The Complete Treatment of Pelvic Floor Prolapse by Laparoscopy

R Botchorishvili, A Wattiez, G Mage, M Canis, B Rabischong, K Jardon, C Rivoire, JL Pouly, H Manhes, MA Bruhat

The hidden epidemic of pelvic floor dysfunction: achievable goals for improved prevention and treatment.

DeLancey JO.
Am J Obstet Gynecol. 2005 May;192(5):1488-95

Each year, pelvic floor dysfunction affects between 300,000 and 400,000 American women so severely that they require surgery. Approximately 30% of the operations performed are re-operations. The high prevalence of this problem indicates the need for preventive strategies, and the common occurrence of re-operation indicates the need for improvement.

Long-term follow-up studies in pelvic floor dysfunction: the Holy Grail or a realistic aim?
Importance of fascia: the "hammock" theory
De Lancey, Richardson

"hammock" or "trampoline" theory
De Lancey, Richardson

Paravaginal defect
Importance of fascia: the 'hammock' theory
De Lancey, Richardson

Pubocervical fascia defects that contribute to cystocele
Importance of fascia: the « hammock » theory
De Lancey, Richardson

Rectovaginal fascia
Dénonvilliers

Attachment of the rectovaginal septum to the pelvic sidewall

The rectovaginal fascia supports the posterior compartment analogous to the pubocervical fascia in the anterior compartment.
Young women with genital prolapse have a low collagen concentration.

METHODS: Punch biopsies from the paraurethral ligaments were obtained during the operation from 22 women undergoing surgery for genital prolapse. As controls, similar biopsies were taken from 13 women who underwent gynecologic surgery for other benign reasons. Collagen concentration as hydroxyproline and its extractability by pepsin digestion were studied.

RESULTS: Women, younger than 53 years, with genital prolapse had a 30% lower collagen concentration than age-matched controls, which reached significance, P = 0.01. It did, however, decrease significantly with age in both prolapse patient and control groups. Morphology supported these findings with a less-dense extracellular matrix composition subepithelially in genital prolapse compared to a healthy control.

CONCLUSION: Young women with genital prolapse have a decreased collagen concentration, suggesting a different organization of the endopelvic connective tissue extracellular matrix.

Impact of menopause on collagen subtypes in the arcus tendineous fasciae pelvis
P. A. Moalli MD, PhD, L. C. Talarico BS, V. W. Sung MD, W. L. Klingensmith BS, S. H. Shand BS, L. A. Meyn MD and S. Watkins PhD
Interaction between fascias and muscles

3. Boat in phy-derm concept of pelvic organ prolapse. A. Boat is supported by water (musculature) and held in place by its covering (fascias and ligaments). B. If barrier is removed, the contents are flapping freely. Paramore RH. The uterus as a floating organ. 1918

LA muscles

MRI study
The hidden epidemic of pelvic floor dysfunction: Achievable goals for improved prevention and treatment

John O.L. DeLancey


Functionnal anatomy

Utero-sacral ligaments

The hidden epidemic of pelvic floor dysfunction: Achievable goals for improved prevention and treatment

John O.L. DeLancey


Terminologia Anatomica versus unofficial descriptions and nomenclature of the fasciae and ligaments of the female pelvis: A dissection-based comparative study

Alfredo Ercoli, PhD,a Vincent Delmas, MD,b Francesco Fanfani, MD,c Pierre Gadonneix, MD,d Marcello Ceccaroni, MD,a Anna Fagotti, MD,c Salvatore Mancuso, MD,a Giovanni Scambia, MDc,*

Uterosacral ligament: description of anatomic relationships to optimize surgical safety

Jerome L. Buller MD

“The cervical and intermediate portions of the uterosacral ligaments supported more than 15 kg of weight before failure.”
The role of apical vaginal support in the appearance of anterior and posterior vaginal prolapse.


When the POP-Q examination is performed with simulated apical support, the critical role of level I vaginal support on the position of the anterior and posterior vagina, particularly the anterior vagina, becomes apparent.

Interaction among apical support, levator ani impairment, and anterior vaginal wall prolapse.

Chen L, Ashton-Miller JA, Hsu Y, DeLancey JO.


A biomechanical model of the anterior vaginal wall and its support system.
Origin of prolapse

- FASCIAL DEFECTS
- LIGAMENTS IMPAIRMENT
- MUSCLES IMPAIRMENT

Uterosacral ligament in postmenopausal women with or without pelvic organ prolapse. Gabriel B and all. Int Urogynecol J Pelvic Floor Dysfunct. 2005 Nov-Dec;16(6):475-9

Pelvic Diaphragm of Female Superior View
Posterior suspension to the lumbo-sacral disk; abdominal method of replacement of the utero-sacral ligaments.

[La suspension postérieure au disque lombo-sacré; technique de remplacement des ligaments utéro-sacrés par voie abdominale]

AMELINE, A; HUGUIER, J
Gynecologie Et Obstetrique
Volume 56, Issue 1, January - March 1957, Pages 94-98

“SCALI” Technique
1974

A. WATTIEZ CLERMONT-FERRAND, 1974,
Neuchot E; Ay, Neuchot F; Neuchot E;
Laparoscopic sacral colpectomy for vaginal vault prolapse
Obstetrics and Gynecology, Volume 94, Issue 2, 1994, Pages 983-988

Interest of laparoscopy

- Possible approach of all compartments
- Possible use of prothesis with minimal risk of complications
- Treatment of incontinence
- And all advantages of laparoscopy
**Technical advantages of laparoscopy**

- **Angle of instruments**
- **Logical** line: eye-instrument-tissue
- **Magnification of vision**
- **Lecture of anatomic plane**
- **Dynamic progression of dissection**
- **Virtualisation of difficulties**
- **Positive pressure**
- **Anatomic defects are opened**
- **Quality of the repair is showed**

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**Anatomy**

- **Vagina**
- **Rectum**
- **levator ani muscles**

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**Sacral promontory**

- **Ligamentum Flavum**
- **Interspinales Ligament**
- **Intervertebrales Ligament**
- **Postarticulares Ligament**
- **Longitudinales Ligament**
- **Anosacral Ligament**
TECHNIQUE OF REFERENCE

Variety of techniques

- STANDARD technique since 1998
- Supracervical hysterectomy
  - if none before, no opening of the vagina
- Vesicovaginal mesh
- Rectovaginal mesh fixed to the LAM
- Promontofixation
- Reziuplastie with mesh
- Burch colposuspension or TVT-O
Abdominal sacrocolpopexy with Burch colposuspension to reduce urinary stress incontinence.


Department of Obstetrics and Gynecology, Loyola University Medical Center, Maywood, Ill, USA.

RESULTS: Of 322 women who underwent randomization, 157 were assigned to Burch colposuspension and 165 to the control group.
Three months after surgery, 23.8 percent of the women in the Burch group and 44.1 percent of the controls met one or more of the criteria for stress incontinence (P<0.001).

There was no significant difference between the Burch group and the control group in the frequency of urge incontinence (32.7 percent vs. 38.4 percent, P=0.48).

After surgery, women in the control group were more likely to report bothersome symptoms of stress incontinence than those in the Burch group who had stress incontinence (24.5 percent vs. 6.1 percent, P<0.001).

CONCLUSIONS: In women without stress incontinence who are undergoing abdominal sacrocolpopexy for prolapse, Burch colposuspension significantly reduced postoperative symptoms of stress incontinence without increasing other lower urinary tract symptoms.
LAPAROSCOPIC PROMONTOFIXATION
Experience of CLERMONT-FERRAND

- Retrospective study
  01/01/1995 - 31/03/2006
- 271 patients operated
- 228 patientes studied
- Mean follow up - 25 months (1 - 11 years)
- 43 lost

Results
serie of Clermont-Ferrand

271 patients operated
228 patientes studied
Mean follow up - 25 months (1 - 11 years)
43 lost
RECURRENCE
20 PATIENTS

- Surgeon dependent, variable from 4% to 15%
- No risk factors clearly identified
- Risk factors:
  - Uterine conservation?
  - Absence of the anterior reparation: PVR, Retziuplasty?
  - Absence of the fixation to the LAM?
  - ?

TREATMENT OF THE RECURRENCE

- Possible by laparoscopy in the majority of cases
- Putting the mesh under tension, shortening
- Reattachment to the promontory
- Completing the treatment: PVR, Retziuplasty, fixation to the LAM
- Hysterectomy+++ 

Anterior prolapse
131 patients - standard technique

<table>
<thead>
<tr>
<th></th>
<th>Pre-operative</th>
<th>1 month post-op</th>
<th>Long-term 1 to 6 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>C0</td>
<td>2 (18)</td>
<td>102 (82%)</td>
<td>47 (42%)</td>
</tr>
<tr>
<td>C1</td>
<td>5 (40)</td>
<td>21 (17%)</td>
<td>41 (38%)</td>
</tr>
<tr>
<td>C2</td>
<td>18 (149)</td>
<td>4 (3%)</td>
<td>12 (118)</td>
</tr>
<tr>
<td>C3</td>
<td>62 (478)</td>
<td>0</td>
<td>7 (68)</td>
</tr>
<tr>
<td>C4</td>
<td>44 (349)</td>
<td>0</td>
<td>1 (18)</td>
</tr>
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</table>
### Apical prolapse
131 patients - standard technique

<table>
<thead>
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<th>Pre-operative</th>
<th>1 month post-op</th>
<th>long term (1 to 6 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-V0</td>
<td>1 (1%)</td>
<td>113 (89%)</td>
<td>80 (74%)</td>
</tr>
<tr>
<td>H-V1</td>
<td>3 (2%)</td>
<td>10 (8%)</td>
<td>14 (13%)</td>
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<tr>
<td>H-V2</td>
<td>40 (31%)</td>
<td>5 (2%)</td>
<td>8 (7%)</td>
</tr>
<tr>
<td>H-V3</td>
<td>62 (47%)</td>
<td>1 (1%)</td>
<td>6 (5%)</td>
</tr>
<tr>
<td>H-V4</td>
<td>25 (19%)</td>
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<td>0</td>
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</table>

### Posterior prolapse
131 patients - standard technique

<table>
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<tbody>
<tr>
<td>R0</td>
<td>6 (5%)</td>
<td>39 (78%)</td>
<td>71 (66%)</td>
</tr>
<tr>
<td>R1</td>
<td>60 (46%)</td>
<td>26 (20%)</td>
<td>25 (23%)</td>
</tr>
<tr>
<td>R2</td>
<td>36 (27%)</td>
<td>2 (2%)</td>
<td>11 (10%)</td>
</tr>
<tr>
<td>R3</td>
<td>25 (19%)</td>
<td>0</td>
<td>1 (1%)</td>
</tr>
<tr>
<td>R4</td>
<td>4 (3%)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Patients satisfaction

Global satisfaction from operation:

- Very satisfied: 105 (80%)
- Moderately satisfied: 23 (18%)
- Non satisfied: 3 (2%)

Davila GW, Drutz H, Deprest J.

The occurrence of healing abnormalities after graft implantation is becoming increasingly recognized as a potentially serious problem.

As the use of grafts in reconstructive surgery is expanded, surgeons are encouraged to familiarize themselves with currently published data, and determine whether a graft should, or should not be, utilized during a reconstructive procedure, and if so, the type of graft best indicated in each specific clinical situation.

**Mesh erosions**: 14 / 264 (5.3%) 1995-2006

<table>
<thead>
<tr>
<th>Case</th>
<th>Age</th>
<th>Delay</th>
<th>Mesh</th>
<th>Suture</th>
<th>Technique</th>
<th>Complication</th>
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<tr>
<td>1</td>
<td>56</td>
<td>3</td>
<td>Mersilene</td>
<td>Vicryl</td>
<td>Vaginal cuff, Burch</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>48</td>
<td>5</td>
<td>Mersilene</td>
<td>Vicryl</td>
<td>SCH, Burch</td>
<td>-</td>
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<tr>
<td>3</td>
<td>57</td>
<td>1</td>
<td>Mersilene</td>
<td>Ethibond</td>
<td>Vaginal cuff, Burch</td>
<td>vaginal perf</td>
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<tr>
<td>4</td>
<td>48</td>
<td>4</td>
<td>Mersilene</td>
<td>Ethibond</td>
<td>SCH, Burch</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>50</td>
<td>11</td>
<td>Mersilene</td>
<td>Vicryl/Ethibond</td>
<td>TH</td>
<td>-</td>
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<tr>
<td>6</td>
<td>57</td>
<td>17</td>
<td>Mersilene</td>
<td>Vicryl/Ethibond</td>
<td>TH, Burch</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>64</td>
<td>22</td>
<td>Mersilene</td>
<td>Vicryl/Ethibond</td>
<td>TH, Burch</td>
<td>-</td>
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<tr>
<td>8</td>
<td>58</td>
<td>1</td>
<td>Surgipromesh</td>
<td>Ethibond</td>
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<td>vaginal perf</td>
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<td>9</td>
<td>57</td>
<td>1</td>
<td>Mersilene</td>
<td>Ethibond</td>
<td>TH, Burch</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>61</td>
<td>54</td>
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<td>Ethibond</td>
<td>SCH/Burch</td>
<td>-</td>
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<tr>
<td>11</td>
<td>50</td>
<td>12</td>
<td>Polyester</td>
<td>Vicryl/Ethibond</td>
<td>TH, Burch</td>
<td>-</td>
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<tr>
<td>12</td>
<td>54</td>
<td>57</td>
<td>Polyester</td>
<td>Vicryl/Ethibond</td>
<td>TH, Burch</td>
<td>-</td>
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</table>

### Mesh erosions : 14 / 264 (5.3%) 1995-2006

<table>
<thead>
<tr>
<th>No.</th>
<th>Month</th>
<th>Treatments, treatment route, N of attempts</th>
<th>N° total</th>
<th>Prostate erosion</th>
<th>N° visible</th>
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<tbody>
<tr>
<td>1</td>
<td>N</td>
<td>Resection+suture Vaginaly (1), Complete ablation Laparosc (1)</td>
<td>3</td>
<td>N° visible</td>
<td>3/10</td>
</tr>
<tr>
<td>2</td>
<td>N</td>
<td>Resection+suture Vaginaly (1)</td>
<td>5</td>
<td></td>
<td>5/10</td>
</tr>
<tr>
<td>3</td>
<td>N</td>
<td>Abt part Laparosc (1), Abt comp Laparosc+Vag (1), suture Vag (2)</td>
<td>4</td>
<td></td>
<td>4/10</td>
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<tr>
<td>4</td>
<td>N</td>
<td>Complete ablation, Laparosc (1)</td>
<td>5</td>
<td></td>
<td>5/10</td>
</tr>
<tr>
<td>5</td>
<td>N</td>
<td>Resection+suture Vaginaly (1)</td>
<td>1</td>
<td></td>
<td>1/10</td>
</tr>
<tr>
<td>6</td>
<td>N</td>
<td>Resection+suture Vaginaly (1), Complete ablation Laparosc (1)</td>
<td>5</td>
<td></td>
<td>5/10</td>
</tr>
<tr>
<td>7</td>
<td>N</td>
<td>Resection+suture Vaginaly (1), Complete ablation Laparosc (1)</td>
<td>5</td>
<td></td>
<td>5/10</td>
</tr>
<tr>
<td>8</td>
<td>N</td>
<td>Resected Vag (2), Abt part Laparosc (1), Abt comp Vaginaly (1)</td>
<td>5</td>
<td></td>
<td>5/10</td>
</tr>
<tr>
<td>9</td>
<td>N</td>
<td>Resected Vag (3), Abt part Laparosc (1), Abt comp Vaginaly (1)</td>
<td>5</td>
<td></td>
<td>5/10</td>
</tr>
<tr>
<td>10</td>
<td>N</td>
<td>Resected Vag (3), Abt part Laparosc (1), Abt comp Vaginaly (1)</td>
<td>5</td>
<td></td>
<td>5/10</td>
</tr>
<tr>
<td>11</td>
<td>N</td>
<td>Resected Vag (3), Abt part Laparosc (1), Abt comp Vaginaly (1)</td>
<td>5</td>
<td></td>
<td>5/10</td>
</tr>
<tr>
<td>12</td>
<td>N</td>
<td>Resected Vag (4), Abt part Laparosc (1), Abt comp Vaginaly (1)</td>
<td>5</td>
<td></td>
<td>5/10</td>
</tr>
<tr>
<td>13</td>
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<td>Resected Vag (4), Abt part Laparosc (1), Abt comp Vaginaly (1)</td>
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<tr>
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<td>Abt part Vag (2), Abl part Laparosc (1), Abl part Vaginaly (1)</td>
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<td></td>
<td>2/20</td>
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<tr>
<td>15</td>
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<td>2/20</td>
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<td>16</td>
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<td>2/20</td>
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<tr>
<td>17</td>
<td>N</td>
<td>Abt part Vag (2), Abl part Laparosc (1), Abl part Vaginaly (1)</td>
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<td></td>
<td>2/20</td>
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<tr>
<td>18</td>
<td>N</td>
<td>Simple Suture Vaginaly (1)</td>
<td>1/44</td>
<td>21%</td>
<td>1/44</td>
</tr>
</tbody>
</table>

### Synthetic grafts: Porosity

- **Fibroblastes 20-50 nm**
- **Microbes 9-15 nm**
- **Macrofages 16-25 nm**
- **Threshold of 75 micrometres**
- **Threshold of 10 micrometres**
- **Synthetic grafts: Porosity**

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12/01/2016

Impact of hospital and surgeon volumes on outcomes following pelvic reconstructive surgery in the United States.

Sung VW, Rogers ML, Myers DL, Clark MA.

OBJECTIVE: to estimate the effect of hospital and surgeon volumes on outcomes following urogynecologic surgery.

STUDY DESIGN: retrospective cohort study of women who underwent urogynecologic procedures between 1998 and 2003 from the Nationwide Inpatient Sample.

RESULTS: There were 310,759 women and 2986 hospitals. Women who had procedures at low-volume hospitals were 2.75 (95% CI 2.33-3.16) times more likely to die and 1.63 (95% CI 1.44-1.83) times more likely to have a nonroutine discharge, compared to those at high-volume hospitals.

<table>
<thead>
<tr>
<th>HOSPITAL VOLUME</th>
<th>SURGEON VOLUME</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW &lt;92</td>
<td>&lt;8</td>
</tr>
<tr>
<td>MEDIUM 92-185</td>
<td>8-18</td>
</tr>
<tr>
<td>HIGH &gt;185</td>
<td>&gt;18</td>
</tr>
</tbody>
</table>


Is not the position you stand, but the direction in which you look

S U C C E S S

Laparoscopic treatment of genital prolapse:
- is feasible, effective and reproducible with a small rate of complications after an adequate learning,
- give excellent anatomical results,
- should be applied with para-vaginal prosthetic reparation and routinely associated with a surgical treatment for stress incontinence
- Knowledge of retroperitoneal anatomy, ergonomic rules and laparoscopic sutures is mandatory