Didactic/Porcine Lab: Expanding the Surgical Toolbox: Incorporating Advanced Minimally Invasive Approaches into Your Practice

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Professional Education Information

Target Audience
This educational activity is developed to meet the needs of surgical gynecologists in practice and in training, as well as other healthcare professionals in the field of gynecology.

Accreditation
AAGL is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The AAGL designates this live activity for a maximum of 3.75 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

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LESS-708: Didactic/Porcine Lab: Expanding the Surgical Toolbox: Incorporating Advanced Minimally Invasive Approaches into Your Practice

Edward J. Tanner, Chair

Faculty: Devin M. Garza, Xiaoming Guan, Tae Joong Kim, Kimberly L. Levinson, Peter C.W. Lim, Stacey A. Scheib, Abdulrahman K. Sinno, R. Scott Walker

This course provides experienced minimally invasive surgeons with an opportunity to expand the range of tools available to perform minimally invasive procedures. While multiport laparoscopy and robotics may be adequate for most circumstances, a variety of new approaches can now be employed to improve outcomes. How will a surgeon know when to “make the leap” to these new approaches? Innovative surgical techniques including single port laparoscopy, single port robotics, micro-laparoscopy, 3D video laparoscopy, and mini-laparotomy will be evaluated by participants in a porcine lab. Experienced instructors will provide guidance on port placement, micro-laparoscopy instrumentation, single port laparoscopic/robotic suturing, and retroperitoneal dissection. Didactics will focus on the selection of appropriate patients for each approach and “tips and tricks” to help surgeons incorporate these techniques into their practice.

Learning Objectives: At the conclusion of this course, the clinician will be able to: 1) Identify situations where innovative surgical approaches (single port laparoscopy/robotics, micro-laparoscopy, 3D video laparoscopy, and mini-laparotomy) can be added to standard laparoscopic or robotic techniques to improve patient outcomes; 2) demonstrate techniques for suturing using innovative surgical approaches; and 3) apply techniques to maximize utilization of innovative surgical approaches in complex or difficult cases.

Course Outline

12:30 Welcome, Introductions and Course Overview
E.J. Tanner

12:35 Matching Patients with Procedures: How to Incorporate Innovative Minimally Invasive Surgical Techniques into Your Practice
S.A. Scheib

1:00 LAB I: Single Port Laparoscopy, Micro-laparoscopy, Minilap, and 3D Video Laparoscopy Techniques
X. Guan, T.J. Kim, K.L. Levinson, S.A. Scheib, A.K. Sinno

- Abdominal Entry, Single Port Placement, Micro-laparoscopy, Trocar Placement
- Porcine Hysterectomy Procedure
- Single Port Laparoscopic Techniques
- Evaluation of 3D Video Laparoscopy Technology

2:25 Conquering the Tough Case: Tips and Tricks to Expand the Boundaries of Single Port Laparoscopy
T.J. Kim

2:50 LAB II: Single Port Robotic Techniques
D.M Garza, P.C.W. Lim, E.J. Tanner, R.S. Walker

- Abdominal Entry, Robotic Single Port Placement
- Porcine Hysterectomy Procedure
- Single Port Robotic Suturing Techniques
- Retroperitoneal Dissection/Ureterolysis

4:15 Questions & Answers
All Faculty

4:30 Adjourn
PLANNER DISCLOSURE
The following members of AAGL have been involved in the educational planning of this workshop (listed in alphabetical order by last name).
Art Arellano, Professional Education Manager, AAGL*
R. Edward Betcher*
Amber Bradshaw
Speakers Bureau: Myriad Genetics Lab
Other: Proctor: Intuitive Surgical
Sarah L. Cohen
Consultant: Olympus
Erica Dun*
Joseph (Jay) L. Hudgens
Contracted Research: Gynesonics
Frank D. Loffer, Medical Director, AAGL*
Suketu Mansuria
Speakers Bureau: Covidien
Linda Michels, Executive Director, AAGL*
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Kevin J.E. Stepp
Consultant: CONMED Corporation, Teleflex
Stock Ownership: Titan Medical
Karen C. Wang*

FACULTY DISCLOSURE
The following have agreed to provide verbal disclosure of their relationships prior to their presentations. They have also agreed to support their presentations and clinical recommendations with the “best available evidence” from medical literature (in alphabetical order by last name).
Devin M. Garza
Consultant: Applied Medical, Boston Scientific Corp., Inc.
Speakers Bureau: Intuitive Surgical
Xiaoming Guan
Consultant: Applied Medical
Tae Joong Kim
Speakers Bureau: Johnson & Johnson
Kimberly L. Levinson*
Peter C.W. Lim*
Stacey A. Scheib*
Abdulrahman K. Sinno*
Edward J. Tanner*
W. Scott Walker*
Content Reviewer has no relationships.

Asterisk (*) denotes no financial relationships to disclose.
Matching Patients with Procedures: How to Incorporate Innovative Minimally Invasive Techniques into Your Practice

Stacey A. Scheib, MD, FACOG
Director of Minimally Invasive Gynecology
Director of the Multidisciplinary Fibroid Center

Disclosures

I have no financial relationships to disclose.

Objectives

• Explain the theory and rationale behind single port laparoscopy, reduced port laparoscopy, micro-laparoscopy, mini-laparotomy, 3D technology
• Identify the limitations of single port laparoscopy, reduced port laparoscopy, micro-laparoscopy, mini-laparotomy, 3D technology

SINGLE INCISION AND REDUCED PORT LAPAROSCOPY

Background

• Gynecology has been at the forefront of single site surgery starting more than 40 years ago.
  – The offset operating laparoscope used for laparoscopic tubal ligations,1,2
  – The first complex procedure, a hysterectomy and bilateral salpingo-oophorectomy was performed by Pelosi and Pelosi in 1991, without additional trocharss.3

Despite these early efforts, single site surgery did not become a standard surgical technique in gynecologic surgery for several reasons and is now only taken off due to advances in technology.


Disadvantages

• Restricted by a surgeon's experience with advanced laparoscopy.
  – Loss of triangulation
  – Special instrumentation
  – Learning curve
Morbidity

- Each additional port used potentially increases morbidity\(^4,5\)
  - Bleeding
  - Port-site hernia
  - Internal organ injury
  - Vascular injury
  - Post-operative wound infection
  - Decreases cosmetic outcome


Pain

- Potential decrease in postoperative pain and need for postoperative pain medications, which might be due to avoidance of multiple muscle-splitting incisions.\(^4,6-8\)


Gynecology and Single Incision

- Anatomy of the Pelvis
- Ease of Specimen Removal

Just Remember

- Follow standard laparoscopic fundamentals
  (LESS and reduced port laparoscopy are ACCESS techniques...NOT new procedures)
- Includes using all normal precautionary steps such as identifying and isolating ureters, bladder, and bowel

What will you need to get started?

- Port
- Laparoscope – Angled or Flexible Tip
- Instruments – Traditional Straights
- Energy – Anything but ultrasonic technology
- Uterine Manipulator

Initial Patient Selection

- BMI < 40
- Uterus 14 weeks or less
- No more than 1 prior abdominal surgery
- No prior history of pelvic inflammatory disease (PID)
Putting in the Port

Cross Over Technique

• Grasper goes in contralateral trocar from the direction of retraction

• If you are clashing instruments, most likely instruments are in the wrong trocars... pull everything out and reassess

• Set yourself up to be successful... camera, then grasper, and finally energy

Cross Energy Above or Below the Grasper?

ABOVE
• Round ligament
• Bladder flap
• Colpotomy
• Cervical amputation

BELOW
• Infundibulopelvic ligament
• Utero-ovarian ligament
• Fallopian tube
• Round Ligament
• Uterine artery
• Colpotomy
• Cervical amputation

Guiding Principles

• Always retract in such a way that the handle of the instrument moves lateral, away from the camera and central are above the umbilicus

• Plan the procedure and choose instrumentation and techniques that minimize the need for instrument exchanges

• Use a good uterine manipulator

• If significant difficulty is encountered at any time during the procedure, an additional trocar can always be considered

Seeing the Principles in Action

Worst Case Scenario

• Add another trocar!!!
**Cuff Closure**

- Vaginal closure
- Laparoscopic suturing device with an articulating laparoscopic grasper
- Vertical laparoscopic closure with a "puppet string" at 12 o’clock (advanced single incision laparoscopic technique)

**Umbilical Closure**

- Close the fascia
- May need to stitch base of umbilicus down to fascia
- Subcutaneous stitch to reapproximate skin
- Discourage use of skin glue

**Single Site Robotics (R-LESS)**

- May make LESS more accessible to the general gynecologist
- Limited instrumentation and energy options

**Endometriosis**

- Advanced LESS skill set
- May need articulating instruments

**Myomectomy**

**Pregnancy**


MICRO-LAPAROSCOPY

Micro-Laparoscopy

• 3mm or less incisions
• Pain mapping
• Can be used with benign GYN pathology, urogyn procedures, REI, and gyn oncology


Advantages

• Less pain
• Lower consumption of analgesics
• Quicker return to daily activities
• Postoperative recovery time
• Reduced healthcare costs
• Improved cosmesis
• Decreased in trocar site hernias


Limitations

• Light and picture quality is reduced
• Delicate nature of the graspers, scissors and other instrumentation, and difficult in removing bulky tissue through the smaller trocars
• Learning curve related to the above


Video

MINI-LAPAROTOMY
**Somewhere in Between**

- Can be combined with laparoscopy
- Equivalent to laparoscopy for reproductive outcomes with shorter operative times\(^3\)
- Shorter hospital times compared to laparotomy but worse than laparoscopy\(^2,4\)
- Pain better than laparotomy but equivalent than laparoscopy\(^2,5\)


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**3D TECHNOLOGY**

**Benefits**

- Helps shorten the learning time of basic laparoscopic skills to novices\(^2,7\)
- Appears to improve speed and reduce the number of performance errors when compared to 2D laparoscopy\(^8\)
- Operation time is reduced and procedural error margin is decreased\(^2,8\)


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**Limitations**

- More expensive
- Having the obligation to wear glasses
- Big and heavy camera probe
- Headaches and dizziness


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**Take Home**

- These are techniques…NOT new procedures
- Expect every step to take more thought and concentration
- Be aware of a tendency to accept less anatomic visualization than conventional laparoscopic and don’t accept this…**Patient Safety First!**
- If it is necessary, place an additional trocar

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**References**

References

Conquering the Tough Case: Tips and Tricks to Expand the **Boundaries** of Single Port Laparoscopy

Tae Joong Kim, MD., PhD.

Assistant Professor
Division of Gynecologic Oncology
Department of Ob/Gyn
Sungkyunkwan Univ. School of Medicine

**Disclosure**

- Speakers Bureau: Johnson & Johnson

**Objectives**

Discuss how to incorporate single port laparoscopy into your practice.

Less scar and more convenience

1808 cases of LESS experiences

May 2008 ~ Aug 2016

- Hysterectomy
- Adnexectomy
- Ovarian cystectomy
- Myomectomy
- Staging c LND
- Others

I started Single-port LAVH using the home-made glove port and an Endo GIA roticator™ on May 2008.
Single port access laparoscopic adnexal surgery
Kim TJ, Lee YY, JMIG, 2009

Ergonomics for gynecologic surgeons

Poor ergonomics in gynecologic surgery
One articulating instrument

My posture & OR set up (29 Oct 2015)

Cuff closure

Use fixator and gravity

SPA ovarian cystectomy using a fixator

Gravity

TJ Kim
“Barb” for traction or fixation

Retroperitoneal dissection

[Image]

Is LESS Retroperitoneal Hysterectomy Feasible? : Surgical Outcomes of Initial 27 Cases

27 consecutive patients (Sep 2012~Feb 2013)

Kim TH, Kim TJ, TJOG 2015

| Operation time (min) | 84 (67.0-95.6) |
| Uterine weight (g)   | 325.0 (153-486) |
| EBL (mL)             | 150 (100-350)   |
| Hb change (g/dL)     | 1.6 (0.9-3.0)   |
| Transfusion          | 1 (3.7%)        |

Uterine arteries ligation

Right       8 (5-12)
Left        8 (5-10)

RPD

Uterine a. ligation
Ureterolysis
LN dissection

1. Pull IP lig.
2. Open broad lig.
3. Find ureter near the pelvic brim
4. Journey following the ureter
5. Develop pararectal space
6. Meet uterine artery
7. Develop paravesical space
8. Skeletonize and ligate uterine a.

Kim TH, Kim TJ, TJOG 2015
Retroperitoneal Approach in Single-Port Laparoscopic Hysterectomy

Kim TH, Kim TJ, JSLS 2016

Comparison (Nov 2011~Aug 2012) vs. 36 rH (Sep 2012~May 2013)

<table>
<thead>
<tr>
<th>Operative time (min)</th>
<th>93 (53-165)</th>
<th>75 (35-152)</th>
<th>&lt;0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterine weight (g)</td>
<td>328 (59-1054)</td>
<td>328 (102-1200)</td>
<td>0.74</td>
</tr>
<tr>
<td>EBL (mL)</td>
<td>200 (30-700)</td>
<td>100 (50-800)</td>
<td>0.023</td>
</tr>
<tr>
<td>Change in hemoglobin (g/dL)</td>
<td>2.25 (-2.0-5.0)</td>
<td>1.85 (-4.3-5.0)</td>
<td>0.256</td>
</tr>
<tr>
<td>Transfusion</td>
<td>0</td>
<td>1 (2.8%)</td>
<td>&gt;0.95</td>
</tr>
</tbody>
</table>

My SPA-rH

<table>
<thead>
<tr>
<th></th>
<th>2012 (n=12)</th>
<th>2013 (n=28)</th>
<th>2014 (n=60)</th>
<th>2015 (n=?)</th>
<th>2016 (n=?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rt. RP UAL</td>
<td>9m17s</td>
<td>6m28s</td>
<td>4m41s</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Lt. RP UAL</td>
<td>8m28s</td>
<td>6m19s</td>
<td>4m24s</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Total OP time</td>
<td>91m26s</td>
<td>77m4s</td>
<td>56m29s</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

My RPD for benign disease

Hysterectomy d/t adenomyosis
Hysterectomy d/t myoma in the lower body
Hysterectomy d/t huge myoma

Myomectomy in women who have finished child
Non-touching oophorectomy

LESS/SPA in oncology

Kim TH, Kim TJ, JSLS 2016
Angle of approach
parallel to iliac vessels and psoas muscle

Benefits of LESS/SPA
**Benefits**

Less scar & SPA!  
Using a bigger opening  
- Minilaparotomy  
- Easier specimen out  
- Wound protection  
Efficient approach to all directions

* May 2008, SPA-LAVH d/t a home-made glove port and an Endo GIA roticulator  
* Nov 2008, SPA-Cystectomy or oophorectomy for larger size d/t articulating grasper  
* Jan 2009, SPA-6H, SPA-M d/t transcervical or transumbilical morcellation  
* May 2010, SPA-staging operating including LND  
* Oct 2010, SPA-TLH (below suture) d/t advanced bipolar device  
* Sep 2012, SPA-TLH thru retroperitoneal dissection  
* Jul 2013, SPA-TLH (above suture) d/t barbed suture  
* Jun 2015, SPA-high paraaortic LND d/t articulating energy device  
* Jun 2016, SPA-triage for advanced ovarian cancer  
* Jun 2016, SPA-radical hysterectomy (type II)  
* Jul 2016, SPA-IDS
Tips and Tricks to Expand the Boundaries of LESS/SPA

✓ Believe in less scar & SPA!
✓ Understand SPA ergonomics
✓ Use a fixator & gravity
✓ Understand ‘approach of angle’ of instruments from umbilicus
✓ Use a bigger umbilical opening

References

CULTURAL AND LINGUISTIC COMPETENCY

Governor Arnold Schwarzenegger signed into law AB 1195 (eff. 7/1/06) requiring local CME providers, such as the AAGL, to assist in enhancing the cultural and linguistic competency of California's physicians (researchers and doctors without patient contact are exempt). This mandate follows the federal Civil Rights Act of 1964, Executive Order 13166 (2000) and the Dymally-Alatorre Bilingual Services Act (1973), all of which recognize, as confirmed by the US Census Bureau, that substantial numbers of patients possess limited English proficiency (LEP).

**California Business & Professions Code §2190.1(c)(3)** requires a review and explanation of the laws identified above so as to fulfill AAGL's obligations pursuant to California law. Additional guidance is provided by the Institute for Medical Quality at [http://www.imq.org](http://www.imq.org).

**Title VI of the Civil Rights Act of 1964** prohibits recipients of federal financial assistance from discriminating against or otherwise excluding individuals on the basis of race, color, or national origin in any of their activities. In 1974, the US Supreme Court recognized LEP individuals as potential victims of national origin discrimination. In all situations, federal agencies are required to assess the number or proportion of LEP individuals in the eligible service population, the frequency with which they come into contact with the program, the importance of the services, and the resources available to the recipient, including the mix of oral and written language services. Additional details may be found in the Department of Justice Policy Guidance Document: Enforcement of Title VI of the Civil Rights Act of 1964 [http://www.usdoj.gov/crt/cor/pubs.htm](http://www.usdoj.gov/crt/cor/pubs.htm).

**Executive Order 13166,”Improving Access to Services for Persons with Limited English Proficiency”,** signed by the President on August 11, 2000 [http://www.usdoj.gov/crt/cor/13166.htm](http://www.usdoj.gov/crt/cor/13166.htm) was the genesis of the Guidance Document mentioned above. The Executive Order requires all federal agencies, including those which provide federal financial assistance, to examine the services they provide, identify any need for services to LEP individuals, and develop and implement a system to provide those services so LEP persons can have meaningful access.

**Dymally-Alatorre Bilingual Services Act** (California Government Code §7290 et seq.) requires every California state agency which either provides information to, or has contact with, the public to provide bilingual interpreters as well as translated materials explaining those services whenever the local agency serves LEP members of a group whose numbers exceed 5% of the general population.

~

If you add staff to assist with LEP patients, confirm their translation skills, not just their language skills. A 2007 Northern California study from Sutter Health confirmed that being bilingual does not guarantee competence as a medical interpreter. [http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2078538](http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2078538).