



Does computer-assisted surgery benefit leg length restoration in THR? Navigation versus conventional freehand

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ABSTRACT

Leg length discrepancy following total hip replacement (THR) can contribute to poor hip function. Abnormal gait, pain, neurological disturbance and patient dissatisfaction have all been described as a result of leg length inequality after THR. The purpose of this study was to determine whether the use of computer navigation in THR can improve limb length restoration and early clinical outcomes. We performed a matched-pair study comparing 48 computer-assisted THR with 48 THRs performed using a traditional freehand alignment method. The same implant with a straight non-modular femoral stem was used in all cases. The navigation system used allowed the surgeon to monitor both acetabular cup placement and all the phases of femoral stem implantation including rasping. Patients were matched for age, sex, arthritis level, pre-operative diagnosis and pre-operative leg length discrepancy. At a minimum follow-up of six months, limb length discrepancy was measured using digital radiographs and a standardised protocol. The number of patients with a residual discrepancy of 10 mm or more and/or a post-operative over-lengthening were measured.

The clinical outcome was evaluated using both the Harris Hip Score and the normalised Western Ontario and McMaster Universities (WOMAC) Arthritis Index. Restoration of limb length was significantly better in the computer-assisted THR group. The number of patients with a residual limb length discrepancy greater than 10 mm and/or a post-operative over-lengthening was significantly lower. No significant difference in the Harris Hip Score or normalised WOMAC Arthritis Index was seen between the two groups. The surgical time was significantly longer in the computer-assisted THR group. No post-operative dislocations were seen.

SUMMARY

Matched pair study with a comparison of 48 computer-assisted THA (used Brainlab navigation) with 48 free-hand alignment THA surgeries. The limb length was determined pre-operatively and 6 months post-operatively.

The clinical outcome was evaluated using two different scores and revealed better outcome for navigated hips, whereas not significant.

✓ CONCLUSION

Limb length restoration significantly better in THR with computer navigation.

“[...] our results demonstrated that in THR computer navigation significantly improves the restoration of limb length.”

“In the computer-assisted group, the mean post-operative leg length discrepancy was reduced to 5.06 mm (range: 0–12) compared to 7.64 mm (range: 0–20) in the freehand group.”

Computer navigation represents practical way to achieve a more anatomical hip arthroplasty

“We believe that computer navigation of both the femoral stem and acetabular cup in THR represents a practical way to achieve a more ‘anatomical hip arthroplasty’.”