



**MIS Meets CAOS**  
**Scottsdale, AZ**  
**October 27, 2006**

**Lessons Learned after >2,000 Consecutive, Posterior, Single-Incision LIS THA's**  
**Todd V. Swanson, MD**  
**Las Vegas, Nevada, USA**

### The Acronym Alphabet Soup

- MIS—No THA minimally invasive
- Mini-incision
  - Implies small incision only
  - Nothing magical about 10cm
    - Base<sub>10</sub> society
    - 10 fingers & toes
- LIS—“less Invasive”

5/5/06 Posterior Approach L/MIS THA 2 DDC

### History

I began working on small incision posterior approach in May 1997

The Journal of Arthroplasty Vol. 20 No. 7 Suppl. 3 2005

Early Results of 1000 Consecutive, Posterior, Single-Incision Minimally Invasive Surgery Total Hip Arthroplasties

Todd V. Swanson, MD

Since then, 1,005 additional LIS THA's with 6 mo f/u

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### Now >2,000 LIS THA's

- Second 1,005
  - 1,235 THA's from 5/02 – 4/06
  - 230 excluded
  - Minimum 6 months follow-up
  - 1,005 remaining for study

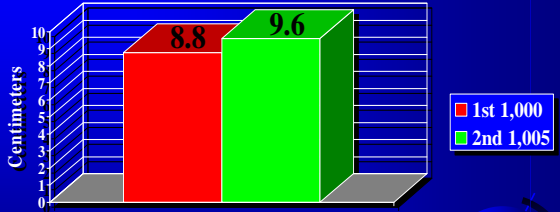
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### Lessons Learned after >2,000 MIS THA's

- Excessively small incisions detrimental
- Deep dissection: “Less is More”
- Balance the hip
- Repair the capsule
- Autologous blood rarely necessary
- Local anesthetics work wonders
- Rehab for motion

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### Incision Length (cm)



Centimeters

8.8 (6-16 cm) 9.6 (7-16 cm)

(Incision length  $\approx$  BMI / 3)

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## 1997 Incision



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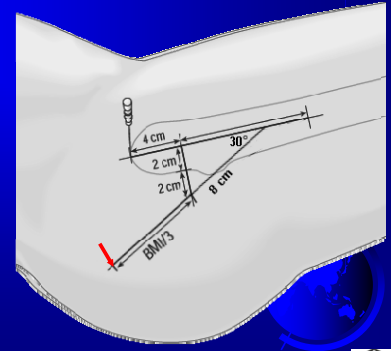
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## Incisions

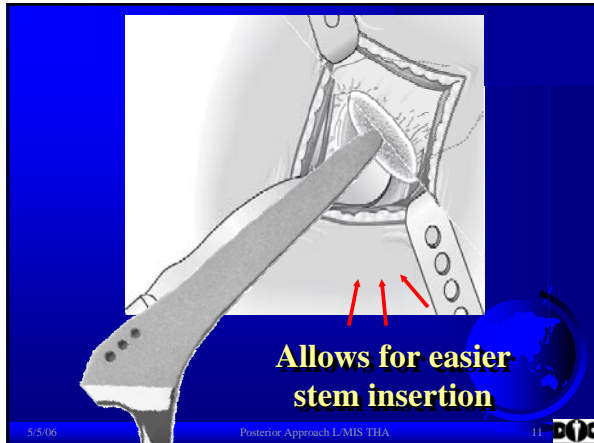
- More posterior than previous to assist with femoral component insertion



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Allows for easier stem insertion

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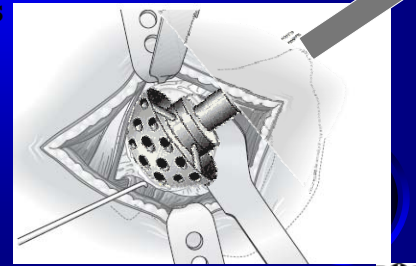
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## Incisions

- Small accessory incision for acetabular placement in heavy patients



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## Deep Tissue Dissection “Less is More”

- Often unnecessary to release
  - Superior & anterior capsule
  - Piriformis and quadratus
  - Gluteus maximus tendon
- Remove acetabular osteophytes only when impinging



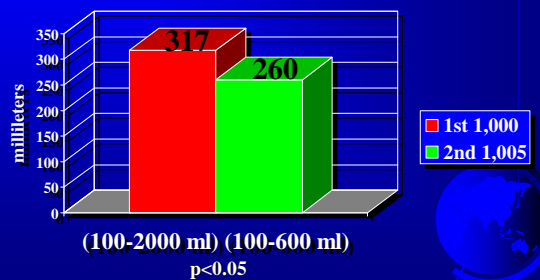
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## Intra-Op Blood Loss (ml)

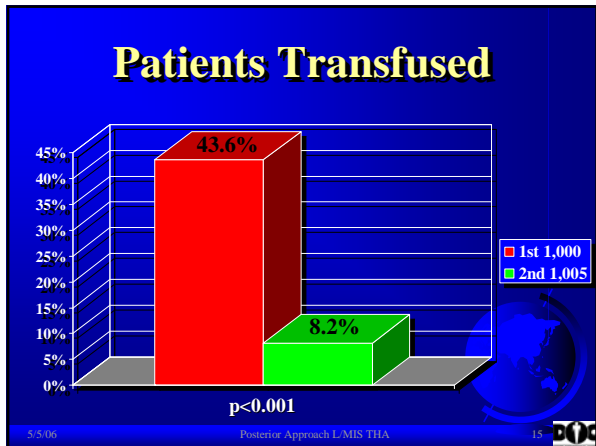


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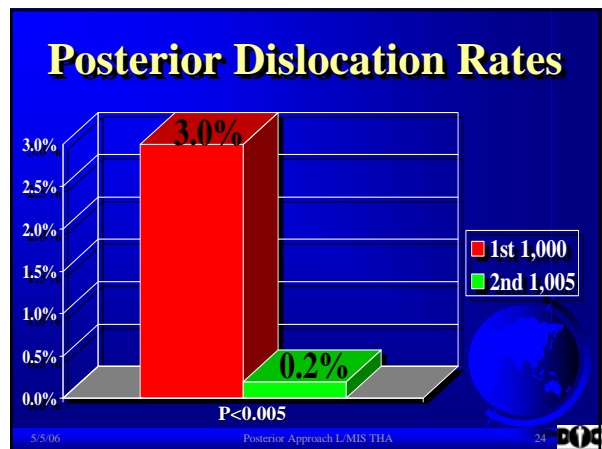
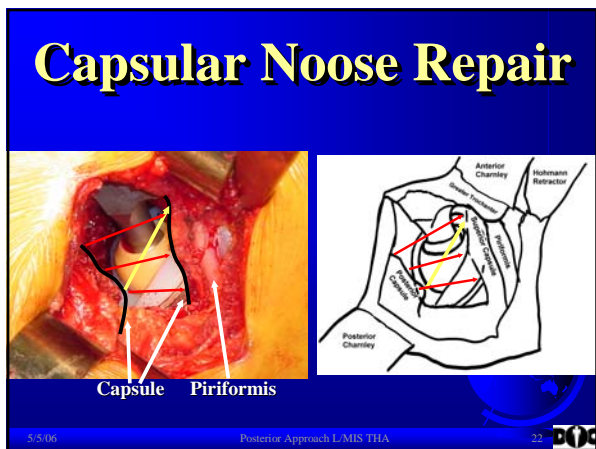
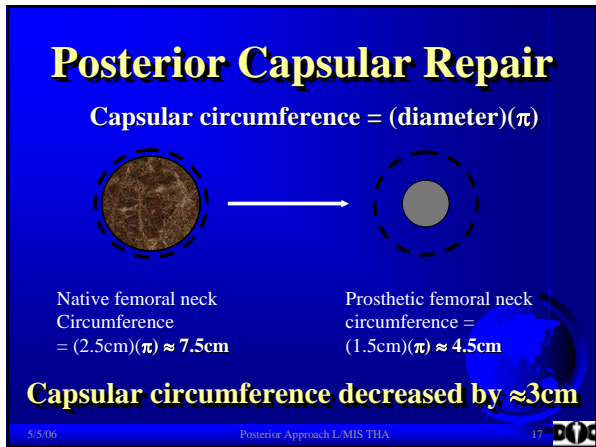
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- ### Balance Soft Tissue Structures
- Offset stems
  - Selective releases
    - Tendons
    - Capsule
  - Posterior capsular repair/advancement
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## Change in Post-Op Protocol Rehab for Motion (like TKA)

- No abduction pillow
- No dislocation precautions
- Ambulate immediately
- Begin ROM exercises first day post-op
  - Hip flexion / external rotation
  - “Figure-4”



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## Pain & Nausea

- Pre-emptive pain management
  - Pre- and post-op analgesics
  - Local injections
- Pre-emptive anti-emetics
  - Pre-op
  - Post-op



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## Pain Management

- Pre-emptive Celebrex or Mobic day of surgery
- Toradol
- Ultram
- Oxycodone or hydrocodone
- Patient controlled analgesia (PCA) as backup only (patients rarely use)

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## Local Injections

- Blocks--psoas
- Capsule
  - Bupivacaine or ropivacaine
  - Ketorolac
  - Morphine
  - ±Steroid
  - (Clonidine)
- Skin/sub-Q



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## Nausea Management

- Pre-emptive anti-emetics
  - Metoclopramide (Reglan)
  - Ondansetron HCl (Zofran)
- Post-operative prochlorperazine (Compazine) x 24 hours
- Minimize narcotics
- Generous hydration



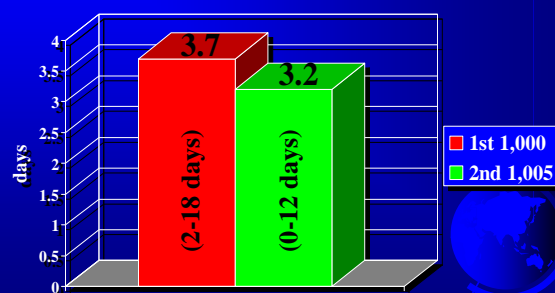
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## Hospital Stay (days)



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## Comparative Studies: Mini-inision vs Standard

- Most studies poorly designed
- Many suggest no difference/no advantage
- Some show disadvantages/risks

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## Comparative Studies (Positive)

Author	Design	N	Conclusion	Comment
DiGioia, J Arth, 2003	Prospective with matched controls	33 MI vs 33 standard	Improved limp, distance walked, stairs @ 3 & 6 mo	Incision length 11.7cm vs 20.2cm
Swanson, AAOS, 2003	Prospective with historical controls	100 MI vs 50 standard	Less blood loss, OR time, pain, hospital stay, compls; quicker functional return	Incision length 10-14cm vs 20-25 cm
Sculco, J Arth, 2004; ICL, 2004; J Arth, 2004; OCNA, 2004	Prospective, with matched controls	42 MI vs 42 standard	Reduced LOS, better cosmesis, sl higher HHS's	Incisions 8.8cm vs 23.0 cm

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## Comparative Studies (Positive)

Author	Design	N	Conclusion	Comment
Waldman, Orthopedics, 2003	Prospective, surgeon choice	31 MI vs 91 standard	Shorter hospital stay, fewer complications	Incision length 10cm vs 18cm
Goldstein, J Arth, 2003	Retrospective	85 MI vs 85 standard	Less intra-op blood loss; better cosmesis	Many obese; 13cm vs 36 cm

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## Comparative Studies (Neutral)

Author	Design	N	Conclusion	Comment
Ogonda, JBJS-A, 2005 (Ireland)	Prospective, randomized	109 MI vs 110 standard	Safe, reproducible; no difference	Incision length 9.2cm vs 16cm
Asayama, J Arth, 2004 (Athens, GA)	Prospective, randomized	50 MI vs 50 standard (direct lateral)	Less intra-op blood loss; o/w no difference	Incision length <10cm vs 14-18cm
de Beer, J Arth, 2004 (Ontario)	Prospective, matched-pairs	30 MI vs 30 standard (direct lateral)	No difference	Incision length 7.7cm vs 13.9cm
Ciminiello, J Arth, 2004 (Philadelphia)	Prospective, surgeon choice, matched pair	60 MI vs 60 standard (direct lateral)	No difference	Incision length <5 inches vs >5 inches

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## Comparative Studies (Negative)

Author	Design	N	Conclusion	Comment
Teet, J Arth, 2006 (Irvine)	Retrospective review	73 MI vs 54 Standard	More varus cemented stems	Incision length <12cm vs >12cm
Woolson, JBJS-A, 2004 (Stanford)	Retrospective, surgeon choice	50 MI vs 85 standard	More wound compls, acetab malposition, cementless fem comp malsizing	Initial experience by 3 surgeons = <17 cases/ surgeon

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## Summary

- LIS THA is as safe as standard THA
  - When appropriate techniques used
  - When surgeon appropriately trained
- Good comparative studies sorely lacking
- Most important advantage may be the "by-products"
  - Soft tissue handling
  - Dislocation reduction
  - Analgesia
  - Rehab protocols

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