Does Accurate Anatomical Alignment Result in Better Function and Quality of Life? Comparing Conventional and Computer-Assisted TKA

Choong P.F., Dowsey M.M., Stoney J.D.

ABSTRACT

This is a randomized prospective controlled trial comparing the alignment, function, and patient quality-of-life outcomes between patients undergoing conventional (CONV) and computer-assisted (CAS) knee arthroplasty. One hundred and fifteen patients (60 CAS, 55 CONV) underwent cemented total knee arthroplasty. Three patients were lost to follow-up. Eighty-eight percent (CAS) vs 61% (CONV) of knees achieved a mechanical axis within 3° of neutral (P = .003). Aligning femoral rotation with the epicondylar axis was accurately achieved in CAS and CONV with no significant difference.

Patients with coronal alignment within 3° of neutral had superior International Knee Society and Short-Form 12 physical scores at 6 weeks, 3 months, 6 months, and 12 months after surgery. Computer-assisted total knee arthroplasty achieves greater accuracy in implant alignment and this correlates with better knee function and improved quality of life.

SUMMARY

Patients in the navigated group report a significantly and increasingly better quality of life than non-navigated patients!

This is the first randomized controlled study to compare the alignment, function and patient quality-of-life outcomes between patients who underwent conventional and computer-assisted TKA. Patients with a mechanical axis within 3° (88% of Patients from CAS group and 61% of Patients from Conventional group) demonstrated superior outcomes in two independent functional scores (International Knee Society Score (IKS) and Short-Form 12 Score) at 6 weeks, 3 months, 6 months, and 12 months following surgery.

CONCLUSION

Better mechanical alignment through CAS leads to better functional and patient quality-of-life outcome.

“(…) as a result of the proven positive correlation between the use of computer-navigation in TKA and accuracy of prosthetic alignment, we can also assert that computer-assisted TKA results in better function and quality of life for patients compared to conventional TKA”

Benefit of CAS in knee surgery

“Our results demonstrated for the first time significantly better functional scores using the IKS as early as 6 weeks postoperatively in patients with a mechanical axis within 3° of neutral”
Benefit in particular for obese patients
“93% of our obese patients in the computer-navigated group had a postoperative mechanical alignment within 3° of neutral compared to only 56% of those in the conventional group”

Longer procedure time during CAS is justifiable
“Indeed, we believe the extra 15 minutes [for CAS] to be justifiable if it resulted in better limb alignment.”