LAPAROSCOPIC INGUINAL HERNIA REPAIR

Where are we?

Michael Timoney, MD
George Ferzli, MD, FACS
Levels of evidence

1A  Systematic review of RCTs with consistent results from individual (homogenous) studies.
1B  RCTs of good quality.
2A  Systematic review of cohort or case-control studies with consistent results from individual (homogenous) studies.
2B  RCT of poorer quality or cohort or case-control studies.
2C  Outcome studies, descriptive studies.
3   Cohort or case-control studies of low quality.
4   Expert opinion, generally accepted treatments.

Grades of recommendation

A   Supported by systematic review and/or at least 2 RCTs of good quality
    Level of evidence 1A, 1B
B   Supported by good cohort studies and/or case control studies
    Level of evidence 2A, 2B
C   Supported by case series, cohort studies of low quality and/or ‘outcomes’ research
    Level of evidence 2C, 3
D   Expert opinion, consensus committee
    Level of evidence 4
How is inguinal hernia treated?

Observations:

Level 1A

Primary
• Shouldice hernia repair technique is the best non-mesh repair method.

Mesh
• Operation techniques using mesh result in fewer recurrences than techniques which do not use mesh.

Laparoscopic
• Laparoscopic inguinal hernia repair results in
  • lower incidence of wound infection, hematoma formation
  • earlier return to normal activities or work than the Lichtenstein technique.
  • longer operation time and a higher incidence of seroma than the Lichtenstein technique.
How is inguinal hernia treated?

Level 1B

Mesh

• Mesh repair appears to reduce the chance of chronic pain rather than increase it.

• Lap mesh techniques: less chronic pain/numbness than Lichtenstein.
  • Long term (> 3/4 years) these differences decrease for pain but not numbness.

• Material reduced meshes have some advantages with respect to long-term discomfort and foreign body sensation in open hernia repair.
  • May be associated with an increased risk for hernia recurrence.
How is inguinal hernia treated?

Level 1B

Cost
• For hospitals, open mesh procedure is the most cost-effective operation in primary unilateral hernias.

• The endoscopic procedure is probably the most cost-effective approach for patients who participate in the labour market especially for bilateral hernias.

• In cost-utility analyses including quality of life (QALY’s) endoscopic techniques (TEP) may be preferable since they cause less numbness and chronic pain and earlier return to work.
How is inguinal hernia treated?

TAP P vs. TEP

Level 2A
For endoscopic inguinal hernia techniques, TAPP seems to be associated with higher rates of port-site hernias and visceral injuries while there appear to be more conversions with TEP.

Level 2B
There appears to be a higher rate of rare but serious complications with endoscopic repair especially during the learning curve period.

European Hernia Society Guidelines: Treatment of Inguinal Hernia in Adult Patients
How is inguinal hernia treated?

Level 2C

Learning curve
• The learning curve for performing endoscopic inguinal hernia repair (especially TEP) is longer than for open Lichtenstein repair, ranging between 50 and 250 procedures, with the first 30-50 being most critical.

• There does not seem to be a negative effect on outcome when operated by a resident vs. an attending surgeon.

• Specialist centers seem to perform better than general surgical units, especially for endoscopic repairs.
Mesh fixation modalities in endoscopic inguinal hernia repair

• Is it necessary to fixate the mesh in endoscopic inguinal hernia repair?

• What kind of fixation is to be preferred?

Kuhury, E; Montgomery, A; Fortelny, R  Mesh fixation modalities in endoscopic inguinal hernia repair.
Mesh Fixation Modalities: Statements

Grade 1B

Mesh fixation and non-fixation are both associated with equally low recurrence rates in both TAPP and TEP.

Non-fixation is associated with a less or similar risk for development of chronic pain compared to fixation.

Fixation of the mesh is more expensive than non-fixation.

The use of fibrin glue was associated with low recurrence rates.

Fibrin glue for mesh fixation is associated with less chronic pain than stapling.

Grade 5

Fibrin glue is less expensive than most stapling devices.

Kuhury, E; Montgomery, A; Fortelny, R  Mesh fixation modalities in endoscopic inguinal hernia repair.
Management of recurrent inguinal hernias

Primary Repair = Tissue Repair

- Open Anterior
  - Lichtenstein
  - Plug and Patch
  - Prolene Hernia System
- Open Posterior
  - Read, Rives, Stoppa
  - Kugel
- Laparoscopic
  - TEP
  - TAPP

Primary Repair = Mesh Repair

- Previous mesh repair through Anterior Approach
  - Options for Repair
    - Read, Rives, Stoppa
    - Kugel
    - Laparoscopic
- Previous mesh repair through Posterior Approach
  - Options for repair
    - Lichtenstein
    - Prolene Hernia System
    - Plug and Patch

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What are the indications for laparoscopic inguinal hernia repair?

**Recurrent hernia**
- Avoids scar tissue
- Visualizes occult hernia

**Bilateral hernia**
- Decreased pain
- Earlier return to work
- No difference in recurrence or complication

**Obese / Athletic patients**
- Definitive diagnosis
- Reduced infection in susceptible population

**Patients with contralateral injury to vas deferens**
- Less chance to injure other vas
Are there contraindications to laparoscopic inguinal hernia repair?

Contraindications
- Patients for whom general anesthesia and pneumoperitoneum are risks (cardiac, pulmonary disease)

Relative Contraindications
- Prior pre-peritoneal surgery (prostate, hernia, vascular, kidney transplant)
- Prior laparotomy
- Ascites
- Anticipated bleeding (patients on anti-coagulation)
- Strangulated hernia
- Giant scrotal hernia
How do recurrence rates for open and laparoscopic hernia repair compare?

<table>
<thead>
<tr>
<th>Reference</th>
<th>Year</th>
<th>Pts/R</th>
<th>Hrns</th>
<th>Hernia Tech</th>
<th>RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay-Nielson</td>
<td>2001</td>
<td>547</td>
<td></td>
<td>Lap</td>
<td>1.6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9,982</td>
<td></td>
<td>Licht</td>
<td>1.0%</td>
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<tr>
<td></td>
<td></td>
<td>4,373</td>
<td></td>
<td>Muscle repair</td>
<td>2.7%</td>
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<tr>
<td>EU Hernia</td>
<td>2002</td>
<td>1,643</td>
<td></td>
<td>Lap</td>
<td>2.2%</td>
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<tr>
<td>Trialist Collab</td>
<td></td>
<td>1,612</td>
<td></td>
<td>Open</td>
<td>1.7%</td>
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<tr>
<td>Neumayer</td>
<td>2004</td>
<td>862</td>
<td></td>
<td>Lap</td>
<td>10.1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>834</td>
<td></td>
<td>Open</td>
<td>4.9%</td>
</tr>
<tr>
<td>“Highly experienced”</td>
<td></td>
<td></td>
<td></td>
<td>Lap</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>“Less than 250”</td>
<td></td>
<td></td>
<td></td>
<td>Lap</td>
<td>&gt;10%</td>
</tr>
</tbody>
</table>

No difference in rate of recurrence between laparoscopic and open procedures for primary hernia repair.
What is the role of laparoscopy for treating recurrent inguinal hernia?

Laparoscopy vs. Lichtenstein

- Less pain
- Earlier return to activity
- No missed hernia
- Less recurrence
## Re-recurrence after lap repair for recurrence (national and large studies)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Year</th>
<th>Pts/Hrns</th>
<th>PT</th>
<th>RT (no. Pts or Hrns)</th>
<th>RR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haapaniemi</td>
<td>2001</td>
<td>NA/2,688</td>
<td>Ant.</td>
<td>TAPP, TEP (670)</td>
<td>1.79</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Licht. (685)</td>
<td>1.46</td>
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<td></td>
<td></td>
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<td>Plug (276)</td>
<td>2.54</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Other Mesh (574)</td>
<td>3.83</td>
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<td></td>
<td></td>
<td></td>
<td>Non-mesh (483)</td>
<td>4.35</td>
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<tr>
<td>Bay-Nielson</td>
<td>2001</td>
<td>NA/3,943</td>
<td>Var.</td>
<td>TAPP (560)</td>
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<td></td>
<td></td>
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<td></td>
<td>TEP (78)</td>
<td>1.3</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Muscle (645)</td>
<td>6.7</td>
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<td></td>
<td></td>
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<td>Licht. (1,697)</td>
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<td></td>
<td></td>
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<td></td>
<td>Plug (212)</td>
<td>3.8</td>
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<td></td>
<td></td>
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<td>Plug and patch (358)</td>
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<td></td>
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<td></td>
<td></td>
<td>Other mesh (393)</td>
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<tr>
<td>Wara</td>
<td>2005</td>
<td>NA/6,689</td>
<td>Licht.</td>
<td>Unilateral recurrent hernia</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lap. (1,361; 92% TAPP)</td>
<td>4.63</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Licht. (4,633)</td>
<td>4.79</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Bilateral recurrent hernia</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Lap (498; 92% TAPP)</td>
<td>2.61</td>
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<tr>
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<td></td>
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<td></td>
<td>Licht. (172)</td>
<td>7.56</td>
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<tr>
<td>Bokeler</td>
<td>2008</td>
<td>1,689/1,755</td>
<td>Ant.</td>
<td>TAPP</td>
<td>0.6</td>
</tr>
<tr>
<td>Bisgaard</td>
<td>2008</td>
<td>NA/1,124</td>
<td>Licht.</td>
<td>Lap. (388; 95% TAPP)</td>
<td>1.3</td>
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<tr>
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<td></td>
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<td>Non-mesh (198)</td>
<td>19.2</td>
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<td></td>
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<td>Mesh (non-Licht.) (194)</td>
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</tr>
</tbody>
</table>

Pts, patients; Hrns, hernias; PT, primary technique; RT, recurrent technique; RR, recurrence rate; NA, not available; Var., various; TAPP, trans-abdominal pre-peritoneal repair; TEP, totally extra-peritoneal repair; Licht., Lichtenstein repair; Lap, laparoscopy
## What Are the Recommendations for Laparoscopic Management of Complex Hernias?

<table>
<thead>
<tr>
<th>Complex Hernia Type</th>
<th>Management Recommendations</th>
<th>Level of Evidence</th>
</tr>
</thead>
</table>
| Scrotal                             | • TAPP and TEP can be used with good results  
  • Reserved for highly experienced TAPP/TEP surgeons | III (Ferzli, Liebl, Palanivelu) |
| Incarcerated Inguinal               | • TAPP may be used for acute or chronic incarceration  
  • TAPP allows easy inspection of questionable bowel  
  • TEP may be used for acute or chronic incarceration  
  • Must convert to intra-abdominal port to inspect bowel  
  • Reserved for highly experienced TAPP/TEP surgeons | IV (Palanivelu, Leibl, Rebuffat, Ishihara, Legnani, Scierski) |
|                                     |                                                                                           | III (Ferzli, Tamme, Saggar) |
| Strangulated Hernia with Peritonitis| • Laparoscopic (TAPP or TEP) repair of strangulated hernia should be avoided in the setting of:  
  ❖ Frank peritonitis  
  ❖ Infected abdominal wall  
  ❖ Necrotic bowel | IV (Liebl, Ishihara, Ferzli) |
Conclusions:

• Laparoscopic inguinal hernia repair is feasible for primary, bilateral and recurrent hernias.

• A thorough knowledge of the anatomy is of utmost importance.

• The main challenge remains the learning curve.

• Recurrence after anterior repair → Posterior repair

• Recurrence after posterior repair → Anterior repair
## References


References


29) Bittner R, Schwarz J, Recurrent Hernia; Prevention and Treatment VIII 26.3; How to treat recurrent inguinal hernia – TAPP

References


References


References


References
