Laparoscopic assisted creation of neovagina

S. Brucker
D. Wallwiener

Frauenklinik

Universitäts-
Tübingen
Management of vaginal agenesis (Tübingen)

Vaginal agenesis

Pre-operative procedure

- No: Lsc.-ass. Neovagina (Vecchietti)
- Yes: Mc Indoe

Oncological Operation

- Sigma

Brucker: Geburtsh Frauenheilk 2005 Nov
Congenital Vaginal Agenesis

- Mayer - Rokitansky - Küster - Hauser – Syndrom (Incidence 1: 4000 - 5000)
- AIS = Androgen Insensitivity Syndrom (Incidence 1: 25000)

Oppelt, Brucker: Hum Reprod. 2006 Mar
### Laparoscopic neovagina (peritoneum)

**Davydov**

<table>
<thead>
<tr>
<th>Studies</th>
<th>Patients</th>
<th>Follow-up</th>
<th>Length neovagina</th>
<th>complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 studies</td>
<td>28 each</td>
<td>1-8 years</td>
<td>7-8 cm</td>
<td>Intra-operative bladder and ureteric injury (n=4) abdominal migration of the mould (n=2) vesico-vaginal fistula (n=3) Need for re-operation (n=4): incision, dilation n.a. Intraoperative: None, urinary retention after catheter removal (n=5) n.a.</td>
</tr>
<tr>
<td>1 study</td>
<td>12</td>
<td>6-44 mo (mean30)</td>
<td>8-10 cm</td>
<td></td>
</tr>
<tr>
<td>1 study</td>
<td>30</td>
<td>7-8 cm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 prospective study</td>
<td>31</td>
<td>12 months</td>
<td>6.27 cm (mean)</td>
<td></td>
</tr>
</tbody>
</table>

**Disadvantages:**
- Shrinking: time-life need for dilators, no lubrication: need for lubricans, fistula, prolaps, cancer, blood loss,
- longer operation time (2-3 times compared with Vecchietti), shorter length of neovagina

**Advantages:**
- Short hospital stay, no particular instrumentation required, relative simplicity

**Indication:**
- MRKH-syndrome

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# Laparoscopic neovagina (Bowl)

<table>
<thead>
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<th>complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 case report: colon neovagina following radical HE with subtotal colpectomy and radiotherapy</td>
<td>1 (43 y)</td>
<td>12 months</td>
<td>n.a.</td>
<td>Stenosis introitus → incision</td>
</tr>
<tr>
<td>1 prosp. study</td>
<td>7</td>
<td>31 months (mean)</td>
<td>7-15 cm</td>
<td>Vulvar haematoma</td>
</tr>
<tr>
<td>1 retrospective study</td>
<td>26</td>
<td>3-46 months</td>
<td>10-15 cm</td>
<td>Dilatation introitus (n=2) Blood transfusion (n=1) Infection, abscess (n=3)</td>
</tr>
</tbody>
</table>

**Disadvantages:**
- Smelling lubrication, Dyspareunia, Colitis, severe complications until death, big operativ-technicale deal
- Prolaps (n=5), Cancer (n=5), Necrosis (n=4), Colitis (n=6), Anastomosis insufficancy and death (n=1)

**Advantages:**
- Only little shrinking tendency, good lubricance, no need for post-operative phantomes

**Indication:**
- Patients with major oncological surgeries

Darai E. Hum Reprod. 2003 Nov;18(11):2454-9  
Cai B, BJOG 2007; 114:486-1492
### Laparoscopic neovagina
**Modified Vecchietti**

<table>
<thead>
<tr>
<th>Studies</th>
<th>Patients</th>
<th>Follow-up</th>
<th>Length neovagina</th>
<th>complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 study</td>
<td>110</td>
<td>&gt;/= 12 months</td>
<td>&gt;/=6 cm</td>
<td>Intra-operative bladder injury (n=4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Perforation of rectal wall (n=2)</td>
</tr>
<tr>
<td>1 study</td>
<td>86</td>
<td>&gt;/= 12 months</td>
<td>6-9cm (mean 7.5)</td>
<td>Unsuccessful operation (n=3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>none</td>
</tr>
</tbody>
</table>

**Disadvantages:**
Postoperative need for dilatation (> 6 months)

**Advantages:**
small surgical trauma, no severe complication, very high success rates, normal mucosa, good lubrication
no prolapse, short period of postoperative tension, small surgical trauma, no severe complication

**Indication:**
MRKH-syndrome

Laparoskopie bei MRKH
Mayer-Rokitansky-Küster-Hauser-Syndrom

(Incidence 1: 4000 - 5000)

Diagnostic:

- History
- ultrasound of vaginal vestibule (rectum)
- digitale palpation (vaginal, rectal)
- **Chromosome analysis**
- Hormon status
- **Uro-MRI**
- diag. LSC
Patient 1: URO-MRI
Malpractice (n=163)

Hymen atresia 15.4%
(Hymen incision 8%)
Ovarian insufficiency 25.5%
TOTAL 40.9%

3 „A“: asymptomatic, amenorrhoe, aplasia

Laparoscopic-assisted Neovagina:
Optimizing due to new traction device and vagino-abdominale Perforation without dissection of vesico-rectale space

Surgical steps
Since 1992: by LSC (Wallwiener)

- 1. laparoscopic step:
  Recto-vaginale palpation, zystoscopic diaphanoscopy, laparoscopic desicion of the perforation point

- vaginal step:
  perforation of vaginale membrane without dissection

- 2. laparoscopic step:
  retroperitonally guidance of threads

- Fixation of traction device

Gauwerky, Wallwiener: Arch Gynecol Obstet 1992; 252
Laparoscopic-assisted creation of a neovagina acc. to Brucker, Wallwiener
## Thread Guide
- **straight Thread Guide**
  - vagino-abdominale perforation
- **two Curved Thread Guides**
  - peritonealization

## Pluggable segmented dummy
- central hole for flowing off secretion
- determine of the exact length of the neovagina
- suprapubic catheter

## Traction device
- no ripping off of the threads
- stable direction of the tension
- possibility of tighten equally both traction threads
- no unintentional opening
- smooth surface

## Dummies
postoperative dummies, different sizes for individually use
(length 10 cm or 12 cm; diameter 2; 2,5 and 3 cm)
Vaginal agenesis - A prospective interventional study in 152 cases using a new laparoscopic Vecchietti-based procedure without vesicorectal tunnelling

Vagino-abdominale perforation with vs. non dissection of vesico-rectale space

\[ n_1 = 12 \quad | \quad n_4 = 140 \]

Optimized armentarium vs. konventional armentarium

\[ n_3 = 122 \quad | \quad n_2 = 30 \]

\[ n = 152 \]
Laparoscopic-assisted Neovagina
Placement of the traction device and fixation of the threads
Placement of the traction device and fixation of the threads
Laparoscopic-assisted Neovagina: Optimizing due to new traction device and vagino-abdominale Perforation without dissection of vesico-rectale space

Advantages

- Exacte localisation of perforation point due to simultaneously intraoperative zystoscopie and rectale Palpation
  - prevention of bladder and bowl lesions

- threads are totally subperitoneal
  - prolaps

- Infinitely variable and equally tighten of both traction threads
  - tearing of the neovagina

- psychosocial support: better compliance for postoperative use of dummy
  - early shrinking of neovagina
Removing of traction device

http://www.neovagina.de/index.php?lang=en&prt=fach&auth=L3rd6o60Mu8z
Laparoscopic-assisted Neovagina

**Results:**

vagino-abdominale Perforation with vs non dissection of vesico-rectal space

<table>
<thead>
<tr>
<th>Variable</th>
<th>Vagino-abdominal perforation (N=101)</th>
<th>Instrumentation (N=101)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With tunnelling</td>
<td>without tunnelling</td>
</tr>
<tr>
<td>Group 1</td>
<td>Group 4</td>
<td>Group 3</td>
</tr>
<tr>
<td>(N=12)</td>
<td>(N=89)</td>
<td>(N=71)</td>
</tr>
<tr>
<td>Age (years)</td>
<td>19.2 ±6.1</td>
<td>21.2 ± 6.2</td>
</tr>
<tr>
<td>Diagnosis(a) (N [%])</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRKH</td>
<td>10 (87.5)</td>
<td>83 (93.3)</td>
</tr>
<tr>
<td>AIS</td>
<td>2 (12.5)</td>
<td>6 (6.7)</td>
</tr>
<tr>
<td>Deformities(b) (N [%])</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urinary tract [pelvic kidney]</td>
<td>NR</td>
<td>22 (26.5) [6 (7.2)]</td>
</tr>
<tr>
<td>Skeletal(c)</td>
<td>NR</td>
<td>8 (9.6%)</td>
</tr>
<tr>
<td>Preoperative depth of vaginal dimple (cm)</td>
<td>NR</td>
<td>1.7 ± 1.5</td>
</tr>
<tr>
<td>Predistension (N [%])</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>NR</td>
<td>23 (25.8)</td>
</tr>
<tr>
<td>No</td>
<td>NR</td>
<td>66 (74.2)</td>
</tr>
</tbody>
</table>

*Brucker: Fertil Steril. 2007 Feb;87(2)*
### Laparoscopic-assisted Neovagina

**Results:**

**vagino- abdominale Perforation with vs non dissection of vesico-rectal space**

<table>
<thead>
<tr>
<th></th>
<th>With vrD</th>
<th>No vrD Old Set</th>
<th>No vrD New Set</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operation Time (min)</strong></td>
<td>113*</td>
<td>93,5*</td>
<td>42,5*</td>
</tr>
<tr>
<td></td>
<td>(75 - 155)</td>
<td>(55 - 150)</td>
<td>(20 - 114)</td>
</tr>
<tr>
<td><strong>Passagere intraoperative</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Via falsa: bladder (rectum)</td>
<td>1 (0)</td>
<td>1 (0)</td>
<td>2 (0)</td>
</tr>
<tr>
<td><strong>Injury of A. Iliaca externa</strong></td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Haematoma bladder (SPK)</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Bleeding after removing device</strong></td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Post-op. length neovagina (cm)</strong></td>
<td>8,9</td>
<td>7,8</td>
<td>9,5</td>
</tr>
<tr>
<td></td>
<td>(6 -12 )</td>
<td>( 6 - 12)</td>
<td>(6 - 12,5)</td>
</tr>
<tr>
<td><strong>Time of tension (Days )</strong></td>
<td>11,7*</td>
<td>7,5*</td>
<td>4,6*</td>
</tr>
<tr>
<td></td>
<td>(7 - 15)</td>
<td>(4 - 13)</td>
<td>(2 - 7)</td>
</tr>
</tbody>
</table>

*p = 0.0559  *p < 0.0001  *p < 0.0001
### Results: Optimized vs. Conventional Armentarium

<table>
<thead>
<tr>
<th>Event</th>
<th>New Set (n_3 = 122)</th>
<th>Old Set (n_{4a} = 18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- ripping of threads</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>- slipping of traction device</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>- skin lesions</td>
<td>non</td>
<td>5</td>
</tr>
<tr>
<td>- Luxation of dummy</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>- Dehiszenz Neovagina</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Time of tension (days)</td>
<td>4.6(^*)</td>
<td>7.5(^*)</td>
</tr>
</tbody>
</table>

\(^*p = 0.0001\)

- Infinitely variable and equally tighten of both traction threads
- **no tearing of the neovagina**
Long-time follow up (n=135/152)

Length neovagina

Sexual intercourse

- Functional length
- Anatomical length
- No sexual intercourse
- Sexual intercourse
Du bist nicht alleine!
Conclusion

1. Safe, atraumatic, FDA-approved instruments for laparoscopic-assisted neovagina

2. Optimization due to vagino-abdominale perforation without dissection of vesico-rectale space

3. Optimization due to shorter operation time and time of tension with less complications along with better functional results

http://www.neovagina.de/index.php?lang=en&prt=fach&auth=L3rd6o60Mu8z
Sara.Brucker@med.uni-tuebingen.de
Laparoscopic-assisted Neovagina

S. Brucker
K. Rall
D. Wallwiener

Frauenklinik
Universitäts-
Tübingen
**Results**

- **Vaginal mucosa**: normal in thickness.
- **PAS-reaction**: broad intermediate cell zone with abundant cytoplasmic glycogen and a covering layer of narrow, superficial cells.
- **IH reaction (cytokeratin 13)**: normal epithelial cells, squamos differentiations
McIndoe procedure with mash - graft - transplantation