

The results of robot-assisted unicompartmental knee arthroplasty

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Introduction: After initial scepticism, UKA is increasingly accepted as a reliable procedure for unicompartmental knee osteoarthritis with the improvements in implant design, surgical technique and appropriate patient selection. In total knee arthroplasty, the alignment of leg depends on the alignment of the component. In unicompartmental knee arthroplasty, it is determined by the thickness of the implant relative to the bone excised mostly. Recently, computer assisted UKA is helpful in accuracy and less invasive procedure. We reviewed the early clinical and radiological results of robot-assisted unicompartmental knee arthroplasty using a fixed bearing design and a mobile type bearing design.

Materials & Methods: A data set of 250 cases of isolated compartmental degenerative disease that underwent robot-assisted UKA using a fixed bearing design were compared to a data set of 250 cases using a mobile bearing type design. The operations were performed by one-senior author with the same robot system. The clinical evaluations included the Knee Society Score (knee score, functional score) and postoperative complications. The radiological evaluations was assessed by 3-foot standing radiographs using the technique of Kennedy and White to determine the mechanical axis and femoro-tibial angle for knee alignment. Operative factors were evaluated including length of skin incision, operation time, blood loss, hospital stay and intraoperative complications.

Results: There were no statistically significant differences in operation time, skin incision size, blood loss and hospital stay. ($p > 0.05$) There were no significant differences in Knee Society Scores at last follow up. An average preoperative femorotibial alignment was varus alignment of -1° in both groups. Postoperative patients with fixed-bearing implants had an average $+2.5^\circ$ valgus and the patients with mobile bearing implants had $+5.8^\circ$ valgus in femorotibial alignment, which was different. ($p < 0.05$) There was one case of medial tibia plateau fracture and two cases of early tibial component loosening in fixed bearing group. And there were four cases of liner dislocation with unstable knee and three cases of early femoral component loosening in mobile bearing group. There was no intraoperative complication. The average preoperative knee score was 47.8, which improved to 88.7 in fixed bearing group and 48.5, which improved to 90.2 in mobile bearing group at last followup. The average preoperative function score was 61.6 which improved to 87.4 in fixed bearing group and 62.7 which improved to 88.6 in mobile bearing group at last followup.

Conclusion: In our early experience, two types of bearing of robot-assisted UKA groups showed no statistical differences in clinical assessment but there was statistical difference in postoperative radiological corrected alignment. But in aspect of early complications, we think that mobile bearing seems to be requiring more attention in surgery.