

## Naviswiss-Navigated THR via SuperPath Approach

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### Introduction

The success of a total hip replacement is greatly affected by correct cup alignment and by achieving an adequate leg length and offset as planned. Navigation can help in reaching this goal which is sometimes difficult with minimally invasive procedures. The team at Metropolitan General Hospital in Athens demonstrated how to use the Naviswiss system to navigate cup, leg length and offset during a total hip replacement using the SuperPath two-incision approach in the lateral decubitus patient position.

### Naviswiss Navigation

The Naviswiss navigation system consists of a handheld navigation device and miniature precision tracking tags. The P-tag is fixed to the pelvis with two 3mm pins via small stab incisions. It serves as fixpoint for cup navigation (Fig 1). The M-tag is seated on the cup impactor via a magnet (Fig 1). The removable F-tag is attached to the femur via a single pin. It is used for leg length and offset navigation (Fig 2).



Fig 1: M-tag attached to the cup impactor for cup navigation (inclination, anteversion)

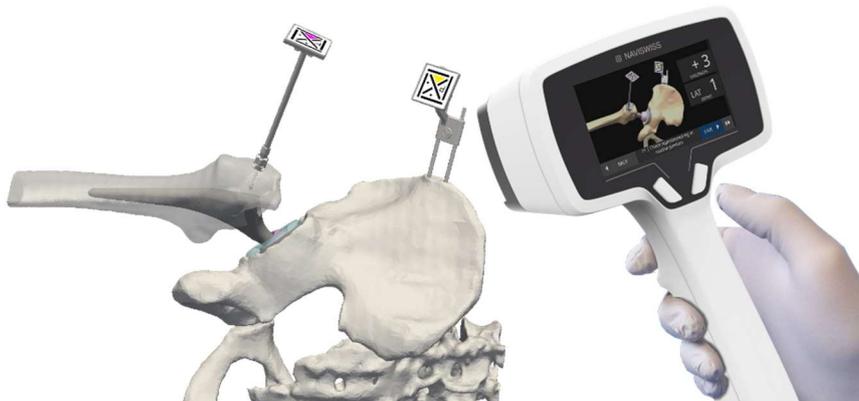


Fig 2: F-tag and P-tag are attached to pelvis and femur for leg length and offset measurement

**SuperPath Approach**

The SuperPath approach starts with the primary incision through which the stem is inserted. The femoral head is resected only after inserting the femoral broach. The acetabular component is subsequently reamed and impacted via a smaller secondary incision situated more distal (Fig 3).



Fig 3 The use of primary and secondary incision during cup insertion with the SuperPath approach (MicroPort)

**Case Description**

A total hip replacement using the SuperPath approach was performed on a 64-year-old female patient (75 kg, 170 cm) with hip arthritis on the left side. The patient suffered pain for 1 year and had a decreased range of hip motion for the last 6 months.

After preparing the femoral canal through the primary incision the broach was left in place. The single-pin navigation interface was then attached to the proximal femur (Fig 4) carefully avoiding a collision with the broach. The baseline for leg length and offset was subsequently measured with the navigation system after temporarily attaching the F-tag to the single-pin interface.

Cup alignment was navigated (Fig 6) with the Naviswiss system by attaching the M-tag to the original cup inserter provided by the implant manufacturer. Finally, the joint was reduced and the F-tag attached to the femur again to measure and document post-operative leg length and offset (Fig 5, Fig 7).



Fig 4: The stem is prepared with the femoral head still in place. Then the single-pin navigation interface for the F-tag is mounted to measure pre-operative leg length and offset.

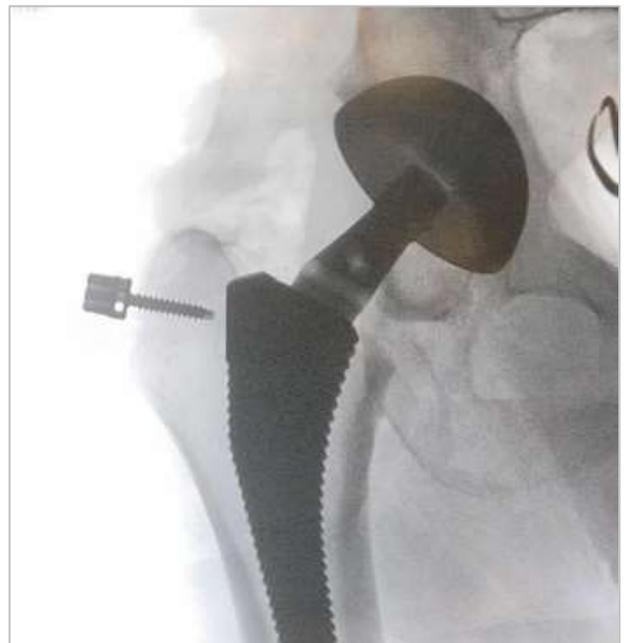


Fig 5: After navigated cup insertion the single-pin interface on the femur is used again to attach the F-tag for measuring leg length and offset.

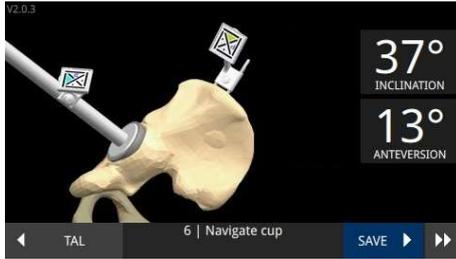


Fig 6: Navigated cup alignment during cup impaction.

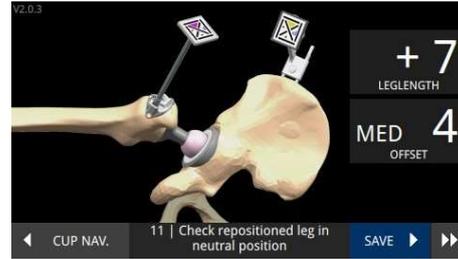


Fig 7: Leg length and offset documented after final joint reduction.

**Conclusion**

Dr. Intzoglou: "I am using the Naviswiss combined with the SuperPath Replacement for Hip Arthritis. The Naviswiss is a versatile hip navigation system, which has given me the accuracy and reproducibility as far as the acetabular cup positioning is concerned. A disadvantage of the SuperPath approach was the acetabular cup positioning; but that was before. Now, being able to combine the portable and easy Naviswiss with the SuperPath approach for the first time globally, all worries have been omitted. The combination of the SuperPath approach with the Naviswiss keeps things for me easy, reproducible and accurate. Thus, a flawless surgery and a happy patient is guaranteed!"



Fig 8: Dr. Intzoglou during the navigated THR



Fig 9: Navigated cup alignment: acetabular plane angles provides additional orientation.

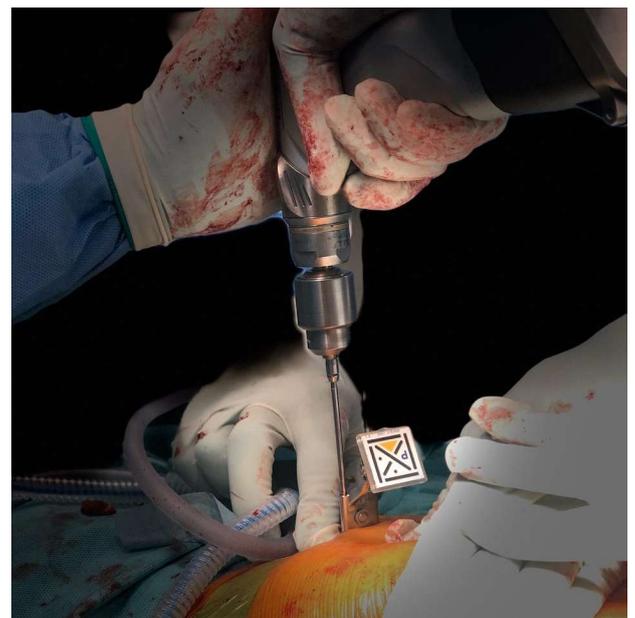


Fig 10: The highly precise Naviswiss tracking tags: minimally invasive fixation, insensitive to blood and liquids.

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