Acetabular implant position is important for the stability, function, and long-term wear properties of a total hip arthroplasty (THA).[1] Prior studies of acetabular implant positioning have demonstrated a high percentage of outliers, even for experienced hip surgeons, when conventional instruments are used.[2]

Computer navigation is an attractive tool for use in THA, as it has been shown to improve the precision of acetabular component placement and reduce the incidence of outliers.[3] However, computer navigation with imageless, large-console systems is costly and often interrupts the surgeon’s workflow, and thus has not been widely adopted.

Another method to improve acetabular component positioning during THA is the use of fluoroscopy with the direct anterior approach. Studies have demonstrated that the supine position of the patient during surgery facilitates the use of fluoroscopic guidance, thus improving acetabular component position.[4]

A handheld, accelerometer based navigation unit for use in total hip replacement has recently become available to assist the surgeon in positioning the acetabular component during anterior approach THA, potentially reducing the need for intra-operative fluoroscopic studies. We sought to compare the radiographic results of direct anterior THA performed with conventional instrumentation vs. handheld navigation to determine the accuracy of the navigation unit, and to see whether or not there was a reduction in the fluoroscopic time used during surgery. Furthermore, we timed the use of the navigation unit to see whether or not it required a substantial addition to surgical time.

Our results demonstrate that a handheld navigation unit used during anterior approach THA had no difference with regard to acetabular cup positioning when compared to fluoroscopically assisted THA, but led to a reduction in the use of intra-operative fluoroscopy time.

References: