Applications of robot assisted surgery in gynecology

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Robotiv surgery =
laparoscopic surgery with a sophisticated tool

Most applications are scientifically well established concerning safety and oncological outcome (trad. laparoscopy)

Advanced traditional laparoscopy has not been generally implemented

Robot VS traditional laparoscopy remains controversial

Economic data comparing robot with traditional laparoscopy and laparotomy are missing
A+B = Da Vinci standard

B+C = Da Vinci S

C+D = Da Vinci SI

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The robotic phases

1

The initial enthusiasm

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The robotic phases

2

Frustration

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The robotic phases

3
Learning phase
The robotic phases

4

Confident innovative phase
Requirements for a successful robotic programme

>=350 procedures / year / robot

>=50 procedures / doctor / year.

>=100-200 procedures / speciality-team / year

Dedicated team

2-4 doctors

3-4 OR nurses + 3-4 circ nurses

Dedicated anesthesia teams
History of laparoscopic surgery in Lund

1992  First videolaparoscopy equipment
1994  Burch, LAVH
1995  LASH
1996  Total laparoscopic hyst
1996  Vaginosacropexia
2000  Pelvic lymphadenectomy
2002  Paraaortic lymphadenectomy
2005  Radical hysterectomy
October 2005  robotassisted laparoscopy
April 2007  robot nr 2
Prospective protocol all robot patients

Clinical data
Surgical / perioperative/
Postoperative 2 months
Postoperative one year

+ 

Personal identification number / computerized patients files
Scheduled follow up 5 years / clinical Protocol

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Robotic procedures for selected benign disorders

- Simple hysterectomy +/- adnex
- Enucleation of myomas
- Vaginal cuff endometriosis/endometriomas
- Abdominal cervical cerclage
- Suture of post cesarean dehiscence
- Hemihysterectomy/malformation
- Scar pregnancy
- Cystoma during pregnancy
- Vaginosacropexia
- Adhesolysis frozen pelvis
**Cervical cancer**

Case load 50 /year

**Endometrial cancer**

With new treatment programme estimated case load 100/year

**Ovarian cancer**

Case load 20-30 per year.
Robot assisted laparoscopic radical hysterectomy and pelvic lymphadenectomy with short and long term morbidity data

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ABSTRACT

Objective. To evaluate feasibility and morbidity of robot assisted laparoscopic radical hysterectomy.

Methods. From December 2005 to September 2008 robot assisted laparoscopic radical hysterectomy and pelvic lymphadenectomy was performed on 80 women. Using a prospective protocol, and an active investigation policy for defined adverse events, perioperative, short and long term data were obtained.

Results. Time for surgery (skin to skin) reached 176 and 132 min after 9 and 34 procedures respectively. All tumours were radically removed. Median number of retrieved lymph nodes was 26 (range 15–55). All women had an early follow up (1–3 months) and 43 of eligible 46 women (93%) had a long term follow up (≥12 months). In 33 of 80 women (41%) the peri/postoperative period was uneventful. The remainder had one or more mainly mild adverse events, most commonly from the vaginal cuff (n = 17, 21%) or the lymphatic system (n = 16, 20%). The proportion of uneventful cases increased significantly over time. Five women were resutured for dehiscence of the vaginal cuff, two women were reoperated for trocar site hernias and one woman had a ureter stricture that resolved following stent treatment. Eight women (14%) needed 60 days or more to resume spontaneous voiding. One 72-year old woman with disseminated endometrial cancer on autopsy died of pulmonary embolism 31 days after surgery.

Conclusions. Robot assisted laparoscopic radical hysterectomy is a feasible alternative to conventional laparoscopy and open surgery. Effort should be made to ensure proper closure of the vaginal cuff, trocar sites and to develop nerve sparing techniques.

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Robotic radical hysterectomies
First 131 cases

Cervical cancer
- 1a2, n = 16
  * Aborted due to pos SN = 0
  * Postop chemorad = 0
- 1b1, n = 76
  * Aborted due to pos SN = 10
  * Postop chemorad = 26

Endometrial cancer
- 2a, n = 9
  * Aborted due to pos SN = 1
  * Postop chemorad = 7

Sarcoma, n = 1

Conversions = 4
- 2 Anesth problems
- 1 Omental met
- 1 System error

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surgical time (skin-to-skin) for robot-assisted radical hysterectomy and pelvic LND

Last 20 procedures:
Median time 162 minutes
(range 132-232 minutes)

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Robot assisted radical hysterectomy+pelvic LND

Postoperative and follow up data

111 women with >=1 month follow up

61 uneventful

11 Re-admissions
Hernia (2)
Vaginal cuff dehiscence (5)
Hematoma (2)
Ureter stricture (1)
Chylusscites (1)

39 Minor/ moderate adverse events
Vaginal cuff infection
Lymfoedema
Abd wall
other

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Lymphatic adverse effects after robot assisted radical hysterectomy and pelvic LND

17/111 proximal lymphoedema
8/111 lymphocele
1/111 chylusascites
6/50 distal lymphoedema (postop radiotherapy)
2/61 distal lymphoedema (no radiotherapy)
Chylusascites following Robot assisted radical hysterectomy and pelvic LND

65 yo    stage 1B1  sq. ep   cervical cancer

Surgery january 2009

Radical surgery, 44 negative pelvic nodes

No postop adjuvant treatment

Gradually developed chylus ascites

Benign cytology

Normal CT abd/ thorax

Normal HB, WBC/ diff, Trc

Resolved by treatment with Sandostatin and fat-reduced / MCT diet

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Abdominal wall adverse effects after robot assisted radical hysterectomy and pelvic LND

4/111 port site hernia (3 reop)
1/111 muscle rupture
3/111 hematoma
1/111 port site metastase

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Lymphatic mapping during robot assisted surgery for cervical cancer

Four point submucosal injection of 120 MBc radiotracer (~3 pm)

One hour lymphoscintigram

Surgery as first case the following morning

Laparoscopic gamma-probe

SN for frozen section

Full pelvic LND

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Trachelectomy: Fertility-Sparing in Cervical Cancer

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Trachelectomy: Fertility-Sparing in Cervical Cancer

The pioneer in memoriam!

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Radical trachelectomy

900 cases published (Shepherd 2008)

760 of the cases are vaginal trachelectomy with laparoscopic pelvic LND (Shepherd 2008)

43% attempt pregnancy; 70% pregnancy rate (Ramirez 2008)

>45% of women <40yo with operable cancer theoretically suitable for fertility sparing surgery (Sonoda 2008)
### Robotic trachelectomies, publications

<table>
<thead>
<tr>
<th></th>
<th>Published Cases n</th>
<th>Tumor stage</th>
<th>Op time</th>
<th>Bleeding mL</th>
<th>Uterine Artery</th>
<th>Cerclage</th>
</tr>
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<tbody>
<tr>
<td>Persson et al.</td>
<td>2</td>
<td>1b1 1A2</td>
<td>387</td>
<td>100 / 150</td>
<td>spared</td>
<td>yes</td>
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<tr>
<td>Geisler et al.</td>
<td>1</td>
<td>1B1 Adenosarc</td>
<td>172</td>
<td>100</td>
<td>sacrificed</td>
<td>yes</td>
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<tr>
<td>Chuang et al.</td>
<td>1</td>
<td>1A2</td>
<td>345</td>
<td>200</td>
<td>sacrificed</td>
<td>yes</td>
</tr>
</tbody>
</table>

**Persson J, Kannisto P, Bossmar T.**


**Chuang LT, Lerner DL, Liu CS, Nezhat FR.**
Position of cervical cerclage and length of the remaining cervix

11 mm
# Trachelectomy Pros and cons, personal view

<table>
<thead>
<tr>
<th></th>
<th>Vaginal trachelectomy</th>
<th>Robotic trachelectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Documentation</strong></td>
<td>+++</td>
<td>0 (+)</td>
</tr>
<tr>
<td><strong>Adoption of technique</strong></td>
<td>+/-</td>
<td>++</td>
</tr>
<tr>
<td><strong>Tailoring of parametrial dissection</strong></td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Allowing nervesparing dissection</strong></td>
<td>-</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Conversion to Radical hysterectomy</strong></td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Surgical time</strong></td>
<td>++</td>
<td>-?</td>
</tr>
<tr>
<td><strong>Control of cervical transsection point</strong></td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Placement of cerclage / risk of rejection / erosion</strong></td>
<td>-</td>
<td>++?</td>
</tr>
</tbody>
</table>
Recent aims

Further reduction of set up and turnover times

Further reduction of consol time

3 operations / day

Minimize number and size of ports

Minimize number of instruments

Further improve perioperative care

Increase research activity

Side docking
Publications on robot assisted surgery.


Lonnerfors C, Persson J. Applications of robot assisted surgery in a mixed gynecological and gynneoncological unit. In abstract
Studyvisits and/or proctorings

Planned visits
2:nd European Symposium on Robotic Gynaecological surgery

September 2010 Lund Sweden

www.sergs2010.org
Practicum Robotic School
Lund University hospital
In collaboration with
Intuitive surgical

Training robot
Porcine model
Team training/ preparation/ set up
case observations on demand

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Thank You for Your attention

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