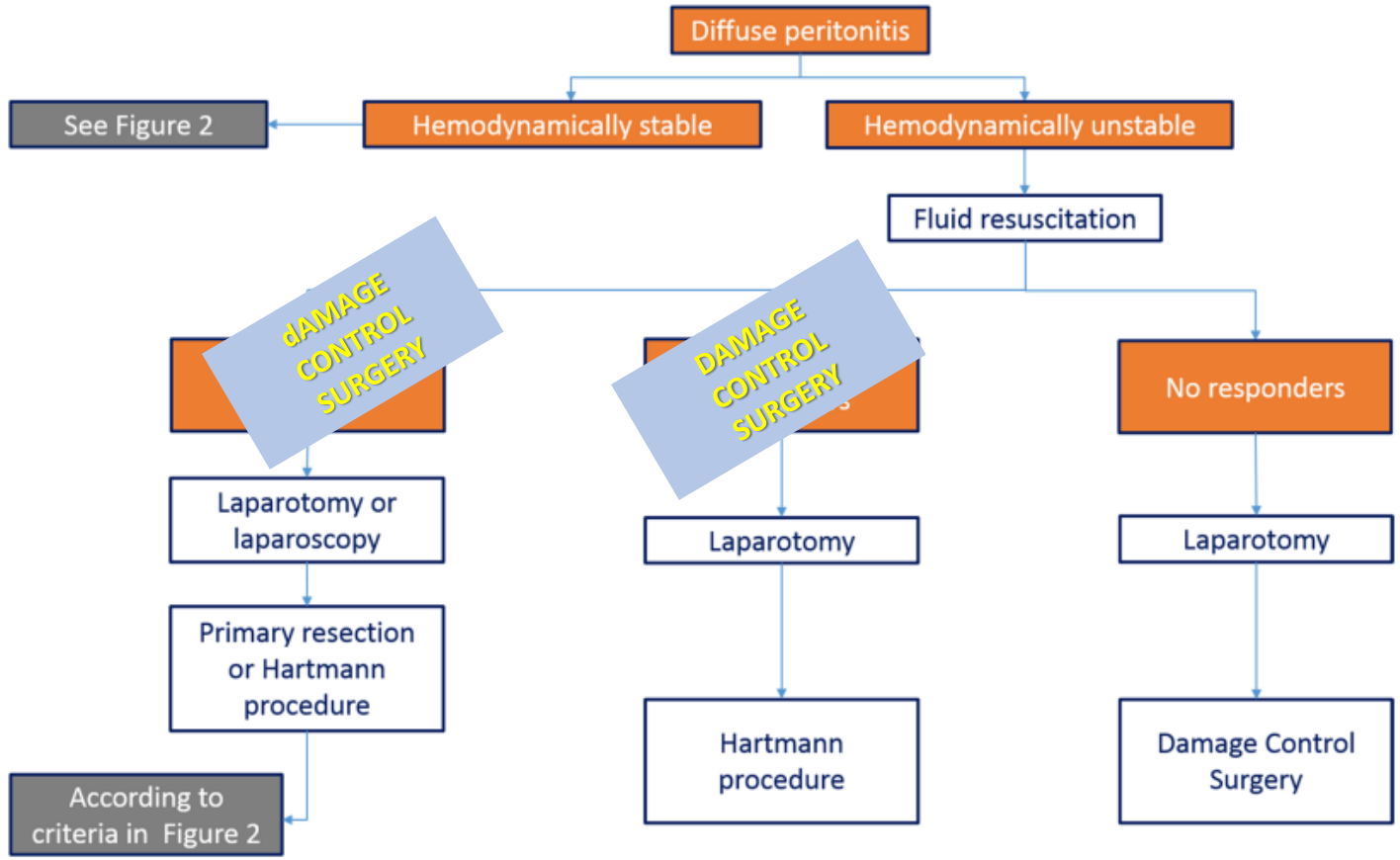


Fig. 3 Treatment algorithm for hemodinamically unstable patients

DAMAGE CONTROL STRATGY (DCS): COME FARLA

- **FASE 1**
  - lavage, limited resection with blind colonic ends
- **FASE 2**
  - resuscitation in ICU
- **FASE 3**
  - reoperation after 24–48 h

OPEN ABDOMEN ASSOCIATO AD NPWT

DAMAGE CONTROL STRATGY (DCS): COME FARLA

IL PAZIENTE STABILIZZATO RIMANE

CON ADDOME APERTO

IN REPARTO

Nello step 2

SOURCE CONTROL

Coccolini *et al.*
World Journal of Emergency Surgery (2023) 18:41
https://doi.org/10.1186/s13017-023-00509-4

World Journal of Emergency Surgery

REVIEW Open Access

Source control in emergency general surgery: WSES, GAIS, SIS-E, SIS-A guidelines

Federico Coccolini[1*], Massimo Sartelli[2], Robert Sawyer[3], Kemal Rasa[4], Bruno Viaggi[5], Fikri Abu-Zidan[6], Kjetil Soreide[7], Timothy Hardcastle[8], Deepak Gupta[9], Cino Bendinelli[10], Marco Ceresoli[11], Vishal G. Shelat[12], Richard ten Broek[13], Gian Luca Baiocchi[14], Ernest E. Moore[15], Ibrahima Sall[16], Mauro Podda[17], Luigi Bonavina[18], Igor A. Kryvoruchko[19], Philip Stahel[20], Kenji Inaba[21], Philippe Montravers[22], Boris Sakakushev[23], Gabriele Sganga[24], Paolo Ballestracci[1], Manu L. N. G. Malbrain[25], Jean-Louis Vincent[26], Manos Pikoulis[27], Solomon Gurmu Beka[28], Krstina Doklestic[29], Massimo Chiarugi[1], Marco Falcone[30], Elena Bignami[31], Viktor Reva[32], Zaza Demetrashvili[33], Salomone Di Saverio[34], Matti Tolonen[35], Pradeep Navsaria[36], Miklosh Bala[37], Zsolt Balogh[38], Andrey Litvin[39], Andreas Hecker[40], Imtiaz Wani[41], Andreas Fette[42], Belinda De Simone[43], Rao Ivatury[44], Edoardo Picetti[45], Vladimir Khokha[46], Edward Tan[47], Chad Ball[48], Carlo Tascini[49], Yunfeng Cui[50], Raul Coimbra[51,52], Michael Kelly[53], Costanza Martino[54], Vanni Agnoletti[54], Marja A. Boermeester[55], Nicola De'Angelis[56], Mircea Chirica[57], Walt L. Biffl[58], Luca Ansaloni[59], Yoram Kluger[60], Fausto Catena[61] and Andrew W. Kirkpatrick[62]

Patient stratification	
Class A	Healthy patients with no or well-controlled comorbidities and no immunocompromise, where the infection is the main problem
Class B	Patient with major comorbidities and/or moderate immunocompromise but currently clinically stable, in whom the infection can rapidly worsen the prognosis
Class C	Patients with important comorbidities in advanced stages and/or severe immunocompromise, in which the infection worsens an already severe clinical condition

Small Bowel Perforation			
		Source control	
Patients	Surgery	Operative	Antibiotic therapy
Class A	Urgent	Bowel resection	Short course
Class B	Emergent/Urgent	Bowel resection	Short course
Class C	Emergent/Urgent	Bowel resection ± intestinal anastomosis	Yes
Critically ill	Emergent/Urgent	Damage control ± Physiology restoring therapies	Yes

Coccolini *et al. World Journal of Emergency Surgery* (2023

DIVERTICOLITTE ACUTA

Classificazioni

- Hinchey, 1978
- Sher, 1997
- WSES 2015

Table 1 Hinchey classification and modified Hinchey classification by Sher et al.

Hinchey classification [3]		Modified Hinchey classification by Sher et al. [5]	
I	Pericolic abscess or phlegmon	I	Pericolic abscess
II	Pelvic, intraabdominal, or retroperitoneal abscess	IIa	Distant abscess amendable to percutaneous drainage
		IIb	Complex abscess associated with fistula
		III	Generalized purulent peritonitis
		IV	Fecal peritonitis

Modified Hinchey classification		Accompanying CT findings
Stage 0	clinically mild diverticulitis	diverticula with or without wall thickening of the colon
Stage Ia	confined pericolic inflammation and phlegmonous inflammation	colonic wall thickening with inflammatory reaction in pericolic fatty tissue
Stage Ib	abscess formation (<5 cm) in the proximity of the primary inflammatory process	alterations as stage Ia + pericolic or mesocolic abscess formation
Stage II	intra-abdominal abscess, pelvic or retroperitoneal abscess, abscess distant from the primary inflammatory process	alteration as stage Ia + distant abscess formation (mostly pelvic or interloop abscesses)
Stage III	generalized purulent peritonitis	free air with local or generalized free fluid and possible thickening of the peritoneum
Stage IV	fecal peritonitis	similar findings to stage III

DAMAGE CONTROL STRATGY (DCS): COME FARLA

DIVERTICOLITE COMPLICATA

Metodi

Indipendentemente dalla presenza di sepsi e/o shock settico: laparotomia esplorativa, lavaggio, drenaggio, resezione colica sin, VAC therapy con irrigazione, second-look a 48 ore.

Criteri per esecuzione dell'anastomosi al second look

- Assenza di peritonite "in corso" durante il secondo intervento (assenza di essudato purulento o fecaloide in addome)
- Monconi intestinali ben vascolarizzati e non edematosi
- SOFA score < 2 (no sepsi)
- Lattati < 2mmol/L e non necessità di vasopressori (no shock settico)

DAMAGE CONTROL STRATGY (DCS): COME FARLA
La nostra esperienza

Metodi: VAC Veraflo Therapy (parametri utilizzati)

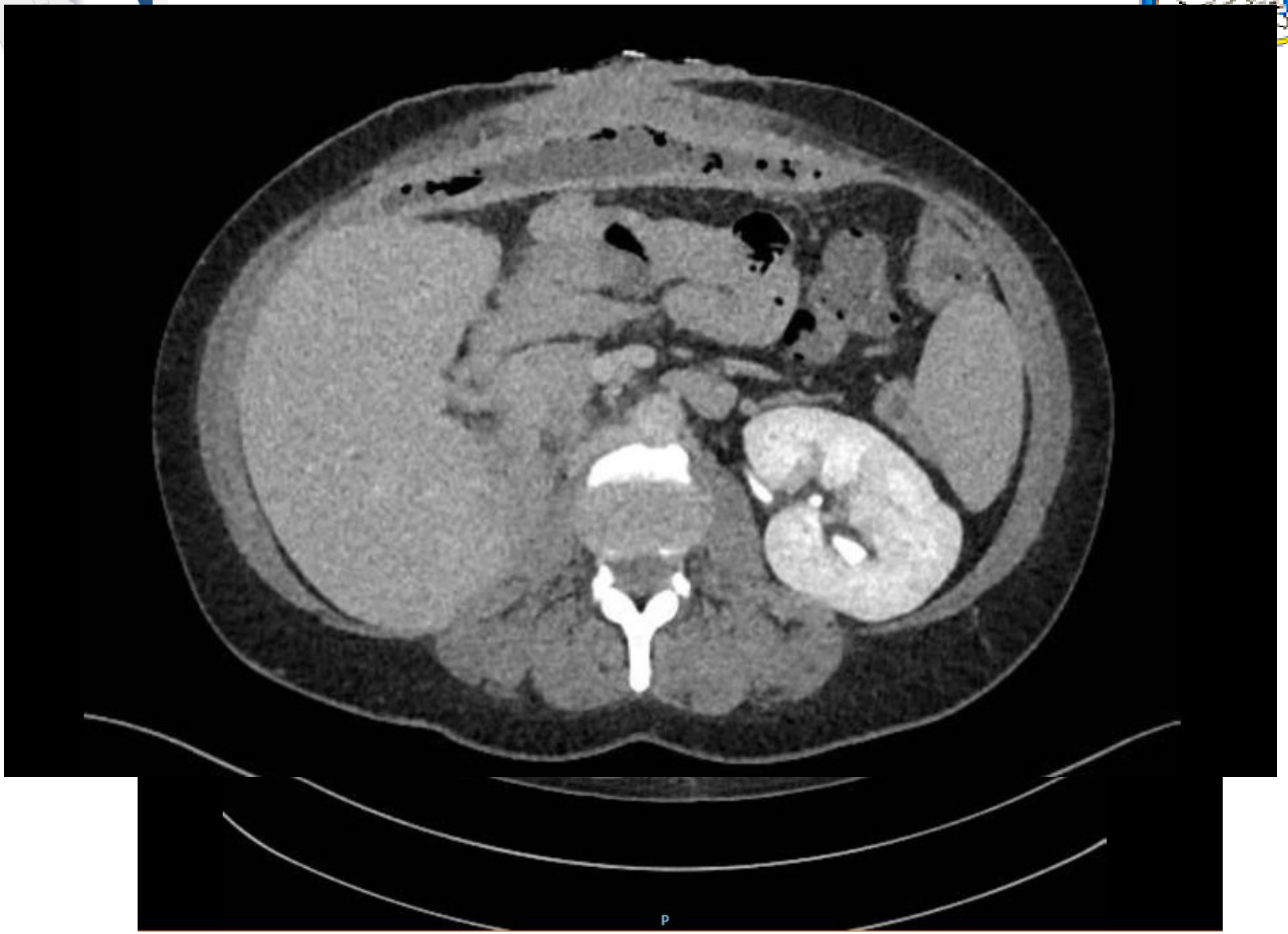
- Instillazione: 300 cc in 60 min (fisiologica / ringer lattato)
- Tempo di permanenza 15 min
- Tempo di aspirazione 2 ore
- Pressione negativa -125 mm/Hg

CASO CLINICO

DONNA
47aa
NEFRECTOMIA DESTRA PER PIELONEFRITE COMPLICATA
2021 PLASTICA DI LAPAROCELE CON RETE
LAPAROCELE COMPLICATO
ARRIVO AL CARDARELLI IN ELEZIONE

Napoli SURGERY

TC ADDOME
con mdc



CASO CLINICO

17 GEN 2023 LAPAROTOMIA EPLORATIVA, RIMOZIONE RETE PER SOSPETTA FISTOLA E NPWT
20 GEN 2023 RELAPAROTOMIA CHIUSURA ADDOME CON RIPOSIZIONAMENTO RETE (BIOLOGICA)
31 GEN 2023 (X GPO) REINTERVENTO PER MATERIALE BILIARE DAI DRENAGGI. ASPORTAZIONE PROTESI E NPWT
3 FEB 2023 REINTERENTO CON RISCONTRO DI MATERIALE BILIARE SU FROZEN ABDOMEN. NUOVAMENTE NPWT.
3 FEB 2023 REVISIONE CON OPEN ABDOMEN SENZA TROVARE FISTOLA BILIARE. TRASFRIMENTO NEL DEA.

INTERVENTO CHIRURGIA D'URGENZA 7 FEBBRAIO

- RIMOZIONE PARZIALE DI RETE INFETTA
- RISOLUZIONE DEL FROZEN ABDOMEN
- RESEZIONE ILEALE ED ANASTOMOSI ILEO-ILEALE
- CHIUSURA ADDOME

INTERVENTO CHIRURGIA D'URGENZA 9 FEBBRAIO

- RELAPAROTOMIA
- RISCONTRO PERFORAZIONE ILEALE A MONTE DELL'ANASTOMOSI
- SI ESTERIORIZZA ILEO PERFORATO
- NPWT CON ABTHERA

INTERVENTO CHIRURGIA D'URGENZA 14 FEBBRAIO

- RIMOZIONE ABTHERA
- ASSENZA DI PERFORAZIONI ILEALE
- CHIUSURA ADDOME

INTERVENTO CHIRURGIA D'URGENZA 22 FEBBRAIO

- RELAPAROTOMIA
- PERFORAZIONE ILEALE A VALLE DELL'ANASTOMOSI
- ILEOSTOMIA CON ANASTOMOSI
- CHIUSURA ADDOME

DIMISSIONE GIUGNO 2023

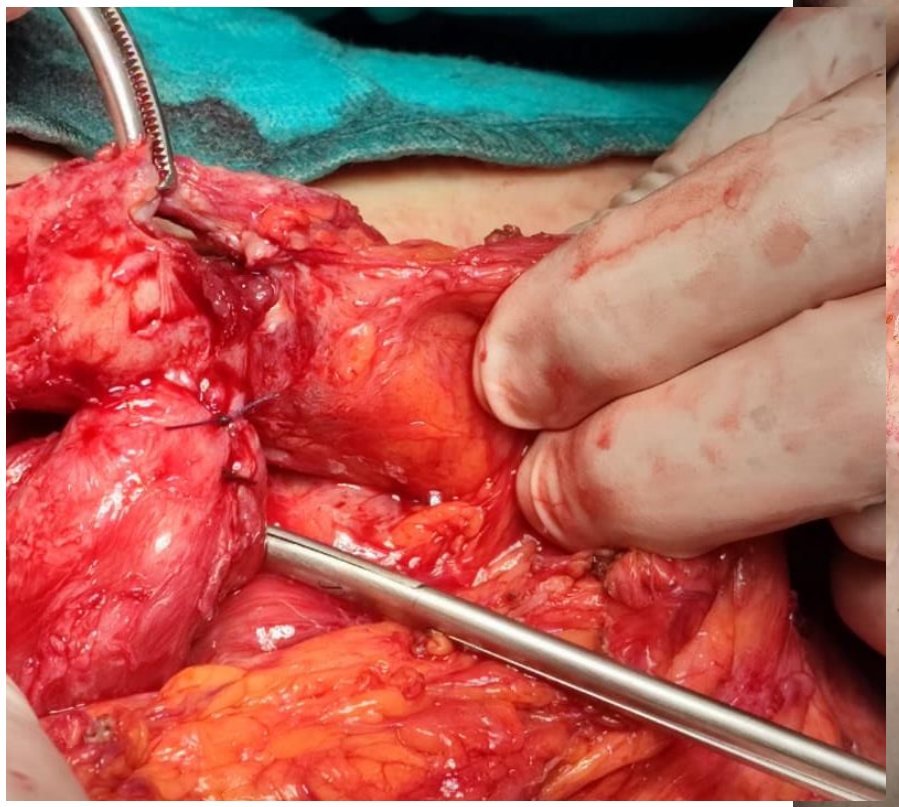
Napoli
SURGERY

Napoli
SURGERY

RITORNO AGOSTO 2023

INTERVENTO CHIRURGIA D'URGENZA 12 SETTEMBRE 2023

- RELAPAROTOMIA
- FROZEN ABDOMEN
- LISI ADERENZE
- RESEZIONE ANSA ILEALE FISTOLIZZATA A MONTE DELL'ILEOSTOMIA
- ANASTOMOSI ILEO-ILEALE T-L MECCANICA
- CHIUSURA CON VAC



INTERVENTO CHIRURGIA D'URGENZA 12 SETTEMBRE

- RELAPAROTOMIA
- FROZEN ABDOMEN
- LISI ADERENZE
- RESEZIONE ANSA ILEALE FISTOLIZZATA A MONTE DELL'ILEOSTOMIA
- ANASTOMOSI ILEO-ILEALE T-L MECCANICA
- CHIUSURA CON VAC

LA NOSTRA ESPERIENZA DELL'ISCHEMIA INTESTINALE

Updates Surg. 2022 Feb;74(1):337-342. doi: 10.1007/s13304-021-01192-3. Epub 2021 Oct 22.

Usefulness of damage control approach in patients with limited acute mesenteric ischemia: a prospective study of 85 patients

Antonio Brillantino [1], Michele Lanza [2], Massimo Antropoli [2], Alfonso Amendola [2], Simone Squillante [2], Vincenzo Bottino [3], Adolfo Renzi [4], Maurizio Castriconi [2]

Affiliations

To evaluate the efficacy of the damage control approach by two-step surgical procedure in not critical patients (without sepsis or septic shock) with peritonitis from limited acute mesenteric ischemia. From April 2013 to April 2020, 85 patients [49 (57.7%) women and 36 (42.3%) men, median age 69.5 (range 38-92)] were enrolled in this study and underwent emergency surgery. After resection of ischemic bowel, basing on the individual decision of the single surgeon, the patients underwent primary end-to-end anastomosis (Group 1) or damage control approach (Group 2) including primary laparotomy with resection of ischemic bowel, temporary abdominal closure and a second-look procedure at 48 h with re-evaluation of bowel vitality. Forty-seven (55.3%) patients underwent one-stage surgical treatment and 38 (44.7%) patients received a two-step procedure. In the latter group, at second exploration, 8 (21%) patients required a further intestinal resection, due to mesenteric ischemia progression. Both anastomosis dehiscence rate and need for ileostomy in Group 1 patients were significantly higher than in Group 2 (23.4% vs 5.3%: p = 0.03 and 19.1% vs 2.6%: p = 0.03; Fisher's exact test). No significative differences in mortality and morbidity rate were found between the two groups. The damage control approach by two-step surgical procedure may represent a valid innovative option in the management of not critical patients with limited acute mesenteric ischemia, achieving a better clinical outcome if compared with surgical treatment by one-step procedure.

Napoli SURGERY

General surgery and COVID-19: review of practical recommendations in the first pandemic phase

Vittorio Bresadola[1] · Carlo Biddau[1] · Alessandro Puggioni[1] · Alessandro Tel[2] · Massimo Robiony[2] · Jonathan Hodgkinson[4] · Cosimo Alex Leo[3,4]

Surgery in COVID-19 patients: operational directives

Federico Coccolini[1,20*], Gennaro Perrone[2], Massimo Chiarugi[1], Francesco Di Marzo[3], Luca Ansaloni[4], Ildo Scandroglio[5], Pierluigi Marini[6], Mauro Zago[7], Paolo De Paolis[8], Francesco Forfori[9], Ferdinando Agresta[10], Alessandro Puzziello[11], Domenico D'Ugo[12], Elena Bignami[13], Valentina Bellini[13], Pietro Vitali[14], Flavia Petrini[15], Barbara Pifferi[13], Francesco Corradi[9], Antonio Tarasconi[2], Vittoria Pattonieri[2], Elena Bonati[2], Luigi Tritapepe[16], Vanni Agnoletti[17], Davide Corbella[18], Massimo Sartelli[19] and Fausto Catena[2]

Impact of SARS-Cov-2 pandemic on Emergency General Surgery. A single-center observational study

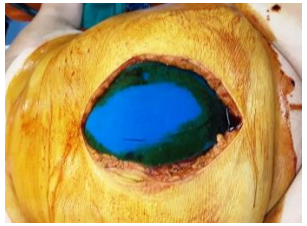
Alfonso Amendola, Giuseppe Palomba, Maria Gaudiello, Vincenza Paola Dinuzzi, Ester Marra, Ferdinando Fusco, Michele Lanza, Massimo Antropoli, Antonio Brillantino, Federica Mastella, Maurizio Castriconi

Emergency surgery during the COVID-19 pandemic: what you need to know for practice

B De Simone [1], E Chouillard [1], S Di Saverio [2], L Pagani [3], M Sartelli [4], W L Biffl [5], F Coccolini [6], A Pieri [3], M Khan [7], G Borzellino [8], F C Campanile [9], L Ansaloni [10], F Catena [11]

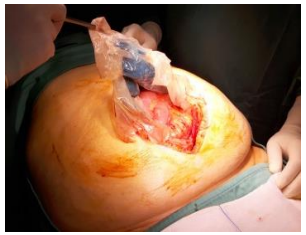
EMERGENZA COVID

LA NOSTRA ESPERIENZA CON LE IBD



Dicembre 2018 → Dicembre 2022

n 17 pz: 10 maschi (58,8%), 7 maschi (40%), età media 49 (22-59 aa)



- n 10 anastomosi (58,8%)
- n 5 (17%) ilestomia diretta
- n 2 fistola anastomotica (ileostomia terminale)
- Tempo di degenza medio 17 gg (7-22)

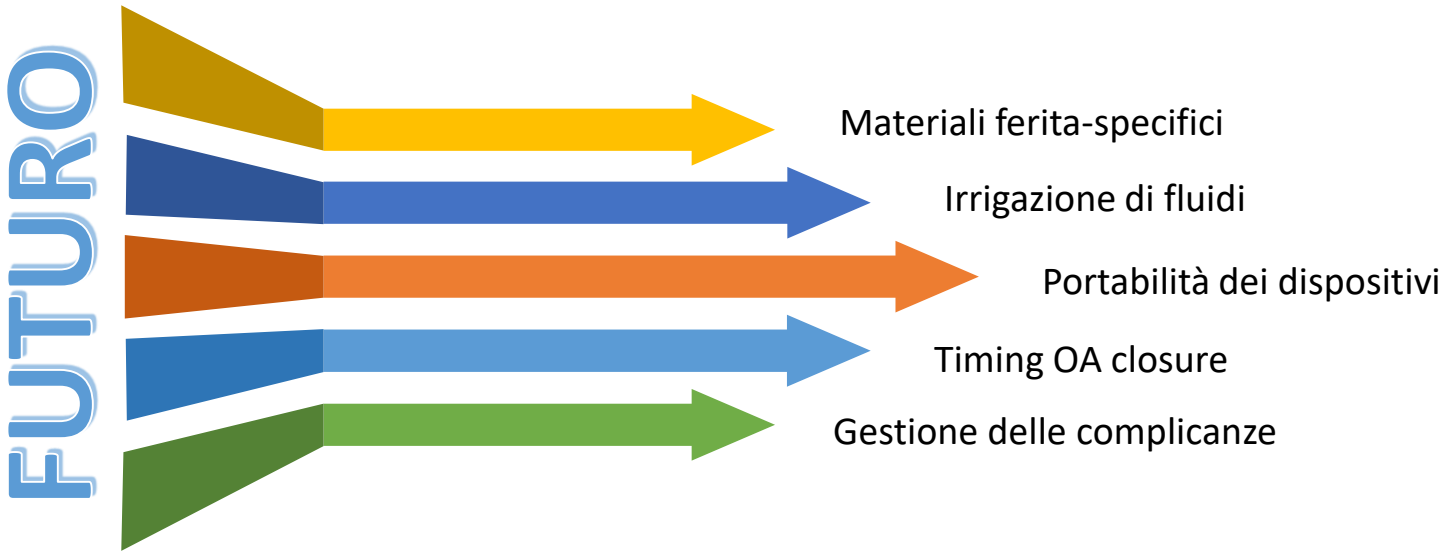
VAC Therapy – Veraflo© setting:
Instillazione: 300 cc in 1 min (fisiologica/ringer lattato)
Tempo di permanenza: 10 min
Tempo di aspirazione: 2 ore
Pressione applicata: -125 mm Hg

CONCLUSIONI E PROSPETTIVE FUTURE

DCS durante le emergenze

NPWT

Standardizzazione



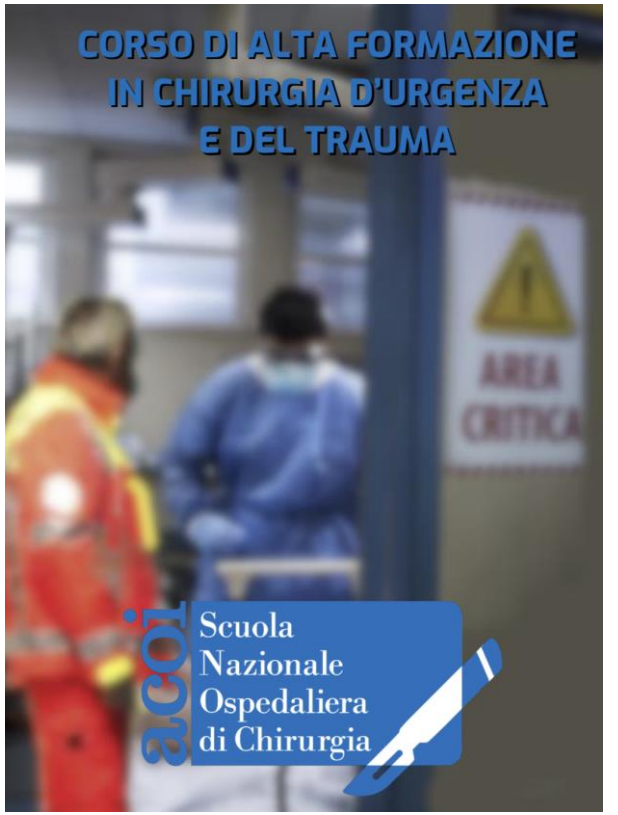
TO BE CONTINUED…

IN CORSO RACCOLTA **DATABASE** CON OLTRE 80 CASI DI OA PER ANNO

IN CORSO **SURVEY OA** CON SICUT

THE NCT04220840 IS AN ONGOING STUDY,
“THE DAMAGE CONTROL STRATEGY FOR THE TREATMENT OF PERFORATED DIVERTICULITIS OF THE SIGMOID COLON WITH DIFFUSE PERITONITIS. ”

SCUOLA ACOI CHIRURGIA D’URGENZA



Napoli
SURGERY

Grazie dell’attenzione