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MAKOplasty – Radiological accuracy and clinical outcomes

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Introduction: Uni-compartmental knee replacement with standard instrumentation has demonstrated inconsistent long-term survival. CT based semi active robots have recently become popular to assist in guiding the accuracy of this procedure. The purpose of this study was to examine the implant accuracy and short-term patient outcome using this new technology.

Methods: Fifty consecutive patients undergoing medial compartment robotic assisted knee replacement were analyzed. There were 29 males and 21 females with a mean age of 63 years. The mean height, weight, ASA and pre-operative deformity were documented. Pre- and postoperative Oxford, 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 1.72 m, weight 89.3 kg and BMI 29.9. Seven patients were ASA grade 1, 29 patients were grade 2 and 14 patients were grade 3. The mean varus deformity was 4.4° and the mean fixed flexion deformity was 2.1°. The mean Oxford score improved from 24.5 pre-operatively to 38.3 post-operatively $p < 0.0001$. The mean WOMAC score improved from 39.1 pre-operatively to 13 post-operatively $p < 0.0001$. The mean KSS knee score improved from 50.1 to 80.2 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.

Conclusion: 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.

Recent Publications

1. Fives C, O'Neill C J, Murphy R, Corrigan M A, O'Sullivan M J, Feeley L, Bennett M W, O'Connell F, Browne T J (2016) When pathological and radiological correlation is achieved, excision of fibroadenoma with lobular neoplasia on core biopsy is not warranted. *Breast* 30:125-129.
2. Brennan SA, O'Neill CJ, Tarazi M, Moran R (2013) Bilateral neck of femur fractures secondary to seizure. *Practical Neurology* DOI:10.1136/practneurol-2013-000669.
3. Brennan SA, Devitt BM, O'Neill CJ, Nicholson P (2012) Periprosthetic fractures in the resurfaced hip-A case report and review of the literature *Injury* 44(2).

Biography

Cathleen O'Neill is currently employed as a Senior House Officer. She is Core Trainee in Year 1 in the Department of Orthopaedics, Cork University Hospital, Cork, Ireland. She has completed her BSc in Physics in 2004. She did her MSc in Medical Physics in 2005. She did her MRCS in 2017 and currently working as Senior House Officer in Cork University Hospital in Ireland.

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