

# Complication rate, transfusion rate, and length of stay following hip replacement using the supercapsular percutaneously-assisted total hip surgical technique

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## Background and Objectives

### Background

Several minimally invasive and tissue-sparing total hip arthroplasty (THA) surgical techniques have been developed to reduce collateral soft tissue damage, length of stay (LOS), and hospital costs. As incisions become smaller to obtain these benefits, there is potential for complications due to reduced visibility and increased technical difficulty.

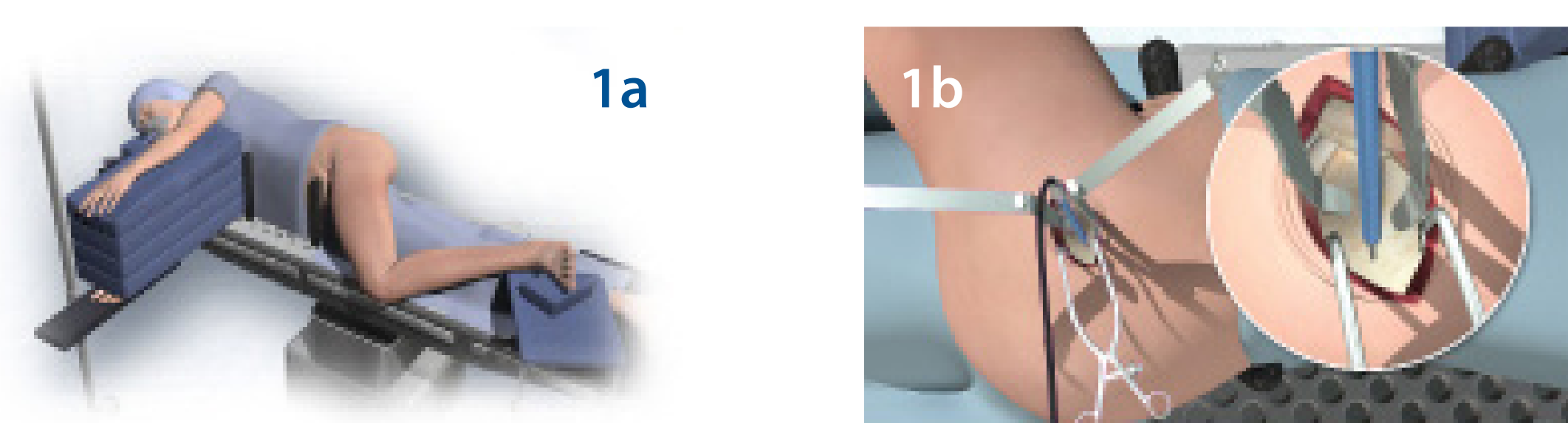
### Objectives

**Primary:** to determine the incidence and types of complications for the supercapsular percutaneously-assisted total hip (SuperPath®) surgical technique.  
**Secondary:** to determine the average LOS, 30-day readmission rate, discharge status, and transfusion rate for this technique.

## SuperPath® Surgical Technique Overview

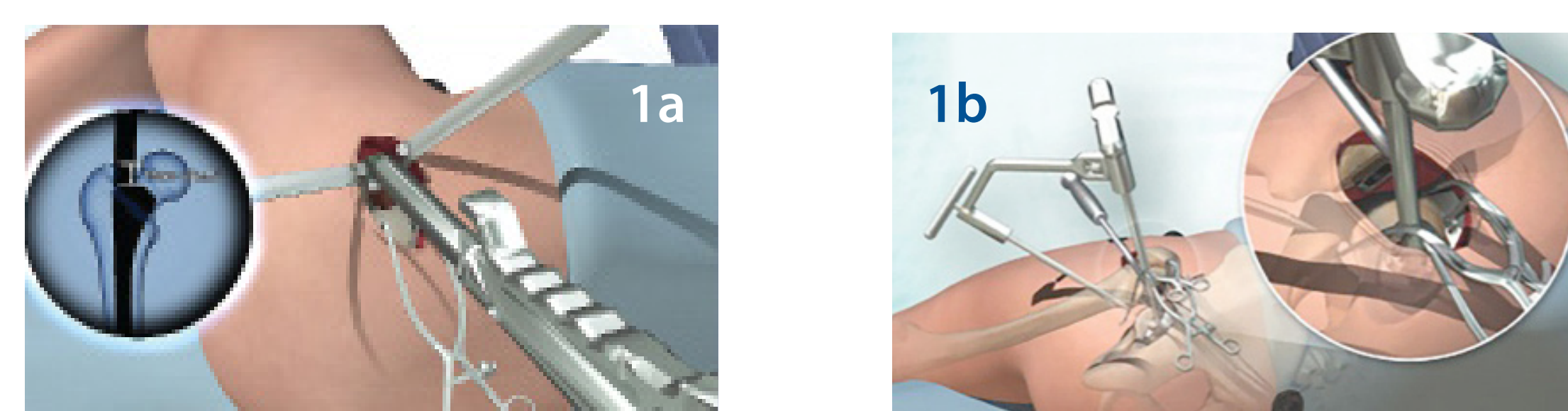
Patients are positioned in the lateral position with the hip in 45° of flexion and 10-15° of internal rotation (Fig. 1a). A 6-8 cm incision is made at the greater trochanter in line with the femoral axis to the level of the gluteal fascia (Fig. 1b). The interval between the gluteus medius and minimus is identified. One blunt holeman retractor is placed between the capsule and the minimus and a second is placed between the piriformis and the capsule. The sciatic nerve is protected by the intact short external rotators. The capsule is incised in line with the main incision from the base of the greater trochanter to approximately 1 cm proximal to the acetabular rim.

Figures 1a and 1b



The femur is reamed and sequentially broached with the femoral head intact to minimize the potential for femoral neck fracture and ensure restoration of the normal anatomic version (Fig. 2a). With the final broach in place as a trial stem and cutting guide, the femoral head is removed. A portal placement guide is placed to allow for in line acetabular reaming (Fig. 2b). Following the use of basket reamers, trial components are placed and the hip is reduced. Definitive components are selected and reduced into place using the same methods after trial components are removed. The capsule is then closed with suture, as are the gluteal fascia and skin.

Figures 2a and 2b



## Methods

- The healthcare databases at three institutions were searched for all primary THAs performed by three surgeons using the SuperPath® surgical technique between January 2013 and July 2014.
- All primary THAs, regardless of indication or patient demographic, were included.
- Collected data elements included: complications, 30-day all-cause readmission rate, discharge status, transfusion rate, and LOS.

### Key Definitions

- 30-day readmission rate: percentage of patients experiencing a hospital admission within 30 days of their THA procedure for any reason.
- Discharge status: disposition of the patient at discharge from hospital following the THA procedure.
- Length of stay (LOS): number of nights the patient remained in the hospital (e.g. a patient admitted and discharged on the same day had a LOS of zero days).

## Results

Table 1 shows the outcomes from the three hospitals/surgeons presented separately and combined.

**Table 1:** Outcomes from the three institutions presented separately and combined

	Site 1	Site 2	Site 3	Composite
Number of THAs	261	65	479	479
30-Day Readmission Rate (%)	3.2%	2.0%	1.5%	2.3%
<b>Discharge Status</b>				
Home (%)	95.0%	89.3%	92.3%	91.5%
Skilled Nursing Facility (%)	5.0%	3.0%	6.1%	4.1%
Home Health Care (%)	-	7.0%	-	3.8%
Inpatient Rehab Facility (%)	-	0.7%	1.5%	0.6%
Transfusion Rate (%)	8.0%	0.7%	3.0%	3.3%
Mean Length of Stay (days)	2.0	1.4	2.1	1.6
<b>Complications</b>				
Dislocation (%)	1 (0.06%)	2 (0.7%)	1 (1.5%)	4 (0.8%)
Deep Vein Thrombosis (%)	-	1 (0.3%)	-	1 (0.2%)
Fracture (%)	-	3 (1.4%)	1 (1.5%)	4 (0.8%)
Infection (%)	-	-	-	0 (0.0%)
Pulmonary Embolism (%)	-	-	-	0 (0.0%)

## Discussion

### Complications

- Complications were rare (1.8%), with only a single thromboembolic event (0.2%) and no infections.
- The dislocation rate was also sufficiently low (0.8%), and compared favorably with rates reported in recent THA studies (2.9-6.0%)<sup>1-3</sup>.
- Complications remained rare at Site 3, where the surgeon was performing his initial cases (learning curve) with the technique.

### 30-Day All-Cause Readmission Rates

- The 30-day readmission rate was 2.3%, nearly half that previously reported in the United States (4.2%)<sup>4</sup>.
- This reduction was likely due to decreased soft tissue damage, incidence of complications, and transfusion rates.

### Length of Stay

- The mean LOS (1.6 days) was less than half the national average in the United States (3.3 days) and national median in Canada (5.0 days)<sup>6</sup>.

## Discussion

### Discharge Status

- Over 95% of SuperPath® patients were discharged directly home (91.5% routinely and 3.8% home health care), which compares favorably to values previously reported in the United States (27.3% routinely and 39.8% home health care).<sup>5</sup>
- Less than 5% of SuperPath® patients were discharged to a skilled nursing facility or inpatient rehabilitation, while nearly a third (31.8%) of patients in the United States require these facilities.<sup>5</sup>

### Transfusion Rate

- The overall transfusion rate was low (3.3%), but rates were somewhat variable between sites (0.7-8.0%). This was expected, as each site had its own anticoagulation and transfusion protocols.
- This rate is significantly lower than those previously reported in the United States (22.2-25.5%).<sup>7-8</sup>

## Conclusions

- The SuperPath® technique was associated with low complication, 30-day readmission, and transfusion rates, even during a surgeon's learning curve.
- Over 95% of patients were discharged home and patient LOS was less than half the national rates reported in the United States and Canada.
- The SuperPath® technique is a viable alternative to other approaches and the improvement in the listed variables may have a profound effect on the economic burden of THA.

## Acknowledgments and Affiliations

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