

Educational effects of using inertial portable navigation in THA

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INTRODUCTION

Precise implant positioning requires a high level of skill. In the direct anterior approach (DAA), a learning curve of approximately 100 cases has been suggested(1-3).

Navigation has been shown to improve implant placement accuracy and reduce the reoperation rate due to dislocation(4). Inertial portable navigation systems (INS navigation) offer

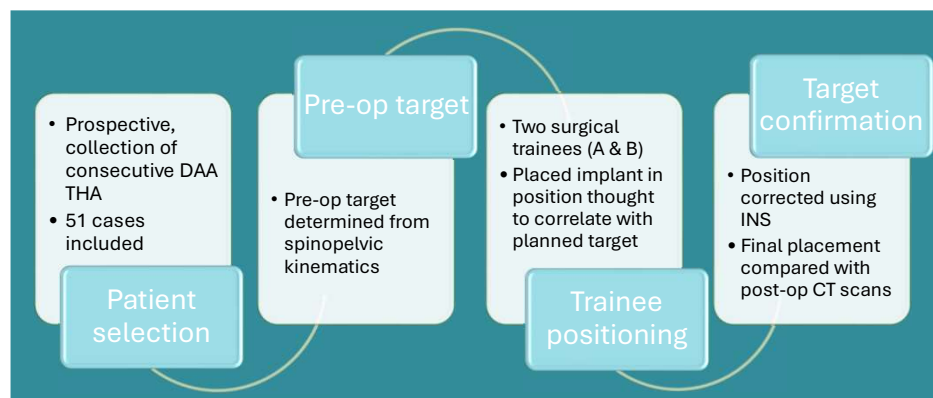
- shorter operation times
- simpler handling
- enhanced placement precision(5, 6).



Fig 1: Navbit Sprint, example of an INS.

METHODS

This study investigated whether implant placement accuracy in improved with the use of INS navigation (**Navbit Sprint®**) and examined how manual placement accuracy changed over time in orthopedic trainees.



RESULTS

Table 1. Mean errors from the target angle using manual placement and navigation.

| | Manual placement | Final placement |
|-------------|------------------|-----------------|
| Inclination | 6.33° | 1.02° |
| Anteversion | 4.49° | 1.45° |

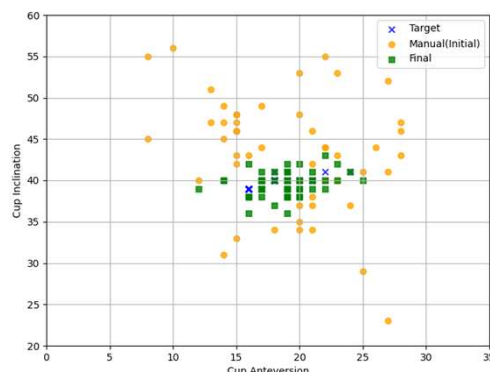


Figure 1. Scatterplot of target angles for cup placement, initial manual placement and final placement position by orthopaedic Trainee A.

Table 2. Mean manual placement errors from the target in the first and latter half of the training period, indicating a reduction in placement errors over time.

| | First half | Second half |
|-------------|------------|-------------|
| Inclination | 7.92° | 4.81° |
| Anteversion | 5.00° | 3.00° |

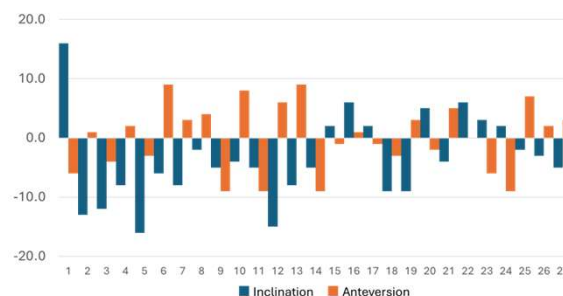


Figure 3. Implant placement errors by time for Trainee A. Both trainees showed larger errors in inclination. However, the degree of improvement varied; Trainee A showed improvement over time while Trainee B showed little improvement.

CONCLUSION

INS navigation may be a useful educational tool for a trainees performing acetabular implant placement in THA.

The use of INS appeared to improve the surgical trainee's level of accuracy in acetabular implant placement during a training rotation. Repeated use also improved manual implant placement.

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