GUIDELINES GROUP

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Umbilical and Epigastric Hernias

- Simple defects (<2cm)
- Simple outpatient surgery
Methodology

• SIGN, PICO

• Level of evidence: Meta-Analyses, RCTs, cohort studies

• Protocol, key questions, working groups, consensus meetings, recommendations
Consensus Meetings

Miami, March 2018

Amsterdam, October 2018

Malmö, February 2019
Problems

• Ventral hernias and incisional hernias combined

• Only case series for some key questions
Fig. 1 PRISMA flow chart showing selection of articles for review

Identification
- Records identified through database searching: $n=11,859$
- Additional records identified through other sources: $n=191$

Screening
- Records screened after removal of duplicates: $n=8310$

Eligibility
- Full-text articles assessed for eligibility: $n=470$

Included
- Full-text articles excluded: $n=356$
- Studies included in guidelines: $n=114$
Definition and diagnosis

KQ 1: What is the definition of an umbilical hernia and an epigastric hernia?

Statement: There is no available classification that classifies sizes of umbilical and epigastric hernias satisfactorily. An umbilical hernia is defined as a primary hernia with the defect located in the midline in the centre of the umbilical ring. An epigastric hernia is defined as a hernia with the centre of the defect in the midline above the umbilicus up to the xiphoid process. The guideline group classified umbilical and epigastric hernias into small (0–1 cm), medium (more than 1 cm up to 4 cm) and large (over 4 cm) based on defect diameter.

Recommendation: It is suggested that a new consensus on definition and size classification of umbilical and epigastric hernias is created.

Quality of evidence: ⭐⭐⭐⭐

Strength of recommendation: Weak
KQ 2: Are diagnostic modalities indicated in the management of umbilical and epigastric hernias?

**Statement:** Studies specifically designed to evaluate diagnostic modalities for primary ventral hernias are lacking. Umbilical and epigastric hernias are typically diagnosed by clinical examination only. Imaging by ultrasound or computed tomography can be considered in case clinical examination is inconclusive.

**Recommendation:** It is recommended to diagnose umbilical or epigastric hernias by clinical examination alone. Imaging by ultrasound or computed tomography can be considered in case of doubt.

**Quality of evidence:** ☒ ☐ ☐ ☐ ☐  
**Strength of recommendation:** strong (upgraded)
KQ 3: Is a watchful waiting strategy safe in patients with asymptomatic umbilical or epigastric hernias?

Statement: There are limited data on watchful waiting for patients with umbilical and epigastric hernias, but a watchful waiting strategy seems safe.

Recommendation: For asymptomatic umbilical and epigastric hernias, a watchful waiting strategy can be suggested.

Quality of evidence: ★★★★

Strength of recommendation: Weak
KQ 4: Is optimization of the patient necessary prior to elective umbilical or epigastric hernia repair?

**Statement:** Wound complications are the most common complication in ventral hernia repair. Smoking and obesity increase the risk of postoperative wound complications in general, but data are limited considering umbilical and epigastric hernia repair specifically. From other types of surgery, it is known that 4 weeks of smoking cessation prior to surgery and weight loss for obese patients reduce the risk of surgical site infection.

**Recommendation:** It is suggested to advise 4-6 weeks smoking cessation and weight loss to BMI < 35 kg/m² prior to elective umbilical or epigastric hernia repair.

**Quality of evidence:** ☓ ☓ ☓ ☓  
**Strength of recommendation:** weak
KQ 5: Is antibiotic prophylaxis indicated for umbilical and epigastric hernia repair?

**Statement:** There is insufficient evidence to recommend routine use of antibiotic prophylaxis in umbilical and epigastric hernia repair to decrease the rate of surgical site infection. However, surgical site infection is a significant complication of umbilical and epigastric hernia repair and may be associated with mesh infection, therefore antibiotic prophylaxis may be useful.

**Recommendation:** A prophylactic regimen of second-generation cephalosporin given as a single dose perioperatively is suggested when using a mesh for umbilical or epigastric hernia repair.

**Quality of evidence:** ✗☐☐☐  
**Strength of recommendation:** weak
KQ 6: Is there a place for sutured repair in elective umbilical or epigastric hernia repair?

**Statement:** The use of mesh for open umbilical or epigastric hernia repair reduces the rate of recurrence without increasing the rate of surgical site infection or postoperative pain. The quality of evidence is limited for hernias with defect sizes of <1 cm.

**Recommendation:** It is recommended to use mesh for repair of umbilical and epigastric hernias to reduce the recurrence rate. Sutured repair can be considered in shared decision making and in small hernia defects <1 cm.

**Quality of evidence:** ★★★★★

**Strength of recommendation:** Strong
KQ 7: Which is the preferred technique for sutured repair of umbilical or epigastric hernias?

**Statement:** There is insufficient evidence to recommend the use of a specific type of suture or suturing technique for sutured repair of umbilical or epigastric hernias. Studies indicated that most often slowly resorbable or non-absorbable sutures were used.

**Recommendation:** It is suggested to use slowly resorbable or non-absorbable sutures for sutured repair of umbilical and epigastric hernias. The suture technique can be chosen by the surgeon. It is recommended not to use quickly absorbable sutures.

**Quality of evidence:** ☒ ☒ ☒ ☒

**Strength of recommendation:** Weak
KQ 8: Which is the optimal surgical approach for an acutely strangulated/incarcerated umbilical or epigastric hernia?

Statement: Emergency hernia repairs are heterogeneous. Many patient-related factors play a role for potential morbidity and mortality. There is low-level evidence to suggest that the use of non-resorbable mesh in a strangulated/incarcerated umbilical or epigastric hernia is safe. It may be considered in patients with a clean or clean-contaminated surgical field.

Recommendation: It is suggested to tailor the emergency repair of umbilical or epigastric hernias based on patient and hernia characteristics. The use of mesh for extra-peritoneal placement can be considered.

Quality of evidence: ☒☐☐☐ ☑ Strength of recommendation: weak
KQ 9: Which is the preferred type of mesh and the preferred layer for mesh placement when doing an open umbilical or epigastric hernia repair?

**Statement:** The use of intraperitoneal patches for umbilical or epigastric hernia repairs may shorten surgical time but may be associated with increased complication rates compared with a flat mesh placed in the preperitoneal space. Patches or pre-shaped prosthetics with anti-adhesive barriers are more expensive than a synthetic flat mesh. Acceptable evidence finds that placement of the mesh in the retromuscular or preperitoneal position is associated with a lower rate of surgical site infection and recurrence. Placement of the mesh in the preperitoneal space seems safe and feasible.

**Recommendation:** It is suggested to use a flat permanent mesh placed in the preperitoneal space for open umbilical or epigastric hernia repair.

**Quality of evidence:** ★★★★★

**Strength of recommendation:** Weak
KQ 10: Which is the preferred mesh overlap for open umbilical or epigastric hernia repair?

Statement: There is not enough evidence to recommend a specific mesh overlap that may reduce recurrence after umbilical and epigastric hernia repair. A preperitoneal mesh with an overlap of 3 cm has been associated with low recurrence rates in umbilical hernia repairs with defects of 1–4 cm.

Recommendation: In preperitoneal mesh repair for open umbilical and epigastric hernia repair, an overlap of 3 cm is suggested for defects of 1–4 cm.

Quality of evidence: ★★★★
Strength of recommendation: Weak
KQ 11: Which is the preferred method of mesh fixation for open umbilical or epigastric hernia repair?

Statement: There is not enough evidence to recommend any method of fixation over the other, where to fixate the mesh or whether mesh fixation is necessary in open umbilical or epigastric hernia repair. Most studies described suture fixation with non-absorbable sutures.

Recommendation: If the mesh is fixated, it is suggested to use a non-absorbable suture.

Quality of evidence: ☒☐☐☐☐ Strength of recommendation: Weak
KQ 12: Should the defect be closed for open umbilical and epigastric hernia repairs when using a mesh?

Statement: There is not enough evidence to recommend whether the defect should be left open or closed in open primary ventral hernia repair. Studies using a flat mesh have reported closing of the defect.

Recommendation: It is suggested to close the defect for open umbilical or epigastric hernia repair when using a flat mesh.

Quality of evidence: ☒☐☐☐ ☑

Strength of recommendation: Weak
KQ 13: Which is the preferred anaesthetic modality for open umbilical and epigastric hernia repair?

Statement: Available evidence shows that local anesthesia can be safely used for open umbilical and epigastric hernias. There is no evidence to support the superiority of local anaesthesia to general anaesthesia.

Recommendation: The guideline group suggests adhering to local protocols, and that patient, surgeon and anaesthesiologist agree on the type of anaesthesia based on shared decision making for open umbilical or epigastric hernia repair.

Quality of evidence: ☒☐☐☐ Strength of recommendation: Weak
KQ 14: What are the indications for laparoscopic umbilical and epigastric hernia repair?

Statement: Laparoscopic repair decreases the risk of wound complications. It may be beneficial in large (>4 cm) umbilical or epigastric hernias. In small or medium-sized hernias, laparoscopic repair may be considered in patients at high risk of wound infection.

Recommendation: It is suggested to consider laparoscopic repair in large umbilical or epigastric hernias, or if the patient has an increased risk of wound infection.

Quality of evidence: ☒☐☐☐ ☒☐☐☐ Strength of recommendation: Weak
**KQ 15: What is the preferred laparo-endoscopic repair method for umbilical or epigastric hernias?**

**Statement:** Novel laparo-endoscopic techniques including robot-assisted techniques with extraperitoneal mesh placement seem promising with theoretical advantages to traditional IPOM technique. There is insufficient data to suggest one technique over another for repair of umbilical or epigastric hernias. As an intraperitoneal mesh may cause adhesions, an extraperitoneal mesh placement is suggested when possible. Closure of the defect seems to decrease seroma formation, bulging and recurrence. A mesh overlap of at least 5 cm seems to decrease recurrence rates. For IPOM repairs, fixation of the mesh using non-absorbable sutures or tackers decreases recurrence rate.

**Recommendation:** When doing a laparo-endoscopic umbilical or epigastric hernia repair, it is suggested to close the defect when possible and to place the mesh extraperitoneally with an overlap of at least 5 cm. It is suggested to fixate an intraperitoneal mesh with non-absorbable sutures or tackers.

**Quality of evidence:** ☐ ☐ ☐ ☐  
**Strength of recommendation:** Weak
KQ 16: Which is the preferred repair method of umbilical and epigastric hernias based on hernia and patient characteristics?

**Statement:** Most umbilical and epigastric hernias have defect sizes less than 2 cm and can be repaired with an open mesh repair. For larger defects or in patients with an increased risk of wound complications, laparoscopic repair may be used.

**Recommendation:** Although most of the umbilical and epigastric hernias can be repaired with an open preperitoneal flat mesh, it is recommended tailoring the repair based on patient and hernia characteristics and local resources. Patient and surgeon preferences should also be taken into account.

**Quality of evidence:** ⅹ☐☐☐ ☑ Strength of recommendation: strong (upgraded)
KQ 17. What is the learning curve for umbilical and epigastric hernia repair?

**Statement:** The evidence on learning curve for umbilical and epigastric hernia repairs is very limited. Standardised programs including lectures and simulation training for hernia repair seem promising. Open umbilical and epigastric hernia repairs are often performed in a day-care setting and are suitable for training of surgical trainees. The specific number of procedures necessary to perform the procedure independently has not been assessed in the literature. For laparoscopic ventral hernia repairs, the complication and recurrence rate seem to decrease after around 30 procedures.

**Recommendation:** The learning curve for open and laparoscopic umbilical and epigastric hernia repair is suggested to be around 20 and 30 supervised procedures, respectively. It is suggested to make a standardised training program where surgical trainees are evaluated as to when they can perform the procedures safely and independently.

**Quality of evidence:** ★★★☆☆

**Strength of recommendation:** weak
KQ 18: How can cost of umbilical and epigastric hernia repair be influenced?

Statement: Costs for umbilical and epigastric hernia repair will increase when wound complications and recurrence occur. Costs can be reduced by preoperative optimization, by using a low cost permanent flat mesh at repair and by reserving the laparoscopic technique for patients in high risk of wound complications.

Recommendation: To reduce the costs of umbilical and epigastric hernia repair, it is suggested to perform an open repair with a flat mesh in a day-care setting with the utmost effort to reduce complications like infection and recurrence by considering preoperative optimization and tailoring the approach.

Quality of evidence:  ★★★★★ Strength of recommendation: Weak
TREATMENT ALGORITHM

Symptomatic umbilical or epigastric hernia
advise smoking cessation 4-6 prior to surgery and weight loss to BMI < 35 kg/m²

<table>
<thead>
<tr>
<th>Defect size</th>
<th>Technique</th>
<th>Mesh placement</th>
<th>Mesh overlap</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 cm</td>
<td>open</td>
<td>preperitoneal</td>
<td>3 cm</td>
</tr>
<tr>
<td>2-4 cm</td>
<td>open</td>
<td>preperitoneal</td>
<td>3 cm</td>
</tr>
<tr>
<td></td>
<td>laparoscopic</td>
<td>extraperitoneal</td>
<td>5 cm</td>
</tr>
<tr>
<td>&gt; 4 cm</td>
<td>Treat as an incisional hernia</td>
<td></td>
<td></td>
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</tbody>
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Next Steps

• Publication BJS

Guidelines for treatment of umbilical and epigastric hernias from the European Hernia Society and Americas Hernia Society

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• Consensus Voting (EHS meeting Hamburg)