„tailored hernia surgery“

Mauritius  July 28th 2010

Ralph Lorenz
„tailoring“
principle of tailoring

- pattern
- choice of drapery
- choice of accessories
- studio and sewing machine
- craftsman apprenticeship
- journeyman’s piece
- masterpiece
„tailored surgery“

- anatomy
- classification and risk profile
- choice of mesh
- positioning and fixation
- standardisation
- surgical training and education
- quality management
- masterpiece
Henry FRUCHAUD
*1894 †1960

- medial triangle = HESSELBACH triangle
- lateral triangle
- femoral triangle

anatomy

„Myopectineal orifice“
Dimensions of the myopectineal orifice

- 7,8 (±3,0) cm in width
- 6,5 (±1,9) cm in height
- ♂ 7,6 x 7,6 cm
- ♀ 8,1 x 5,3 cm
- *a mesh measuring 10 x 8 cm is suitable for both genders*

*T. Wolloscheck, M.A. Konerding 2009 (Hernia) 13: 639 - 642*
anatomy of nerves

Evidence grade 2A
Identification

Evidence grade 2B
Resection at risk

*EHS – Guidelines
Simons et al
Hernia 13 (2009) 343-403

How should we handle the nerves?
different inguinal hernias
Classification inguinal hernia

M,C,L,F = medial, combined, lateral, femoral

R* 0-x = Recurrence

I = up to 1.5 cm diameter
II = 1.5 to 3 cm diameter
III = over 3 cm diameter

* Aachen classification = SCHUMPELICK classification

European Hernia Society
Hernia August 09
risk factors for „hernia disease“

- genetic
- smoking
- COPD, asthma
- diabetes
- overweight
- cancer in anamnesis
- physical strain
with or without any mesh?

**meta-analyses:**

**with mesh - better than without**

*SCOTT, WEBB et al, Cochrane Institut Library Issue 2, 2001*

- EU Hernia Trialist Collaboration, 2000 British Journal of Surgery,
- 87,860-867
- 1,4% recurrent rate with mesh
- 4,4% recurrent rate without mesh

**Shouldice - best technique without mesh**

* Cochrane Institut Library, 1996
Use of mesh in Germany 2003-2008?

*BQS
Nordrhein Westphalen
2009
different techniques in Hernia surgery Europe 2006

*EHS Guidelines Hernia(2009) 13:343-403*
right choice of mesh?
130 meshes
Long term results with heavy weight meshes

• Diskomfort
• Stiff abdomen
• Chronic pain
Ideal mesh 2010?

- Polypropylene (non absorbable, monofilament)
- Light weight concept (less 50g/m²)
- Macroporous (more than 1mm pore size)
- Stability (16N/cm)
- Elasticity (more 20%)
bridging
Bridging = Macroporous mesh concept
why partly absorbable meshes?

„Less is more!“

• less material after scarring
• intelligent mesh
• high stability
• more flexibility
• more comfort
• less chronic pain

*Holste JL. Are meshes with lightweight construction strong enough? Int Surg. 2005;90(suppl. 3); S10-S12.
decision
which technique
“…there is no standard patient and no standard of hernia. That's why no standard technique to reach a standard result…”

*Prof. Dr. U. Klinge 2nd Berlin Herniadays 2008
open suture

• SHOULDICE

1944 first report about 272 patients (Ontario Medical Association)
1953 first description of the technique (the treatment of hernia, Ontario Medical Review 1953, 1-14)

Indication:
• small hernias in young persons without risk profile
• “sportsmen´s hernia”
Open mesh

- LICHTENSTEIN*1984
- STOPPA *1968
- RUTKOW *1993
- MILLIKAN *2001
- UGAHARY *1998
- PELISSIER *2001
- GILBERT *1998
## Possibilities of mesh placement

<table>
<thead>
<tr>
<th>Mesh Placement Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Onlay</strong></td>
<td>(= anterior or prefascial)</td>
</tr>
<tr>
<td><strong>Inlay</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Sublay</strong></td>
<td>(= retromuscular, extraperitoneal)</td>
</tr>
<tr>
<td><strong>3-D-Meshes</strong></td>
<td>(= anterior and posterior)</td>
</tr>
</tbody>
</table>
Possibilities of mesh placement

- Onlay (LICHTENSTEIN)
- Inlay (RUTKOW)
- Sublay (PELISSIER)
- 3-D-Meshes (UPP/UHS)
mesh placement in incisional hernias?

Onlay

Inlay

Sublay

*Velasco et al., Hernia 1999,4*
Irving LICHTENSTEIN*1984

- simple
- easy to perform
- short learning curve
- tensionfree
- worldwide most popular
- local anaesthesia

but!
Irving LICHTENSTEIN*1984

but!

• Problems with big hernias - standard?
• Not covering the MPO?
• Wrong positioning of mesh
• Onlay mesh contacts nerves = chronic pain
• Recurrences mostly mediocaudal because of insufficient fixation
Irving LICHTENSTEIN*1984

Indication:

• Medial and Larger Hernias with no possibilities to create the preperitoneal space
  i.e. after Prostatectomy, Vascular surgery
Rene STOPPA *1968

posterior approach
preperitoneal/retromuscular mesh placement
indication for large inguinal hernias
covering the whole MPO
initially use of Dacron later Polypropylene

but!

traumatic
Developement of the plug technique

- PHELPS *1894
- USHER *1958
- LICHTENSTEIN *1968
- GILBERT *1988
- RUTKOW *1993
- MILLIKAN *2001
RUTKOW *1993

4 million
Perfix Plugs
but!

- heavy weight mesh with rigid structure
- third dimension
- discomfort
- chronic pain

severe complications are possible after Perfix-Plug: Colon fistula

but!
Keith MILLIKAN*2001

- modification of the Perfix Plug
- fixation of the inner sheets of the plug
- like an in- and sublay repair
possible answer: UPP® = Ultrapro plug
UPP®= Ultrapro plug
**Indication:**

- Medium size direct and indirect Hernia with no high risk profile
F. UGAHARY

= grid iron Technik *1998

small skin incision like in appendectomy
10 x 15 cm mesh, only one fixation stitch

But!

- Difficult technique
- Long learning curve
- Retrograde percentage in the Netherlands
  4,6% 2001 ➤ 2,2% 2005
Edouard Pélissier*2001
Edouard Pélissier*2001

but!

• memory ring?
• heavy weight mesh
Arthur I. GILBERT *1998

- Founder of the hernia Institute in Florida in South Miami
- Classification
- Development of procedures:

Prolene Hernia System = PHS 1998
PHS®/UHS®

Prolene Hernia System
Ultrapro Hernia System

- three-dimensional device (onlay – connector – underlay)
- minimum pain
- low recurrence rate


*Polat et al, Umbilical hernia repair with the prolene hernia system. Am J Surg (2005), pp 61-64

*Perrakis et al. A new tension-free technique for the repair of umbilical hernia, using PHS. Hernia (2003), pp 178-180
### PHS - 5 year results

<table>
<thead>
<tr>
<th>32 months</th>
<th>54 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recurrence rate 1.8%</td>
<td>• Recurrence rate 2.3%</td>
</tr>
<tr>
<td>• Chronic pain 3.2%</td>
<td>• Chronic pain 1.8%</td>
</tr>
<tr>
<td></td>
<td>• Testicular atrophy 1.4%</td>
</tr>
<tr>
<td></td>
<td>• Hypaesthesia 4.4%</td>
</tr>
</tbody>
</table>

* Faraj et al Hernia 14 (2010) 155-158
UHS® = Ultrapro Hernia System

after PHS new developed for the lightweight concept
composed of almost equal parts of absorbable Monocryl and Prolene
more than 60% less remaining foreign body permanently implanted
markings and colourings
UHS®

most important step: preparation of the epigastric vessels and of the triangle of doom
UHS® = Ultrapro Hernia System

**Indication:**

- Big direct or indirect hernias or
- Pantaloon Hernias or
- Hernias with a high risk profile
laparoscopic view on ingrowing UHS OVAL

Foto: Tim Tollens
UPP®/UHS®
tailored concept

6 different sizes of the preperitoneal stabilization

UPP S Ø 3 cm
UPP M Ø 4 cm
UPP L Ø 5 cm
UHS M - Ø 7,5 cm
UHS L - Ø 10 cm
UHS OVAL - 10 x 12 cm
### Laparoscopic mesh repair

<table>
<thead>
<tr>
<th>TAPP *1991</th>
<th>TEP*1992</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Arregui</em></td>
<td><em>Duluq und Begin</em></td>
</tr>
<tr>
<td><em>Fitzgibbons</em></td>
<td><em>Ferzli, Mc Kernan, Philips, Hourlay</em></td>
</tr>
</tbody>
</table>

indication for bilateral hernias
Recurrences after open techniques?

**but!**
but!

problems with fixation in laparoscopy
3. Load-dependent inguinal pain left and right

but!

1. Recurrent hernia left

4. Patient employs a lawyer

2. Hydrocele right

after both side TAPP
06/2008
Laparoscopic or open

- Recurrence rate in Laparoscopy up to 10% compared to 5% in open repair
- **Major complications**
- Same results only in case of high volume laparoscopy

*NEUMAYER- Salt Lake City, NEJM Bd. 350 (2004), 1819 und 1895*
own therapy concept

recommendation for tailored surgery depending on

- classification of the hernia
- age und comorbidity
- risk profile for a hernia disease
- physical strain (balance between elasticity and stability)
- wish of patient
„...cost savings“

...In the United States most hernia repairs (80-90%) are performed as day surgery procedure; 90% of operations are open herniorrhaphies with mesh.

If in Germany an equal proportion of hernia repair as in the United States would be done as ambulatory procedure (80-90%), there would be an annual cost saving of several hundred million Euro

outpatients

Percentage of daycase inguinal hernia surgery

(* International Association for Ambulatory Surgery (IAAS) (2005))
Standards?

EHS-Guidelines for treatment of inguinal hernia in adults

* Hernia 2009
Standard meaning?

TED – voting for SHOULDICE repair

- Continuous 4-liners steel
- Continuous 3-4 lines non resorbable
- Continuous 3-4 lines resorbable
- Continuous 2 line non resorbable
- Continuous 2 line resorbable
- Single stitches

*Berlin Herniadays – January 2010, TED voting among 300 herniologists
Surgical training and education

in former times  today?
„surgeons satisfaction“, depending on learning curve

„…you can’t see quality at the first view!“
„For no other operation in general surgery are the results so dependent on the skill and experience of the surgeon.“

*George E. Wantz*
German Hernia Database Registry

start: 01.12.2009
Director of studies: Prof. Dr. Köckerling
Berlin
Scientific board with 14 members from Germany and Austria
• participation voluntary
• online Project
• all types of hernias (inguinal, incisional, umbilical, parastomal, hiatal)
• Follow-up (1, 5, 10 years)
• participation at no charge

english version is now available

www.herniamed.com
Own results:

Quality institute for operative medicine
University of Magdeburg

• Multicenter Study
• Online Project
• duration 1 year
• 1000 patients in 15 german hernia centers
• use of 3- D- Meshes
• follow up after 4, 12 and 52 weeks
• Carolina Comfort Scale after 4, 12 and 52 weeks
• criteria: pain and recurrence
Carolina Comfort Scale
Own results:

start: 1.10.2009

27.05.2010
– 925 patients
– men 823 Ø53 years
– woman 101 Ø56 years
3CHIRURGEN

primary / recurrent Hernia

<table>
<thead>
<tr>
<th></th>
<th>primary</th>
<th>recurrent</th>
</tr>
</thead>
<tbody>
<tr>
<td>patients</td>
<td>805</td>
<td>101</td>
</tr>
<tr>
<td>%</td>
<td>89%</td>
<td>11%</td>
</tr>
</tbody>
</table>

outpatient / inpatient

<table>
<thead>
<tr>
<th></th>
<th>outpatient</th>
<th>inpatient</th>
</tr>
</thead>
<tbody>
<tr>
<td>patients</td>
<td>569</td>
<td>345</td>
</tr>
<tr>
<td>%</td>
<td>62%</td>
<td>38%</td>
</tr>
<tr>
<td>anesthesia</td>
<td>local</td>
<td>regional</td>
</tr>
<tr>
<td>------------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>12</td>
</tr>
<tr>
<td>patients</td>
<td>2.5%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

Ol-duration

Ø 39 min
Which mesh is used?

<table>
<thead>
<tr>
<th></th>
<th>UHS</th>
<th>UPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>number of patients</td>
<td>504</td>
<td>395</td>
</tr>
<tr>
<td>%</td>
<td>56%</td>
<td>44%</td>
</tr>
</tbody>
</table>
First results:
follow up after 4 weeks/3 months

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disturbance of sensitivity</td>
<td>99 (9.9%)</td>
</tr>
<tr>
<td>Testicular pain</td>
<td>19 (2.3%)</td>
</tr>
<tr>
<td>Inguinal pain</td>
<td>43 (4.6%)</td>
</tr>
<tr>
<td>Seroma</td>
<td>32 (3.5%)</td>
</tr>
<tr>
<td>Infection</td>
<td>2 (0.2%)</td>
</tr>
<tr>
<td>Recurrence</td>
<td>6 (0.6%)</td>
</tr>
</tbody>
</table>
### conclusion

- tailored principle is better than gold standard
- open mesh techniques have widespread possibilities to adapt on **every** hernia
- open mesh techniques with new devices combines a simple and save access with low complications, high patient comfort and low costs
„...tailor your standard“

and

„... standard your tailored concept!“
masterpiece?

Ideal mesh?
Networking!