

AB123. 32. Robotic unicompartmental knee—implementation, accuracy and outcomes

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Background: Uni-compartmental knee replacement is a technically challenging procedure. The midterm results displayed in the joint registries are poorer when compared to total knee arthroplasty. CT based semi active robots are increasingly employed to guide the accuracy of this procedure. The purpose of this study was to examine the learning curve, radiological accuracy and clinical outcome in the first 100 robotic arm assisted cases performed for medial compartment osteoarthritis

Methods: One hundred consecutive patients undergoing medial compartment robotic assisted knee replacement by five surgeons were analysed. The mean height, age, weight, ASA and pre-operative deformity were documented. Times pertaining to set-up, surgical procedure, burring, tourniquet use and total theatre usage were recorded. Wound length and estimated blood loss were also recorded. Intra-operative surgical difficulties along with post-operative complications and length of stay were recorded. Pre- and post-operative Oxford, Western Ontario and McMaster Universities Arthritis Index (WOMAC) and Knee Society Scores were compared using a paired student's t-test. Twenty patients underwent post-operative low dose CT scans. The 3D intraoperative implant planning position was then compared to the final postoperative femoral and tibial component

position. Root mean square errors were used to quantify average alignment accuracy.

Results: The mean patient height was 1.7 m, weight 89.3 kg and BMI 30.6. Six patients were ASA grade 1, 55 patients were grade 2 and 28 patient's grade 3. The mean varus deformity was 4.5° and the mean fixed flexion deformity was 2.3°. The set up time averaged 36 min and operative ("skin to skin") time 92 min. The total theatre utilization was 136 min for single and 228 min for bilateral cases. Wound length was 104 mm and mean estimated blood loss 55 mL. Mean length of hospital stay was 1.3 days for single and 2.2 days for bilateral cases. No robotic procedures were abandoned. There was one deep venous thrombosis and no deep infections. The mean Oxford score improved from 24.5 pre-operatively to 40.7 post-operatively, $P < 0.0001$. The mean WOMAC score improved from 40.5 pre-operatively to 12.9 post-operatively, $P < 0.0001$. The mean KSS knee score improved from 52.1 to 91.57 and the KSS functional score from 56.2 to 80.6, $P < 0.0001$. Root mean square errors for implant position averaged less 3 degrees in all planes.

Conclusions: Our data confirms the safe introduction of robotic technology. Substantial reductions in operating theatre utilization and skin to skin time were observed. No serious adverse events were recorded. Robotic assisted medial compartment knee replacement can achieve excellent early clinical and functional results. The high levels of accuracy demonstrated with this technology may help to reduce the rates of early failure associated with malalignment, aseptic loosening, polyethylene wear and disease progression in the non-involved compartment.

Keywords: Robotic; assisted; medical compartment; knee; replacement

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