emergency repair of complicated abdominal wall hernias

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emergency repair of complicated abdominal wall hernias

- poor prognoses
- higher rate of post-operative complications
- up to 15-fold higher mortality, reoperation, and readmission rates than elective repair \( (p< 0.003) \)

emergency repair of complicated abdominal wall hernias

- early mortality rates unchanged at between 4% and 7%
- similar to figures reported for other procedures supposedly more severe, such as colonic resection with primary anastomosis

WSES guidelines for emergency repair of complicated abdominal wall hernias
groin hernias (femoral and inguinal)
ventral hernias (umbilical, epigastric, spigelian and incisional)
incarcerated hernia
strangulated hernia
(+/- intestinal obstruction)
Main topics

- Timing of intervention: when??
- Laparoscopic approach: how??
- Emergency hernia repair in different contamination of the surgical field: prosthetic repair?? Wich kind??
Main topics

- Timing of intervention: when??
- Laparoscopic approach: how??
- Emergency hernia repair in different contamination of the surgical field: prosthetic repair?? Wich kind??
main risk factors for morbidity and mortality in emergency hernia surgery

- age over 70 years
- associated bowel resection
- American Society of Anesthesiologists (ASA) class III/IV

Langenbeck’s Arch Surg
emergency repair of complicated abdominal wall hernias

- analysis of complications and causes of death can be useful in the design of treatment protocols for emergency surgery in abdominal wall hernias?
emergency repair of complicated abdominal wall hernias

Table 1 Details of the specific protocol to improve outcomes in patients with complicated abdominal hernia undergoing urgent repair

<table>
<thead>
<tr>
<th>Period</th>
<th>Objectives</th>
<th>Actions</th>
<th>Person in charge</th>
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<tbody>
<tr>
<td>Preoperative</td>
<td>Avoiding delay in diagnosis and treatment</td>
<td>Systematic examination of potential hernia orifices in all patients</td>
<td>Emergency doctors and nurses</td>
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<td></td>
<td>Prevention of respiratory complications</td>
<td>Early surgeon consultation in front of any incarcerated or non-</td>
<td>Surgeons on call</td>
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<td>Prevention of bowel resection</td>
<td>reductable bulge or hernia</td>
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<td>Refer to early scheduled surgery all patients with symptomatic hernia</td>
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<td>spontaneously solved</td>
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<td>Gastric emptying using a nasogastric tube in patients with bowel</td>
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<td>obstruction or radiological signs of gastric/bowel dilatation</td>
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<td>Anesthesia</td>
<td>Prevention of respiratory cardiac and wound</td>
<td>During anesthesia</td>
<td>Anesthesiologists</td>
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<td>and operation</td>
<td>complications</td>
<td>Airway protection to avoid aspiration</td>
<td>Surgeons</td>
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<td>Prevention of anesthetic-related complications</td>
<td>Administration of prophylactic antibiotics before surgery</td>
<td>Surgical nurses</td>
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<td>Local or regional anesthesia if feasible</td>
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<td>Restriction of peroperative fluid infusion regime (6–8 mL/h)</td>
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<td>Forced body heating (Bair Hugger™ system and warmed intravenous fluids)</td>
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<td>Treatment of coagulopathy if present</td>
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<td>At operation</td>
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<td>Systematic revision of hernia sac content</td>
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<td>Cleaning of surgical field before using prosthetic material</td>
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<td>Change of gloves before mesh manipulation</td>
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<td>Meticulous hemostasis</td>
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<td>Avoiding drains whenever if possible</td>
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<td>Keeping an adequate analgesia during all postoperative period</td>
<td>Surgeons</td>
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<td>Avoiding sedative and antiemetic agents especially in high risk patients</td>
<td>Nurses</td>
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<td>Removal of drains and tubes as soon as possible</td>
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<td>Keeping the head of the patient’s bed above 30–45°</td>
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<td>Early oral intake (4–6 h after operation) and discontinue fluid</td>
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<td>Soft mechanical diet and thickened liquids</td>
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<td>Early mobilization</td>
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<td>Respiratory physiotherapy in high risk patients (&gt;70 years, COPD and/</td>
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<td>or smoking patients)</td>
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<td>Monitoring of hydromolecular imbalance</td>
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<td>Use of low molecular weight heparin</td>
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Martínez-Serrano MA. Et al Specific improvement measures to reduce complications and mortality after urgent surgery in complicated abdominal wall hernia. Hernia 2012
emergency repair of complicated abdominal wall hernias

- results showed higher rates of mortality in patients:
  - with acute complication as their first hernia-related symptom
  - whose treatment was delayed for more than 24 hours
- the authors concluded that early detection of complicated abdominal hernias may be the best means of reducing the rate of mortality

Martínez-Serrano MA. Et al Specific improvement measures to reduce complications and mortality after urgent surgery in complicated abdominal wall hernia. Hernia 2012
Timing of intervention

Patients should undergo emergency hernia repair immediately when intestinal strangulation is suspected (grade 1C recommendation).
The problem is........

- early detection of progression from an incarcerated hernia to a strangulated hernia
Clinical signs

- the combination of four classic signs of strangulation - continuous abdominal pain, fever, tachycardia, and leukocytosis - **could not distinguish strangulated from simple obstructions**

- reported a low incidence of these classical findings and stated that their presence indicated an advanced stage of strangulation, which would be of **limited value for early diagnosis**

Clinical signs

- SIRS alongside abdominal muscle guarding was independently predictive of strangulated small bowel obstruction (multivariate analysis)

Tsumura H. Systemic inflammatory response syndrome (SIRS) as a predictor of strangulated small bowel obstruction. *Hepatogastroenterology* 2004
Diagnostic tests

- CPK, D-dimer, lactate level....
- Lactate level was the only laboratory parameter significantly associated with viability ($P < 0.01$, Mann-Whitney test)
- Other laboratory data did not show statistically significant associations
- The Authors concluded that arterial blood lactate level (2.0 mmol/L or greater) was a useful predictor of nonviable bowel strangulation

Tanaka K. et Al. Lactate levels in the detection of preoperative bowel strangulation. *Am Surg* 2012
Radiological techniques

- CT findings of reduced wall enhancement were the most significant independent predictor of bowel strangulation

Timing of intervention
Systemic inflammatory response syndrome (SIRS) signs, contrast-enhanced CT findings as well as lactate, CPK and D-dimer levels are predictive of bowel strangulation (grade 1C recommendation).
Main topics

- Timing of intervention: when??
- Laparoscopic approach: how??
- Emergency hernia repair in different contamination of the surgical field: prosthetic repair?? Which kind??
Laparoscopic approach

Deeba S et Al. Laparoscopic approach to incarcerated and strangulated inguinal hernias. *JSLS 2009*

Olmi S et Al. Emergency laparoscopic treatment of acute incarcerated incisional hernia. *Hernia 2009*

Shah RH et Al. Laparoscopic repair of incarcerated ventral abdominal wall hernias. *Hernia 2008*

Hernioscopy: a mixed laparoscopic-open surgical technique

Prospective randomized study

Impact of hernia sac laparoscopy on the morbidity and mortality in cases with a spontaneous reduction of the strangulated hernia content before the assessment of its viability seems to be an accurate and safe method allowing to prevent unnecessary laparotomy and especially in high-risk patients it contributes to decrease major morbidity.

Laparoscopic approach

Repair of incarcerated hernias – both ventral and groin – may be performed with a laparoscopic approach (grade 1C recommendation).
Main topics

- Timing of intervention: when??
- Laparoscopic approach: how??
- **Emergency hernia repair in different contamination of the surgical field: prosthetic repair??** Which kind??
Emergency hernia repair in “clean surgical field”

- patients with intestinal incarceration
- no signs of intestinal strangulation
- no concurrent bowel resection
Emergency hernia repair in “clean surgical field”

- Some smaller studies comparing mesh versus suture repair for this indication have been published, all denouncing mesh repair to be safe and effective.

Emergency hernia repair in “clean surgical field”

Prosthetic repair with synthetic mesh is recommended for patients with intestinal incarceration and no signs of intestinal strangulation or concurrent bowel resection (clean surgical field) (grade 1A recommendation)
Emergency hernia repair in “potentially contaminated surgical field”

- Intestinal strangulation and/or concurrent bowel resection
Emergency hernia repair in “potentially contaminated surgical field”

- Discrepancies data and conflicting reports
- Studies not focused on emergency repair
Emergency hernia repair in “potentially contaminated surgical field”

Choi JJ et Al. Use of mesh during ventral hernia repair in clean contaminated and contaminated cases: outcomes of 33,832 cases. *Ann Surg* 2012

Xourafas D. et Al. Impact of mesh use on morbidity following ventral hernia repair with a simultaneous bowel resection. *Arch Surg* 2010


Mandalà V. et Al. Some considerations on the use of heterologous prostheses in incisional hernias at risk of infection. *Hernia* 2000

Campanelli G. et Al. Prosthetic repair, intestinal resection, and potentially contaminated areas: safe and feasible? *Hernia* 2004
Emergency hernia repair in “potentially contaminated surgical field”


Bessa SS. Et Al. Results of prosthetic mesh repair in the emergency management of the acutely incarcerated and/or strangulated groin hernias: a 10-years study. *Hernia* 2015

Bessa SS. Et Al. Results of prosthetic mesh repair in the emergency management of the acutely incarcerated and/or strangulated ventral hernias: a seven years study. *Hernia* 2013
Emergency hernia repair in “potentially contaminated surgical field”

For patients with intestinal strangulation and/or concurrent bowel resection (potentially contaminated surgical field), direct suture is recommended when the hernia defect in question is small. Synthetic mesh repair may be performed, but with caution. (grade 2C recommendation)
Emergency hernia repair in “potentially contaminated surgical field”

For patients with intestinal strangulation and/or concurrent bowel resection (potentially contaminated surgical field), biological meshes may be a valid option but merit detailed cost-benefit analysis (grade 2C recommendation)
The battle between biological and synthetic meshes in ventral hernia repair
A. Montgomery
Hernia 2013
So who is the winner of this battle? So far the tussle is still going on. There is though insufficient level of high-quality evidence on the value of BMs for VHR so far. Until more data are available, the best current indication for biological meshes is probably the contaminated setting, on the condition that the bacterial load has been reduced as much as possible before implanting the mesh, preferably in the retromuscular positioning with a maximal attempt for fascia closure on top of the mesh.
Emergency hernia repair in “potentially contaminated surgical field”

- **Grade 1**: Low Risk
  - Low risk of complications
  - No history of wound infection

- **Grade 2**: Co-Morbid
  - Smoker
  - Obese
  - Diabetic
  - Immunosuppressed
  - COPD

- **Grade 3**: Potentially Contaminated
  - Previous wound infection
  - Stoma present
  - Violation of the gastrointestinal tract

- **Grade 4**: Infected
  - Infected mesh
  - Septic dehiscence

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Emergency hernia repair in “potentially contaminated surgical field”

**Conclusions:** the cumulative data regarding biologic mesh use in VHRs under contaminated conditions does not support the claim that it is better than synthetic mesh used under the same conditions.

Primus FE, Harris HW: A critical review of biologic mesh use in ventral hernia repairs under contaminated conditions. *Hernia 2013*
Conclusion: Currently, there is a very limited evidence for the use of biological and biosynthetic meshes in strangulated hernias in either open or laparo-endoscopic repair. Finally, there is an urgent need to start with randomized controlled comparative trials as well as to support registries with data to achieve more knowledge for tailored indication for the use of biological meshes.
Emergency hernia repair in “potentially contaminated surgical field”

Emergency hernia repair in “contaminated-dirty surgical field”

- patients with strangulated obstruction and peritonitis by bowel perforation (contaminated-dirty surgical field)
For stable patients with strangulated obstruction and peritonitis by bowel perforation (contaminated-dirty surgical field) direct tissue suture is recommended when the hernia defect is small; in the events that direct tissue suture is not possible, biological mesh repair may be suggested (grade 2C recommendation).
Emergency hernia repair in “contaminated-dirty surgical field”

the choice between a crosslinked or a non cross-linked biological mesh should be evaluated depending on the defect size and degree of contamination (grade 2C recommendation)
If biological mesh is not available, polyglactin mesh repair may be a viable alternative (grade 2C recommendation).
Emergency hernia repair in “contaminated-dirty surgical field”

- the use of absorbable prosthesis exposes the patient to an inevitable hernia recurrence
- these meshes, once implanted, initiate an inflammatory reaction that, through a hydrolytic reaction, removes and digests the implanted prosthetic material completely
- the high risk of hernia recurrence is explained by the complete dissolution of the prosthetic support
- enhances the likelihood of subsequent successful placement of a permanent mesh

Dayton MT. et Al. Use of an absorbable mesh to repair contaminated abdominal-wall defects. Arch Surg 1986
emergency repair of complicated abdominal wall hernias: take home message (1)

- Patients should undergo emergency hernia repair immediately when intestinal strangulation is suspected

- Repair of incarcerated hernias - both ventral and groin - may be performed with a laparoscopic approach
Emergency repair of complicated abdominal wall hernias: take home message (2)

- Prosthetic repair with synthetic mesh is recommended for patients with intestinal incarceration and no signs of intestinal strangulation or concurrent bowel resection.
emergency repair of complicated abdominal wall hernias: take home message (3)

- for patients with intestinal strangulation and/or concurrent bowel resection, direct suture is recommended when the hernia defect is small

- synthetic mesh repair may be performed, but with caution

- biological meshes may be a valid option but merit detailed cost-benefit analysis
emergency repair of complicated abdominal wall hernias: take home message (4)

- For stable patients with strangulated obstruction and peritonitis by bowel perforation direct tissue suture is recommended when the hernia defect is small.
- In the events that direct tissue suture is not possible, biological mesh repair may be suggested.
- The choice between a crosslinked or a non cross-linked biological mesh should be evaluated depending on the defect size and degree of contamination.
- If biological mesh is not available, polyglactin mesh repair may be a viable alternative.