CLINICAL PAPER /

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Computer navigation in total hip replacement: a meta-analysis.

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ABSTRACT

Proponents of navigated hip arthroplasty have suggested that it may increase the precision of acetabular component placement. We conducted a systematic review and meta-analysis to evaluate the validity of this theory. We searched, in duplicate, MEDLINE, EMBASE and the Cochrane Central Register of Controlled Trials for rando-mised trials comparing the use of computer navigation with the freehand technique for acetabular cup placement within

the desired alignment. We assessed the methodological quality of the studies and abstracted the relevant data.

Tests of heterogeneity and publication bias were performed. From the three studies included, there was no evidence of heterogeneity between studies. A total of 250 patients were entered into the analysis. The beneficial odds ratio for the number of outliers was 0.285 (95% confidence interval [CI]: 0.143 to 0.569; p<0.001). We conclude that navigation in hip arthroplasty improves the precision of acetabular cup placement by decreasing the number of outliers from the desired alignment.

SUMMARY

A systematic literature review and meta-analysis was conducted to evaluate if the precision of acetabular component placement in THA is increased with using navigation.

Included were three randomized controlled trial paper with a total of 250 patients. The papers compared freehand to CT-based navigation, freehand to imageless navigation or all three techniques on patients undergoing primary THA.

CONCLUSION

Computer navigation significantly improves cup placement within desired range.

“The results of our study show that computer navigation significantly improved the surgeon's ability to place the acetabular cup within the desired alignment as defined by Lewinnek et al.”

“[...] our meta-analysis shows that computer navigation decreased the number of acetabular cups implanted outside the desired range of alignment.”

Four-fold less acetabular outliers in the navigation group

“The number of acetabular outliers in the navigation group was 15/140 (10.7%), compared to 46/110 (41.8%) in the freehand group.”