Direct Anterior THR
Is It Better from the Front?

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Disclosures
• Stryker
  – Educational consultant
• OrthoSensor
  – Stockholder

Direct Anterior History
Not new or experimental!

First described by Carl Hueter in Germany in ~ 1881
**Direct Anterior THR History**

Popularized by Smith Petersen

The DA has been used to treat multiple hip disorders.

Use of the DA in hip arthroplasty began with Smith Petersen


**Direct Anterior THR History**

DA was used in France by the Judet Brothers

Dr. Robert Judet and Dr. Jean Judet.


**Direct Anterior THR History**

DA used extensively by Kristaps Keggi in the US.

Kristaps Keggi

Direct Anterior THR History

There have been two main approaches to using the DA in THR, one with the use of a specialized orthopedic table, popularized by Joel Matta.

Joel Matta


Michael Nogler


The principles and basic technique of the approach are the same with or without the use of a specialized orthopedic table.

The History of the anterior approach to the hip.
Rachbauer F, Kain MS, Leung M.
The History

The DA for hip surgery has been in use for over 130 years. Use of the DA in hip arthroplasty began with Smith Petersen. The last decade has seen a significant increase in the use of the DA for THR.

Direct Anterior Approach Scientific Basis

A basic principle in orthopedic surgery has been to use intermuscular and internervous planes to minimize soft tissue damage.

Direct Anterior Approach Scientific Basis Concept

The definition of minimally invasive THR is to use internervous and intermuscular planes to do the surgery. Length of skin incision is NOT a reasonable definition of minimally invasive. DA is the only approach to the hip that meets this criteria.
Direct Anterior Approach Scientific Basis

Multiple Authors Have Proposed
DA THR Has:

Less Soft Tissue Damage
Faster & Easier Recovery
Lower Dislocation Risk

Is there data?

Anterior Approach in THA Improves Outcomes
Affirms.

JOSEPH T. MOSKAL, Orthopedics,
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DA Has Less Soft Tissue Damage

More Abductor Damage With Posterior Approach Than With Direct Anterior Approach

Less damage in the abductor tendons with the Smith-Petersen approach.
The posterior approach had measurable damage to the abductor muscles in each specimen


DA Has Less Soft Tissue Damage

The DA THR approach caused significantly less muscle damage than did the posterior surgical approach

CK level in the posterior-approach group was 5.5 times higher than that in the anterior-approach group.

COMPARISON OF MINIMALLY INVASIVE DIRECT ANTERIOR VERSUS POSTERIOR TOTAL HIP ARTHROPLASTY. Patrick F. Bergin, MD, Jason D. Doppelt, MD, Curtis J. Kephart, MD, Michael T. Benke, MD, James R. Greiter, MD, Andrew S. Holmes, MD, Hana Haleem-Smith, BS, Rocky S. Tsuan, PhD, and Anthony S. Unger, MD. J Bone Joint Surg Am. 2011;93:1392–8
DA Recovery is Faster & Easier

A Comparison of Direct Anterior and Lateral THA: Postoperative Outcomes

Conclusion: Patients undergoing DA THA showed improved function and pain scores 6-weeks and 6-months postoperatively when compared to AL THA. There is also functional superiority which continues at to 1-year postoperatively.

DA Recovery is Faster & Easier

A prospective, randomized study compared lateral approach THA and DA THA. DA THA had significantly better improvements at 6 weeks, 6 months, and 1 year than did the direct lateral approach THA.


DA Recovery is Faster & Easier

DA offered accelerated early post-op recovery compared to the PA, the differences disappeared by six weeks. Variances for cup anteversion and inclination were smaller for the DA group as compared to PA group.

DA Recovery May Be Faster & Easier

A prospective, randomized IRB-approved clinical study comparing 43 DA THA to 45 MP THA.

CONCLUSION

The DA THA cohort required less post-op pain medication, half-day shorter LOS and patients had higher functional scores at one and three months. There was less variability in the acetabular cup anteversion. There were no functional differences at one year between the anterior and posterior cohort.


DA Recovery May Be Faster & Easier

This study evaluated early postoperative results of 150 consecutive primary total hip arthroplasties performed by a single surgeon; 50 MP approach, 50 during the learning curve for DA, and 50 subsequent cases when the approach was routine.


DA Recovery May Be Faster & Easier

The DA groups had decreased LOS (2.9 and 2.7 days versus 3.9 days for the posterior group; P<0.0001) Home vs SNF was more likely (80% and 84% in DA, 56% in posterior group; P=0.0028). With DA, there was significantly less use of assistive devices and narcotics at 6 weeks, with less pain. Primary total hip arthroplasty using the anterior approach allows for superior recovery in a matched cohort of patients.

DA Has A Lower Dislocation Rate

1% Dislocation Rate For DAA THR Using A Fracture Table

<table>
<thead>
<tr>
<th>Authors</th>
<th>Number of THA</th>
<th>Dislocations</th>
<th>Dislocation rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sigaur et al</td>
<td>1037</td>
<td>10 (2 revisions)</td>
<td>0.96%</td>
</tr>
<tr>
<td>Matta et al</td>
<td>494</td>
<td>3 (no revisions)</td>
<td>0.61%</td>
</tr>
<tr>
<td>Sarid et al</td>
<td>1764</td>
<td>27 (2 revisions)</td>
<td>1.5%</td>
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<td>Jevoni et al</td>
<td>800</td>
<td>7 (1 revision)</td>
<td>0.88%</td>
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<tr>
<td>Nuckles et al</td>
<td>247</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Mork et al</td>
<td>294</td>
<td>1 (no revision)</td>
<td>0.34%</td>
</tr>
<tr>
<td>Green (author's series)</td>
<td>61</td>
<td>6</td>
<td>1.0%</td>
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<tr>
<td>Total</td>
<td>4497</td>
<td>48</td>
<td>1.0%</td>
</tr>
</tbody>
</table>


DA Has A Lower Dislocation Rate

A retrospective radiograph review of a consecutive series of 609 THAs was performed. Surgeries were performed by nine fellowship trained adult reconstruction specialists. Acetabular component alignment in primary THA improved with the use of a supine DA approach with or without intraoperative fluoroscopy when compared to a posterior approach in the lateral position with or without the use of intraoperative radiography.


There Is Data To Support DA THR Has:

Less Soft Tissue Damage
Faster & Easier Recovery
Lower Dislocation Risk

However......
DA Learning Curve
This is the first study to define the learning curve of the single incision anterior supine total hip arthroplasty. Improvements were noted after 40 cases and improved substantially after 60 cases. We have noted an obvious improvement in proficiency with a lack of major complications. Surgeons that consider this approach should expect a substantial learning period.

Learning Curve for the Anterior Approach Total Hip Arthroplasty
Poster Presentation Number: P017, AAOS 2009, Marc Wilson Hungerford, Tarun Bhargava, Lynn C Joven, Robin Nestor Gaytha

DA Learning Curve
The early clinical and radiographic results of minimally invasive anterior approach total hip arthroplasty performed by community practice orthopaedic surgeons who had limited training in the technique were inferior to the reported results of an innovator of this technique. Adequate training is critical to reduce the risk of complications during the learning curve of minimally invasive procedures.

Minimally invasive Anterior Approach THA in a Community Practice Setting
Poster Presentation Number: P039, AAOS 2009, James I Huddleston, III, Michael Pouliot, Steven T Woolson

DA Learning Curve
643 stems were inserted either through the PA or DA approach.
CONCLUSION: A trend was observed towards performing more stem revisions when changing approach AND stem design at the same time. It is unknown whether stem design, femoral visualization or postoperative mobilization are responsible for this trend.

DA Learning Curve

Conclusions: The technique is perhaps more technically demanding than the lateral approaches used today due to the somewhat limited surgical exposure. Morbidly obese or very muscular patients as well as patients with a short femoral neck or acetabular protrusion can represent particular problems. Our results indicate that there are certain risks when adopting this procedure but the complications noted are avoidable.

Summary

There Is Data To Support DAA THR Has:

- Less Soft Tissue Damage
- Faster & Easier Recovery
- Lower Dislocation Risk

However:

There Is A Learning Curve

Thank You