

Robot Assisted Hip Replacement

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ROBODOC system is the first active robot that was designed to reduce potential human errors in performing cementless total hip arthroplasty (THA). We introduced this system and conducted several clinical studies since 2000. We showed that the preoperative planning based on CT images on the ORTHODOC helped surgeon quite a lot to optimize the plan by checking the design, size and position of THA implants three-dimensionally^{1,2}). In primary THA, the milling preparation of the femur with the ROBODOC prevented a high grade of intraoperative pulmonary embolism observed by transesophageal cardioechogram³). It also showed the better fit and alignment of the femoral component than that of the manual procedure⁴). The patients who underwent THA with the ROBODOC had no intraoperative fracture and they showed better early clinical scores than those of the manual procedures⁵). Our DEXA study confirmed that the patients of the ROBODOC THA revealed less stress shielding pattern of the femur than the patients of the manual procedure⁶). Now we followed the initial cases with the two pin registration technique of the ROBODOC for five to seven years and they still maintained high clinical hip scores and little stress shielding on x-rays. We also introduced the pinless registration method of the ROBODOC and the accuracy of the femoral milling was as same as the pin-based method. The ROBODOC pin-based method is still important because it can be used for cement removal for revision cases.

References

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