

Role of Technology in Total Knee Arthroplasty: Current and Future Perspectives

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Technology is the branch of knowledge dealing with engineering or applied sciences. It is devoted to creating tools, processing actions and extracting of materials. In the field of medical sciences technology is playing very important role and making things much easier as well as effective, its use in Total Knee Arthroplasty is not an exception. This editorial article focuses on role of technology in TKA so far and its future perspectives.

In the past few decades several innovative techniques involving technology have been developed to improve the accuracy and precision of total knee arthroplasty, with anticipated benefits over traditional TKA Techniques. The important technologies involved are computer assisted navigation, patient-specific instrumentation, and robotic-assisted total knee arthroplasty. Computer assisted surgery (CAS) was used to improve the positioning of implants during total knee arthroplasty (TKA). It has been reported that computer assisted navigation reduced the outliers of alignment and component malpositioning. However, additional sophisticated studies are necessary to determine if the improvement of alignment will improve long-term clinical results and increase the survival rate of the implant [1].

As Mattei, *et al.* literature does not suggest PSI techniques as a gold standard in TKA, and therefore it cannot be recommended as a standard technique in standard, not complicated primary TKA. Moreover, literature does not underline any improvement in components alignment, surgical time, blood loss or functional outcomes. Nevertheless, many patients who underwent TKA suffered a previous trauma. In case of deformities, like femoral or tibial fractures healed with a malalignment, preoperative planning may result difficult, and some intra-operative technical difficulties can occur, such as the use of intra-medullar rod. In these selected cases, PSIs may be very useful to avoid errors in alignment and planning [2].

The potential for robotic surgery to improve the accuracy and precision of TKA was introduced in reports describing the early results of CAS navigation. It has been also reported that no significant differences in unicompartmental arthroplasty component position, fixation, or clinical outcomes. Improvement has been reported with more recent technology with improved component alignment, ability to restore flexion-extension gap relationships, and reduction in notch avoidance among robotic-assisted TKA. However, these benefits have generally been achieved with substantially increased operative time. As experience with these technologies improves, a decline in operative time would be expected [3].

To conclude with, the future role of the technology in TKA should be more focused on minimally invasive surgery as well as implant development in terms of durability which seems to be less addressed area. More improvements in computer assisted navigation and robotic assisted surgery is also expected in near future. Most importantly orthopedic surgeon's experience, adaptability, and knowledge of technological advances are most essential for successful TKA.

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