Cup position plays an important role in the short- and long-term outcomes of total hip arthroplasty (THA). More attention should be paid to avoid malposition of acetabular components during revision THA. Imageless navigation systems have demonstrated their ability to significantly reduce the number of outliers in positioning the acetabular component in THA. In addition, the combined anteversion technique may provide more accurate mating of the femoral head and acetabular cup into a correct anteversion position. The purpose of the study is to evaluate the implant positions and clinical results in revision THA using the imageless navigation with the concept of combined anteversion.

Materials and Methods

We evaluated the implant positions and clinical results of 40 patients (24 men and 16 women) who consecutively underwent a cementless revision THA using an imageless navigation with the concept of combined anteversion. The mean age of patients was 58.4 ± 9.4 years at surgery. The mean body weight was 62.6 ± 12.6 kg and their mean body mass index (BMI) was 23.6 ± 3.7 kg/m². The imageless navigation (VectorVision, BrainLab, Heimstetten, Germany) was used to carry out the procedures. All patients were operated in lateral decubitus position.

Results

After revision THA, the average inclination and anteversion of the cup were 42.3° ± 3.1° and 25.0° ± 2.9°, respectively. The average anteversions of the revised femoral stems and the remained femoral stems were 15.3 ± 2.9° and 17.4 ± 9.7°, respectively. The combined anteversion based on Widmer’s equation was 36.1° ± 3.4°. There were no outliers in the inclination and the combined anteversion of the cup. The mean post-operative Harris hip score was 90.7. There were no dislocation and osteolysis during follow-up period. One hip was re-revised for stem loosening with late infection. In 12 hips, minor complications were observed: 3 intra-operative periprosthetic fractures, 2 nonunions of extended trochanteric osteotomy, 3 breakages of wires, and 4 heterotopic ossifications.

CONCLUSION

The imageless navigation is useful for applying the concept of combined anteversion in revision THA. This study demonstrated that the results of revision THA using imageless navigation with the concept of combined anteversion are favorable. Further studies with long-term follow-up data are warranted.