



Vaginal Surgery under Local Anesthesia

W5, 15 October 2012 09:00 - 12:00

Start	End	Topic	Speakers
09:00	09:10	Introduction	<ul style="list-style-type: none"> • Gunhilde Buchsbaum
09:10	09:40	Vaginal Surgery under local anaesthesia with sedation	<ul style="list-style-type: none"> • Gunhilde Buchsbaum
09:40	10:10	Special considerations for surgery of the elderly and patients with medical conditions	<ul style="list-style-type: none"> • Erin Duecy
10:10	10:30	Cases & Discussion	<ul style="list-style-type: none"> • Gunhilde Buchsbaum • Erin Duecy • Meghan MacRae
10:30	11:00	Break	None
11:00	11:30	Local anaesthetics and sedation	<ul style="list-style-type: none"> • Meghan MacRae
11:30	12:00	Things to do in the operating room	<ul style="list-style-type: none"> • Gunhilde Buchsbaum

Aims of course/workshop

Participants should be able to: • describe how to select and prepare patients for surgery when getting started • understand the pharmacology of local anaesthetics and how to calculate maximal doses • describe the administration of local anaesthetics and the use of nerve blocks • discuss special considerations for surgery under local anaesthesia in the elderly patients and in patients with medical conditions such as COPD or cardiac conditions • list technical considerations when performing vaginal surgery under local anaesthesia • discuss how to cooperate with your anaesthesiologist


Educational Objectives

With increase in elderly patients presenting for surgery and an ever-widening array of techniques for minimally invasive surgery and the cost-effectiveness of outpatient surgery, local anaesthesia with intravenous sedation is becoming increasingly popular. Advantages of local anaesthesia with sedation include minimal interferences with homeostatic mechanisms, and immediate ambulation. Using this technique when performing vaginal reconstructive surgery can reduce anaesthesia side effects and length of hospital stay. Thus, elderly patients and women who have contra-indications to general or regional anaesthesia can be offered an opportunity for procedures performed under local with monitored anaesthesia care. Good communication between the surgeon and the anaesthesia care-provider as well as surgical skills are essential for the procedures to run smoothly. Equally important is detailed pre-operative patient counselling. These aspects of successfully performing vaginal reconstructive procedures under local anaesthesia with sedation will be reviewed.

Vaginal Surgery under Local Anesthesia


ICS 2012 Workshop #252

Gunhilde M. Buchsbaum, MD (Chair) Professor Obstetrics & Gynecology and Urology
Erin E. Ducey, MD Associate Professor Obstetrics & Gynecology and Urology
Meghan Mac Rae, PhD, CRNA Anesthesiology


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Schedule


Start	End	Topic	Speaker
09:00	09:10	Introduction	G. Buchsbaum
09:10	09:40	When to consider vaginal surgery under local anesthesia with sedation	G. Buchsbaum
09:40	10:10	Special considerations for surgery of the elderly and patients with medical conditions	E. Ducey
10:10	10:30	Cases and discussion	All
10:30	11:00	Break	
11:00	11:30	Local anesthetics and sedation	M. MacRae
11:30	12:00	Things to do in the operating room	G. Buchsbaum


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Educational Objectives

Performing vaginal surgery under local anesthesia with sedation may reduce anesthesia side effects and hospital stay. Thus, elderly patients and women who have contra-indications to general or regional anesthesia can be offered an opportunity for procedures performed using these techniques. Good communication between the surgeon and the anesthesia care provider as well as good surgical skills are essential for procedures to run smoothly. Equally important is pre-operative patient counseling.

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Aims of Workshop

Participants should be able to:

- Describe how to select and prepare patients for surgery when getting started
- Understand the pharmacology of local anesthetics and how to calculate maximal doses
- Describe the administration of local anesthetics and the use of nerve blocks
- Discuss special considerations for surgery in the elderly patient and in patients with medical conditions
- List technical considerations when performing vaginal surgery under local anesthesia
- Discuss how to cooperate with the anesthesia care provider

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Vaginal Surgery under
Local Anesthetics with Sedation

Gunhilde M. Buchsbaum , MD
Professor
Obstetrics & Gynecology and Urology

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Background

- 64/10,000 women >65 undergo gynecologic surgery¹
- Increased prevalence of surgery for pelvic organ prolapse²
- US population over age 65 will double by 2050³

¹ Ereksan EA. *Obstet Gynecol.* 2012 Jun;119:1262-1269.
² Bradley SL. *Female Pelvic Med Reconstr Surg.* 2011 Jul;17(4):204-8
³ Centers for Disease Control, National Center for Health Statistics. <http://www.cdc.gov/nchs/data/nhsr/nhsr005.pdf>

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Goals of Surgery for Pelvic Floor Disorders

- Restore function
- Improve quality of life
- Low surgical risks
- Quick recovery time
- Cost effective

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Case #1


97 year old woman with procidentia and urinary retention

PMH

- Dementia
- COPD
- CHF

PSH

- Hip replacement
- Appendectomy



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97 Year Old Woman with Procidentia

➤ Work-up

➤ Testing

➤ Treatment options

- Non-surgical
- Surgical

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**Surgical Treatment of the Elderly
with Pelvic Organ Prolapse**

➤ LeFort colpocleisis under local anesthesia with sedation

- Bilateral pudendal block
- EBL 100cc
- Operating time 70 minutes

➤ Hospital stay over night

➤ No post op pain medication

➤ No perioperative complications

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Local Anesthesia with Sedation versus General Anesthesia

- Minimal interference with homeostatic mechanisms
- Less nausea
- Faster recovery time
- Immediate ambulation
- Immediate oral intake

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Case #2

72 year old woman with post hysterectomy pelvic organ prolapse and stress urinary incontinence

- PMH
 - Obesity (BMI 38 kg/m²)
 - Asthma
 - Diabetes
- PSH
 - TAH-BSO
 - Abdominal hernia repair




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72 Year Old Woman with Post Hysterectomy Pelvic Organ Prolapse and Stress Urinary Incontinence

- Work-up
- Testing
- Treatment options
 - Non-surgical
 - Surgical

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Surgical Treatment of the Postmenopausal Woman with Pelvic Organ Prolapse and Urinary Incontinence

- Sacrospinous ligament suspension with anterior and posterior colporrhaphy
- Placement of TVT
 - Bilateral pudendal block and local infiltration of lidocaine
 - EBL 50cc
 - Operating time 130 minutes
- Hospital stay over night
- No perioperative complications

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Local Anesthesia with Sedation in Pelvic Reconstructive Surgery

Author/Year	Procedures	N
Miklos J, 1995	A&P repair, colpocleisis	20
Ulmsten U, 1996	TVT	75
Jomaa M, 2000	TVT and A&P repair	32
Moore R, 2003	colpocleisis	30
Buchsbaum G, 2005	A&P repair, enterocele repair colpocleisis +/- TVT	98
Buchsbaum G, 2007	SSLS, PVD repair +/- enterocele, A&P repair, TVT	17
Flam F, 2007	Vaginal mesh repair	55
Segal J, 2007	A&P repair, colpocleisis	21

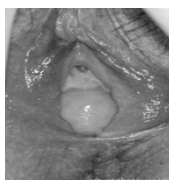
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Case #3

49 year old woman with enterocele, rectocele and stress urinary incontinence

- PMH
 - Hypercholesterolemia
- PSH
 - Tubuligation



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49 Year Old Woman with Enterocele, Rectocele and Stress Urinary Incontinence

- Enterocele and rectocele repair with dermal allograft reinforcement
- Placement of TVT
 - Local with sedation
 - EBL 30cc
- Discharged on day of surgery
- No perioperative complications

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Summary

- Most vaginal procedures for pelvic organ prolapse and stress urinary incontinence can be performed successfully under local anesthesia with sedation
- It is well tolerated by patients
- It avoids systemic side effects of anesthetics
- It allows immediate ambulation and oral intake
- It may reduce overall costs

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Special Considerations for Surgery of the Elderly and Patients with Medical Conditions

Erin E. Ducey, MD
Associate Professor
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Perioperative Mortality: Gynecologic Surgery


>2.8% mortality in women >70 years undergoing GYN-ONC surgery¹

>4% mortality rate in women 70-85 years of age undergoing elective GYN surgery²

>Mortality rate for Abdominal Hysterectomy³

- * 60-69 years: 0.5%
- * 70-79 years: 2%
- * > 90 years: 10%

¹ Sasini. Gynecol Oncol 1999 Dec;75(3):437.
² Taglia MR. Am J Obstet Gynecol 2003 Dec;189(6):1584-7.
³ Lafl. Br J Obstet Gynaecol 1991;98:147.

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Postoperative Morbidity in the Elderly

Of 372 elderly patients undergoing elective major abdominal surgery:


***Temporal Order of Recovery:**

- Cognitive Status – 3 wks
- Basic ADL – 6 wks to 3 mos
- Complex ADL – 3 to 6 mos

***Recovery was linked to preoperative physical status, preoperative cognitive and depressive status, and occurrence of postoperative complications¹**

Functional decline from baseline begins by the second day of hospitalization and does not improve by the time of discharge²

1. Lawrence VA. J Am Coll Surg 2002;195:762-77.
2. Hirsch. J Am Ger Soc 1990;38:1296.

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Delirium in the Post-Operative Period

Acute State¹

Prevalence: up to 50% of hospitalized elderly¹


Incidence: *31% of hospitalized patients 65 years or older (medical & surgical)²

*9% of patients over 50 years, undergoing major elective non-cardiac surgery³

Risk Factors: Drug Interactions, Alcohol or Sedative Withdrawal, Dehydration, Endocrinopathies, Depression, Dementia, Anesthetics, Hypoxia, Sepsis

1. Delirium in Elderly Patients. Am J Ger Psych Feb 2004;12:7-21
2. Risk factors for delirium in hospitalized elderly. JAMA 1992 Feb 12;267(6):827-31.
3. A clinical prediction rule for delirium after elective noncardiac surgery. JAMA 1994 Jan 12;271(2):134-9.

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Delirium in the Post-operative Period

Features: patient is easily distracted
reduced level of consciousness
perceptual disturbance (hallucinations, delusions)
disturbed sleep-wake cycle
disorientation to time/person/place


Evaluation: Vital signs, O₂ saturation, physical examination, review of prescribed and withheld medications, CBC, serum electrolytes, urinalysis, EKG, Chest x-ray

Treatment: Find & Treat any underlying cause
Minimize use of restraints
Visual & Verbal Cues, Support

1. Diagnostic and Statistical manual of mental disorders. 3rd rev.ed. Washington, DC: American Psychiatric

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Cardiac Output

$$\text{Cardiac Output} = \text{Stroke Volume} \times \text{Heart Rate}$$

Diminished contractility response to stress

Increased cardiac work

Decreased cardiac reserve


Prevalence of cardiac arrhythmias

Decreased HR response to stress

Decreased cardiac reserve

Cardiac Output is largely dependent on Stroke Volume


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Age-Related Changes in the CV System

- HR is not a reliable marker for stress or fluid status
- CO largely dependent on SV
- Decreased cardiac reserve
- Conditions that decrease preload (atrial fibrillation, hypovolemia)
- Increased preload and afterload (fluid overload,
- Hypertension, aortic stenosis) may lead to congestive heart failure
- Increased risk of orthostatic hypotension (falls)

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Water Conservation

- Increased ratio of medullary nephrons which tend to excrete more free water
- Decreased ability to concentrate urine: decreased release of Angiotensin II & decreased responsiveness to Anti-Diuretic Hormone (ADH)
- Decreased thirst perception & awareness of volume contraction

↓ ↓ ↓

Increased Susceptibility to Dehydration

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Na⁺ & K⁺ Conservation

Decreased responsiveness to Aldosterone

- Decreased sodium resorption
- Decreased potassium excretion


Delayed clearance of an acid load

K⁺ shifts out of cells

↓ ↓ ↓

Increased risk of dehydration, hyponatremia & hyperkalemia

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Age-Related Changes in the Renal System

- Urine output may not be a reliable indicator of fluid status
- Serum creatinine is not a reliable marker of renal function
- Increased risk of acute renal failure due to decreased reserve
- Increased risk of electrolyte abnormalities

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30-Minute Break

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Local Anesthetics and Sedation

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Nurse Anesthetist
Anesthesiology

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Pharmacology of Local Anesthetics

- Na⁺ channel blockade
- Tertiary amine base
- Esters or amides – “-caine”
 - benzocaine, Novocain, cocaine
 - lidocaine, mepivacaine, bupivacaine
- Additives

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Choice

- **Lidocaine** – potent, rapid, moderate duration
- **Mepivacaine** – potent, rapid, moderate duration
 - Expensive
- **Bupivacaine** – very potent, less rapid, long duration
 - Toxicity concerns
- **Procaine/Novocain** – less potent, less rapid, shorter duration
 - Poor penetrating ability
 - Alternative for amide-allergic

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Maximum Dose

- Lidocaine or mepivacaine
 - Without epinephrine
 - 4 mg/kg not to exceed 300 mg (1% solution: 0.4 mL/kg, < 30 mL)
 - With epinephrine
 - 7 mg/kg not to exceed 500 mg (1% solution: 0.7 mL/kg, < 50 mL)
- Bupivacaine
 - Without epinephrine
 - 2 mg/kg not to exceed 175 mg (0.25% solution: 0.8 mL/kg, <70 mL)
 - With epinephrine
 - 3 mg/kg not to exceed 225 mg (0.25% solution: 1.2 mL/kg, <90 mL)

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Calculations

- Ideal body weight (Devine, 1974; Pai & Paloucek, 2000)
 - Males: IBW = 50 kg + 2.3 kg for each inch over 5 feet
 - Females: IBW = 45.5 kg + 2.3 kg for each inch over 5 feet
- Maximum dose volume
 - (IBW kg) X (max dose in mg/kg) / (% conc X 10 mg/mL)
 - 70kg X 4mg/kg / 1%X10mg/mL = 28 mL
 - 64kg X 2mg/kg / 0.25%X10mg/mL = 51 mL
 - 90kg X 7mg/kg / 1%X10mg/mL = 63 mL. (NO! Use IBW; <50mL)

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Toxicity

- Signs/Symptoms
 - Lightheadedness, dizziness, paresthesia
 - Visual or auditory disturbances
 - Tremors
 - Generalized convulsions
 - CNS depression, coma, respiratory depression
 - Cardiovascular collapse
- Bupivacaine
 - Narrow margin between seizures and cardiac arrest
 - Refractory ventricular tachycardia/fibrillation


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Treatment of Toxicity Reaction

- Airway
- Lipid emulsion therapy? Alert perfusionist!
- Benzodiazepines
- ACLS
 - Amiodarone for ventricular arrhythmias
 - Small boluses of epinephrine
- Lipid emulsion therapy!
 - Bolus 1.5 ml/kg of 20%, Infuse 0.25 ml/kg/min, Re-bolus, increase to 0.5 ml/kg/min
 - Max 10 ml/kg over 30 min
- Cardiopulmonary bypass


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Sedation Goals

- Safety
- Anxiolysis
- Amnesia
- Hypnosis
- Immobility
- Analgesia
- Efficiency


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Balanced Sedation Anesthetic

- **Analgesia:** fentanyl, ketamine, local anesthetic, remifentanyl
- **Sedative:** propofol, etomidate, midazolam, ketamine, diphenhydramine
- **Antiemetic:** diphenhydramine, ondansetron


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Levels of Sedation

- **Minimal** – anxiety relief
- **Moderate** – conscious sedation, responds to commands
- **Deep sedation** – arousable only with repeated or painful stimuli
- **General anesthesia** - unarousable


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Agents for Sedation

- **Midazolam** – prolonged sedation
- **Dexmedetomidine** – slow induction (12 min), slow emergence (25 min), bradycardia, hypotension (Slovis, 2011; Tosun, et al., 2006)
- **Etomidate** – myoclonus (20%; Miner & Krause, 2007)
- **Ketamine** – analgesia, emergence phenomena, sympathetic stimulation, PONV, slow emergence
- **Propofol** – cardiovascular/respiratory depression, myoclonus (0.1%)
- **“Ketofol”** – propofol/ketamine combination


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Propofol

- **Dose**
 - 150 mcg/kg/min 3-5 min then 25-75 mcg/kg/min (Hospira, 2004)
 - 200-300 mcg/kg/min 2-3 min then 75-150 mcg/kg/min (general anesthesia per Hospira)
- **Side effects**
 - Pain on injection
 - Dose-dependent cardiovascular and respiratory depression
 - Rare myoclonus (1/1000 to 1/10,000; AstraZeneca)

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My Typical Sedation

- On arrival to OR
 - 50 mg lidocaine, 300 mcg/kg/min propofol, 100 mcg fentanyl, 2 mg midazolam, 4 L/min O2
- On loss of responsiveness to voice
 - Reduce propofol to 100-200 mcg/kg/min depending on reaction to induction
 - Titrate propofol to effect
 - Expect to place oral airway
- Antiemetics
 - Dexamethasone 8 mg
 - Ondansetron 4 mg
 - Ketorolac 30 mg
- For healthy patient: ASA 1-2, BMI <30, 55-90 kg, 20-65 yrs

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Anesthetist's Communication with Surgeon

- Pre-op
 - Surgeon's tolerance for patient movement
 - Invitation to communicate needs during procedure
 - Invitation to convert to general anesthetic as needed
 - Surgeon's expected need for cough/Valsalva
- Intra-op
 - Attend to surgeon's conversations with others
 - Invite discussion in event of patient movement
 - Verify dose local anesthetic and max dose for patient
- Post-op
 - Invite feedback on adequacy of surgical field, movement, patient satisfaction

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Things to Do in the Operating Room and in Preparation for Vaginal Surgery under Local Anesthetics with Sedation

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Patient Selection

Start with

- Procedures you are proficient in
- Uncomplicated cases
- Single procedures
- Patients of normal weight

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Patient Counseling

Review advantages of local with sedation

- Breathing independently
- Less nausea and vomiting
- Immediate ambulation and food intake
- Potentially less post-operative pain
- Potentially quicker immediate post-operative recovery
- Low reported need for conversion to general anesthesia
- High patient satisfaction

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Anesthesia Care Provider

Work with anesthesiologist or nurse anesthetist

- With experience administrating sedation
- Willing to work with you during initial cases
- With whom you can communicate

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Pay Attention to Your Patient

- Position comfortably
- Communicate, let her know what you are about to do
- Assess her comfort regularly
- Manipulate as little as possible

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Surgical Technique

- Be deliberate
- Manipulate the patient as little as necessary
- Use as few instruments as necessary
- Use retractors sparingly
- Communicate with the anesthesia care provider
- Communicate with your patient

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Notes

Record your notes from the workshop here