

Perioperative Care of the Surgical Patient: an evidence based approach

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Disclosures

- Merck Speakers Bureau
- Genzyme Speakers Bureau
- Covidien Speakers Bureau

Learning Objectives

- To compare the common types of hysterectomies.
- To review the evidence on perioperative care.
- To summarize the data surrounding early feeding after abdominal surgery.
- To review some newer pain management strategies.

“Surgical tradition, prejudice, familiarity and personal conviction tend to dictate surgical procedures rather than evidence-based medicine.”

Hodgson et al Annals of Surgery:231;436, 2000

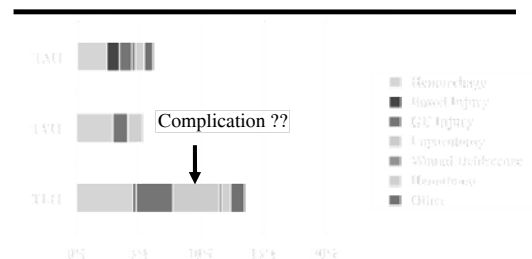
eVALuate Study

2 separate RCTs: TLH v TAH and TLH v TVH

- 937 women UK and S Africa followed 1yr
- Major Complications abd trial:
 - TLH 11.1% vs TAH 6.2% $p=0.02$
 - TLH 84 min vs TAH 50 min
- Major Complications vag trial:
 - TLH 9.8% vs TVH 9.5% $p=0.92$
 - TLH 72 min vs 39 min
 - TLH detected other pathology 16.4% vs 4.8% in TVH $p<0.01$

BMJ 2004;328:129

Complications in the eVALuate Study*



*BMJ 7432:129, 2004

Cochrane: TAH vs TLH vs TVH

*Johnson et al**

- 27 trials: 3643 patients
- TVH vs TAH
 - Shorter hospital stay by 1 day
 - Speedier return to normal activities by 9.5 days
 - Less infections OR 0.42 (0.21 - 0.83)
- TLH vs TAH
 - Less EBL by 45.3 cc (17.9 - 72.7)
 - Shorter Hospital stay by 2 days
 - Speedier return to normal activities by 13.6 days
 - Less infections OR 0.32 (0.12 - 0.85)
 - Longer OR time: 10.6 min (7.4 - 13.8)

Cochrane Database Syst Rev 2006; Apr 19;(2):CD003677

TAH vs TLH vs TVH Cont'

- TLH vs TAH cont'
 - More urinary tract injuries OR 2.61(1.22 - 5.6)
 - No difference TLH vs LAVH vs TVH
 - Lower pain scores
- Conclusions: For benign Dz TVH is preferable to TLH which is preferable to TAH

Indications for Laparoscopic Hysterectomy (TLH)

- Similar to indications for abdominal and/or vaginal hysterectomy
- Very dependent on skill and experience
- Consider intended outcomes and likelihood of success
 - Cancer surgery
 - Prolapse and pelvic floor dysfunction
 - Management of benign lesions
- Be aware of the “learning curve”

LAVH Learning Curve

*Altgassen et al**

- 33 surgeons performing 929 LAVHs
- 8 surgeons (>30 cases) performed 668 LAVHs
- Compared first 30 cases with the rest
- Significant improvements after 30 cases:
 - Intraoperative complications 4.2 vs 0.5% p=0.001
 - Drop in Hb 0.8 vs 0.5 p=0.002
 - Postop complications 12.9 vs 7.0% p=0.02
 - Duration of surgery 149 vs 125 for one of the surgeons

**Obstet Gynecol 2004;104(2):308-13*

TLH Learning Curve

France, single tertiary referral institution

- Retrospective look at 2 periods:
 - 1989-1995 695 pts with TLH
 - 1996-1999 952 pts with TLH
- Major complications 5.6 vs 1.3 $p < 0.005$ for all
- Hemorrhage/transfusion 1.9/2.2 vs 0.1/0.1
- Urinary complications 2.2 vs 0.9
- Conversion rate 4.7 vs 1.4
- Uterine weight 179.5 vs 292.0
- OR time 115 min vs 90 min

J Am Assoc Gynecol Laparosc 2002 Aug;9(3):339-45

Perioperative care

- Preoperative shower
- Hair removal
- Skin prep
- Bowel prep
- Management of Colonic injury
- Prophylactic drains
- Adhesion prevention
- Early Feeding
- Post op pain control

Prevention of Surgical Site Infections:

*Preop showering with antiseptics**

- Meta-analysis of 6 RCTs evaluating antiseptic showers preop (10,007 pts.)
- 3 trials (7691 pts) chlorhexidine v placebo
- RR 0.91 (0.8 – 1.04)
- If only high quality trials: RR 0.95
- No evidence to support any reduction in SSI with preoperative antiseptic showering

**Cochrane Database Syst Rev 2007 Apr 18;(2):CD004985.*

Prevention of surgical site infections:

*Preop hair removal techniques**

- Meta-analysis of 11 RCTs
- 3 trials (625 pts) no difference between razors and depilatory creams v nothing
- No trials clipping v nothing!
- 7 trials (1213 pts) shaving v depilatory cream, more SSIs with shaving RR 1.54 CI (1.05 to 2.24)
- 3 trials (3193 pts) compared shaving v clipping with RR 2.02 (1.2 – 3.4) in favor of clipping
- Conclusions: If hair removal needed, clipping or depilatory cream is preferred over shaving. Consider doing nothing...

**Cochrane Database Syst Rev 2006 (2)*

Prevention of surgical site infections:

*Preop skin prep techniques**

- Meta-analysis of 10 total RCTs (recently updated)
- Trials were too heterogeneous to “pool”
- One trial: chlorhexidine was better than iodine
- No evidence of benefit to iodophor impregnated drapes
- Conclusions: insufficient evidence to support one method over the other
- Baseline infection rate: 15% clean 30% contaminated

**Cochrane Database Syst Rev 2008 (3) updated*

RCT skin prep: chlorhexidine-alcohol vs povidone-iodine*

- RCT 6 centers, 4 years, 849 patients
 - 431 pts 2% chlorhexidine gluconate and 70% isopropyl alcohol
 - 466 pts 10% povidone-iodine
- SSI: 9.5% vs 16.1%, p = 0.004 favoring CHG
- RR SSI: 0.59 (95% CI 0.41 - 0.85)
- 17 pts need to be treated with CHG to prevent 1 SSI
- Caution: FLAMMABLE

**Darouiche RO et al. NEJM 2010;362(1):18-26*

Bowel Prep...

- History dates back many years
- Anesthesia, antibiotics, suture material and infection rates were different
- Practice makes logical sense
- Patient satisfaction: low
- Utility has recently come into question
- Several small RCTs

RCT: Colorectal Surgery +/- Bowel Prep Israel*

- 388 pts undergoing colorectal surgery with primary anastomosis
- Randomized: no prep vs polyethylene glycol
- Results:

	PEG	none
– Wound infection	6.4%	5.7%
– Anastomotic leak	3.7%	2.1%
– Abd abscess	1.1%	1%
– All infections	10.2%	8.8%
- None were significant – no prep is safe!

**Zmora et al Ann Surg 2003 237(3)*

RCT: Colorectal Surgery +/- Bowel Prep Switzerland*

- 153 pts undergoing colorectal surgery with primary anastomosis
- Randomized: no prep vs polyethylene glycol
- Results:

	PEG	none	
- Abd infections	22%	8%	p=0.028
- Anastomotic leak	6%	1%	p=0.2
- Other infections	24%	11%	p=0.03
- Hosp stay	14.9	9.9	p=0.024
- No prep is safe with less complications!

*Bucher et al Br J Surg 2005 92(4)

Meta-analysis Bowel Prep Slim et al* France

- RCTs comparing prep with no prep in colorectal surgery
- 7 trials 1454 patients different preps
- More anastomotic leakage after prep 5.6 vs 3.2% OR 1.75 (1.05 – 2.9) p=0.032
- Other endpoints: favored no prep but did not reach significance
- Leakage greater after PEG vs nothing

*Br J Surg 2004 91(9)

Bowel Prep for Colorectal surgery Cochrane review*

- 9 RCTs (1592) pts – 789 prep, 803 no prep
- Anastomotic leak 6.2% vs 3.2% p=0.003
- Wound infection 7.4% vs 5.4% p=0.07
- Conclusions:
 - No convincing evidence to support the use of prep to decrease infections
 - Prep may be associated with increased rates

*Guenaga et al Cochrane Database Syst Rev 2005 (1)

Bowel Alterations Associated with Prep

*Bucher et al**

- RCT of 50 pts undergoing elective CRS
- Looking for histologic alterations
- PEG vs no prep → colorectal resection
- Blinded pathologist assessed morphology
- Results: bowel alterations more common after prep
 - Loss of mucos 96 v 52% p<0.001
 - Loss of epithelium 88 v 44% p<0.01
 - Severe inflamm 50 v 10% p<0.02

*Dis Colon Rectum 2006 49(1)

Is bowel prep necessary for TLH?

- No solid data on whether prep decompresses the rectum/bowel or not
- May lead to more “fluid” in bowel and distention
- In colorectal surgery associated with increase in infection?
- Conversion rate probably not related to prep but we need data to confirm
- Not very popular with the patients

Mechanical Prep for Gynecologic Laparoscopy*

- Only one trial in gyn evaluating visibility
- 162 pts randomized phosphosoda vs nothing
- Patient discomfort (vis analogue scale) was significantly less in the no prep group
- Adequacy of surgical field (5-point scale) was not compromised - surgeons were blinded
- Bowel preparation does not offer any significant advantage in visibility, operative time or conversion rate

*Muzii et al Fertil Steril 2006, 85; 3: 689-693

Low Residual (Fiber) Bowel Prep

Italy RCT

- 83 pts with benign indications randomized
 - 42 pts <10 g fiber for 7 days
 - 41 pts mechanical prep 1 day prior
- Surgeon was blinded
- Results:
 - Overall discomfort worse in mech prep
 - No other differences including quality of surgical field
 - Low fiber prep comparable to mechanical prep

Arch Gynecol Obstet 2009 Feb 20

Are you still hanging on...

Primary Repair of Colonic Injuries: Cochrane Database*

- 6 RCT (705 pts) primary repair vs colostomy
- Mortality p=NS, OR 1.22 (0.4 - 3.74)
- Total complications OR 0.54 (0.39-0.76) favored primary repair
- The rest approached but didn't reach significance
 - Infectious complications
 - Abdominal infections
 - Wound infections (dehiscence)
 - All were significant if you exclude 1 trial
- Conclusions: primary repair for penetrating colonic injuries colostomy not necessary

**Nelson et al Cochrane Database Syst Rev 2003 (3)*

Prophylactic Anastomotic Drains Cochrane Database*

- 6 RCTs (1140 pts) randomized
- Mortality 3% vs 4%
- Anastomotic leak 2% vs 1% *P = NS*
- Radiologic leak 3% vs 4%
- Wound infection 5% vs 5%
- Re-operation 6% vs 5%
- Other complications 7% vs 6%

**Jesus et al Cochrane Database Syst Rev 2004 (4)*

Prophylactic Drain after LAVH

Taiwan RCT

- 324 pts randomized:
 - 160 pts J-P drain
 - 164 pts no drain
- No significant difference in
 - Febrile morbidity
 - Complications
- Conclusions: May not be necessary

J Am Assoc Gynecol Laparosc 2002;9(3):346-52

Fluid and Pharmacologic Adhesion Prevention Cochrane Database*

- 7 RCTs (6 HA/CMC, 1 ferric hyaluronate)
- No benefit to steroids, heparin, or dextran
- Hyaluronic acid agents (HA/CMC):
 - Decrease incidence adhesions OR 0.15 (0.05 – 0.43)
 - Decrease extent and severity of adhesions
 - No reduction in SBO requiring reoperation OR 0.84 (0.24 - 2.7)
- Ferric hyaluronate was terminated due to side effects

**Kumar et al Cochrane Database Syst Rev 2009 (1)*

Conclusions: Adhesion Prevention Cochrane Database*

- HA/CMC does reduce the incidence, severity and extent of adhesions
- May have implications for reoperation?
- No evidence that bowel obstruction is reduced
- Wrapping the anastomosis may lead to leaks
- HA/CMC may be considered for intra-abdominal adhesion prevention
- 4% icodextrin (spray) too little data (1 trial)

*Kumar et al Cochrane Database Syst Rev 2009 (1)

Prophylactic NGT after Laparotomy Cochrane Database*

- Abdominal operations of any type
- 28 RCTs (4194 pts)
- No NGT: earlier return of bowel fxn $p < 0.00001$
- Trend toward less pulmonary complications $p = 0.07$
- Patient comfort, N/V, L.O.S. favored no NGT
- *Conclusions: routine NGT use after abdominal surgery does not accomplish any of its intended goals and should be abandoned*

*Nelson et al Cochrane Database Syst Rev 2005 (1)

Are you ready to take the leap?

Early Postoperative Feeding after Abdominal Surgery

- Most of the literature comes from General Surgery patients (bowel resection & trauma)
- advantages
 - decreased length of stay
 - safer than total parenteral nutrition
 - less septic complications
 - better wound healing
 - cost-effective
 - positive psychological impact

Early Feeding After Gyn Onc Surgery: 4 trials

- *Canada* 96 pts randomized LOS 4 vs 6 days ($p = 0.0001$) safe no increase complications¹
- *Italy* 122 pts randomized NGT vs early feed: LOS, time to flatus and diet all improved²
- *Indiana* 96 pts randomized early vs delayed feed: more emesis but less LOS $p = 0.008$ ³
- *Stony Brook* 200 pts randomized early feed v flatus. Included bowel resections (34%)⁴

¹Am J Obstet Gynecol 2002 186(5), ²Obstet Gynecol 1999;93:41, ³Gynecol Oncol 1997 67(3), ⁴Obstet Gynecol 1998;92:94

Early vs Traditional Feeding in Gynecologic Oncology Surgery *Stony Brook Trial**

- 200 patients, 5 were non-evaluable
- represents 57% of eligible patients
- included bowel resections 34%
- excluded laparoscopy
- 74% were cancer operations

*Obstet Gynecol 1998;92:94

Results: *Stony Brook Trial*

Outcome	Early	Traditional	P

Early Feeding after Colorectal Resection *Italy**

- 100 pts randomized
 - NGT until flatus
 - Early feeding POD 1
- Complications 24 v 26% p=NS
- Emesis 14 v 32% p<0.05
- 20% needed NGT placed
- No difference in LOS, bowel function
- No NGT is safe after Colorectal surgery

**Feo et al Anz J Surg 2004 74(5)*

Early Feeding after Colorectal Resection *China**

- 316 pts randomized early feed vs NGT
- Flatus 3.0 v 3.6 days p<0.001
- Stool 4.1 v 4.8 days p<0.001
- LOS 8.4 v 9.6 days p<0.05
- Anastomotic leak 1.24 v 2.58% p=NS
- Wound complications 2.48 v 1.94% p=NS
- Fever 3.73 v 9.68% p<0.05
- Pulm infection 0.62 v 4.52% p<0.05
- Pharyngitis 3.11 v 23.23% p<0.001

**Zhou et al World J Gastroenterol 2006 12(15)*

Early Feeding after Colorectal Resection *Elderly Patients**

- 87 patients aged 70 or older had early feeding
- 89.6% tolerated early feeding
- 5.7% required readmission for ileus
- Mean LOS: 3.9 days
- 14.9% complications, none severe
- *Conclusions: early feeding is safe and can be accomplished in an older population after colonic resection*

**Di Fronzo et al J Am Coll Surg 2003 197(5)*

Early Feeding after Colorectal Resection *Cochrane Database**

- 13 RCTs (1173 patients)
- NPO vs early feeding within 24 hours
- No significant difference in any of the variables except mortality (showed a benefit)
- *Conclusions: ...although non-significant results, there is no obvious advantage to keeping patients NPO. They support the notion of early feeding...*

**Cochrane Database Syst Rev 2006 18(4)*

Postoperative Pain Management

- Clearly less discomfort and quicker recovery after laparoscopy
- Does not need continuous PCA so they have less bowel dysfunction after laparoscopy
- They tolerate early feeding very well
- Consider PO pain meds
- Don't forget to infiltrate port sites with local anesthesia

Parkland Trial*

- All outpatient laparoscopic surgeries
- Multiple surgeons and procedures
- Randomized 80 pts celecoxib vs placebo
- 400mg in RR then 200mg BID X 3 days
- Standardized anesthesia and antiemetics
- Evaluate at 1, 2, 3, 7 days and 1 month
- Bupivacaine 0.25% infiltrated prior to closure

*Can J Anaesth 2007 May; 54 (5):342-8

Parkland Trial Results

Pain Score	Placebo	Celecoxib
4 hrs	6 ± 2	4 ± 3 p=0.014
1 day	5 ± 3	3 ± 2 p=0.028
2 days	4 ± 3	2 ± 2 p=0.01
3 days	3 ± 3	2 ± 2 p=NS

± interquartile range

Parkland Trial Results con't

Rescue doses of analgesics	Placebo	Celecoxib
PACU	26	21 p=NS
24 hrs	30	21 p=0.02
48 hrs	29	15 p=0.01
72 hrs	27	12 p=0.01
Fentanyl dose in PACU (µg)	127	84 p=0.03
Pt satisfaction (0 – 100)	80	94 p=0.01

Parkland Trial Conclusion

Outcome variables (days)	Placebo	Celecoxib
Normal diet	3	2 p=NS
Normal bowel function	3	2 p=0.042
Normal activity	6	4 p=0.014

- Decrease pain scores
- Decrease in rescue analgesia
- Improvement in patient satisfaction scores

Systematic Review: Local Anesthesia after Laparoscopy

- 41 trials, 2794 pts, local anesthesia vs nothing
- IntraPeritoneal and/or port site infiltration
- Cholecystectomy: IP infiltration improved visual analog pain score 13mm (95% CI 6-20)
- 3/8 port site infiltration showed a difference of questionable clinical significance
- All trials using mesosalpinx blocks showed a difference vis anal score 19mm (95% CI 14-25)
- Bottom line: IP blocks work, port site infiltration not as convincing

Moiniche et al. Anesth Analg 2000, 90:899-912

IntraPeritoneal Local Anesthesia after Gynecologic Laparoscopy

- RCT 180 pts, operative Gyn laparoscopy:
 - Bupivacaine 0.5%, Ropivacaine 0.75%, Saline
 - 20cc infused over operative site and under diaphragms
- Morphine use at:

wake up	24 hrs	N/V
Bupiv	0.92 mg	3.08 mg 10%
Ropiv	0.25 mg	0.69 mg 15%
Saline	4.18 mg	12.93 mg 43%

Metaanalysis Local Anesthesia: Better Late than Never?

- Preemptive vs postoperative infiltration of port site.
- 26 trials, 2546 pts
- Results:
 - Pre and post administration were both better than placebo
 - No difference between pre and post op infiltration
 - For IP use Pre was significantly better than both post and placebo
- Conclusions:
 - For skin infiltration it doesn't matter when, just do it!
 - Preop Intraperitoneal use really makes a difference.

Coughlin et al. Surg Endosc, 2010 DOI 10.1007/s00464-010-1111-1

Vaginal Cuff Dehiscence (VCD)

- Observational case series Magee-Womens
- 7039 total hysterectomies - 10 VCD
 - 8 TLH (4.93%)
 - 1 TVH (0.29%) Cum incidence: 0.14%
 - 1 TAH (0.12%) (0%, 0%, 0%, 0%, 0.09%, 0.7%, 0.31%)
- Median time to dehiscence 11 weeks
- Why: ???
 - Learning curve
 - Inappropriate use of thermal energy

J Minim Invasive Gynecol 2007;14(3):311-7

Conclusions:

- Any prep:??? CHG-alcohol may be better
- Clip or depilatory cream, do not shave hair
- No need for bowel prep, might increase complications
- Primary repair of colonic injuries
- No need for routine use of Drains
- Hyaluronic acid agents to prevent adhesion
- Consider perioperative celecoxib to decrease post op pain

Conclusions Con't

- Don't forget to use local anesthesia to infiltrate port sites (0.25% bupivacaine)
- Doesn't matter whether you infiltrate before or after surgery!
- Intraperitoneal use is best preemptively
- Remember the learning curve
- Watch for vaginal cuff dehiscence after TLHs

Thank You...