

Advantages of Cementless THA Using Minimally Invasive Surgical Technique

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INTRODUCTION

Minimally invasive techniques have been developed in many areas of surgery including orthopaedic surgery. General surgeons have developed laparoscopic techniques for performing a plethora of procedures that previously required large abdominal incisions. Urology, gynecology, and plastic surgery have all developed techniques involving smaller incisions and less dissection. Benefits include cosmesis, less pain, lower morbidity, and quicker recovery.

Recently, minimally invasive techniques have been increasingly applied to orthopaedic procedures. These include arthroscopic surgery of multiple joints, minimally invasive discectomy and lumbar fusions, and minimally invasive fracture fixation. Comparable advantages have been found with these procedures.

The purpose of this study is to determine whether similar advantages apply to a minimally invasive surgical technique for total hip arthroplasty.

MATERIALS & METHODS

Since 1997, over 1,000 minimally invasive surgery (MIS) posterior approach THA's have been performed and followed prospectively by the senior author. The first 123 consecutive cases in patients ≥ 60 years of age form the study population. All received cementless, double-wedge, tapered stems (SL-Zweymüller, Plus Orthopedics) and cementless cups (Plusfit, Plus Orthopedics or Reflection, Smith & Nephew Orthopaedics).

Study cases are compared to 52 consecutive, historical controls performed between 1994 and 1997 in patients ≥ 60 years of age receiving hybrid THA's (Spectron stems, Reflection cups, Smith & Nephew Orthopaedics) through a standard posterior approach.

Both groups were treated similarly with regard to the following factors:

1. **Anesthesia:** *General*
2. **Pain Management:** *PCA x36 hours followed by oral narcotics*
3. **DVT Prophylaxis:** *TED's, pneumatic stockings, aspirin, and early mobilization*
4. **Weight-bearing:** *Immediate, full*
5. **Discharge:** *When independent and safe*

Both groups were followed at regular intervals with questionnaires, clinical exams, and radiographs. Results were compared using either the Student's t-Test or the Chi-square test for statistical significance.

All cases included in the study have minimum 24-month follow-up (24-96 months). Twenty-three cases in the study group and two cases in the control group were excluded due either to death or loss to follow-up prior to the minimum follow-up period, leaving 100 MIS and 50 standard incision patients as the basis for this study.

RESULTS

There were no differences in mean age, weight, diagnoses, Dorr Bone Types, or Charnley Functional Classes between the two groups. Mean pre-op and final follow-up Harris Hip Scores were similar between the two groups (MIS: 26→87; Standard: 28→83). Advantages of MIS over the standard incision approach included:

	MIS	Standard	p-value
Anesthesia Time	50 minutes	83 minutes	<0.0001
Intra-Op Blood Loss	285 milliliters	487 milliliters	<0.0001
Post-Op Problem Pain (Deviation from Protocol)	0%	12%	<0.0001
Hospital Stay	4.0 days	5.4 days	<0.0001
Return to Full Activities	6.2 weeks	12.9 weeks	<0.001
Overall Complication Rate	13%	24%	0.09

Specific complication rates included the following:

	MIS	Standard	p-value
Deep Infection	1%	0	NS
Superficial Infection	1%	0	NS
Wound Healing Problems	0	0	--
VTE (DVT/PE)	1%	2%	NS
Dislocation	3%	2%	NS
Nerve Palsy	1%	0	NS
Post-Operative Confusion	4%	12%	0.06
Acetabular Loosening	0	0	--
Femoral Loosening	0	0	--
Other	2%	8%	--

Component positioning was accurate and reproducible using the MIS technique:

	MIS	Standard	p-value
Acetabular Abduction	40.0° (30-54)	43.4° (27-55)	0.002
Acetabular Anteversion	13.2° (2-31)	13.3° (1-31)	NS
Femoral Stem Varus >5°	0	0	--

CONCLUSIONS

Minimally Invasive THA using cementless fixation has several advantages over standard posterior incision THA using hybrid fixation. Whether these advantages are due to the MIS approach, cementless fixation, or a combination of the two remains to be determined.

Development of new instrumentation and better surgical technique provides excellent visualization, minimal skin retraction problems, and accurate component placement. To date, we have performed this procedure in over 1000 patients and have found the technique to be accurate, reproducible, and advantageous to both patient and surgeon.