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Original Article

Alignment of the tibial component in total knee arthroplasty procedures using an intramedullary or extramedullary guide: double-blind randomized prospective study☆

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ABSTRACT

Objectives: To evaluate the results obtained through using an intramedullary or extramedullary guide for sectioning the tibia in total knee arthroplasty procedures, with a view to identifying the accuracy of these guides and whether one might be superior to the other.

Methods: This was a randomized double-blind prospective study on 41 total knee arthroplasty procedures performed between August 2011 and March 2012. The angle between the base of the tibial component and the mechanical axis of the tibia was measured during the immediate postoperative period by means of radiography in anteroposterior view on the tibia that encompassed the knee and ankle.

Results: There was no demographic difference between the two groups evaluated. The mean alignment of the tibial component in the patients of group A (intramedullary) was 90.3° (range: 84–97°). In group B (extramedullary), it was 88.5° (range: 83–94°).

Conclusion: In our study, we did not find any difference regarding the precision or accuracy of either of the guides. Some patients present an absolute or relative contraindication against using one or other of the guides. However, for the other cases, neither of the guides was superior to the other one.

☆ Work developed in the Hip and Knee Surgery Group of Hospital de Clínicas, Universidade Federal do Paraná, Curitiba, PR, Brazil.

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Alinhamento do componente tibial em artroplastia total do joelho com o uso de guia intramedular ou extramedular: um estudo prospectivo, randomizado, duplo cego

Palavras-chave:
Artroplastia
Joelho
Instrumentação
Osteoartrite do joelho

RESUMO

Objetivos: Avaliar os resultados obtidos com o uso de guia intramedular ou extramedular para o corte tibial em artroplastias totais do joelho, com vistas a identificar sua acurácia e a superioridade de um em relação ao outro.
Métodos: Estudo prospectivo, randomizado, duplo cego de 41 artroplastias totais de joelho feitas entre agosto de 2011 e março de 2012. Foi medido o ângulo entre a base do componente tibial e o eixo mecânico da tíbia no período pós-operatório imediato por meio de radiografia em incidência anteroposterior da tíbia que englobou joelho e tornozelo.
Resultados: Não houve diferença demográfica entre os dois grupos avaliados. O alinhamento médio do componente tibial nos pacientes do grupo A (intramedular) foi de 90,3° (84°-97°). No grupo B (extramedular), foi de 88,5° (83°-94°).
Conclusão: Não encontramos, em nosso estudo, diferença quanto à precisão ou acurácia de qualquer um dos guias. Alguns pacientes apresentam contraindicação, absoluta ou relativa, para o uso de um ou outro guia. Todavia, para os demais casos, não há superioridade de algum deles.

Introduction

Currently, the number of total knee arthroplasty (TKA) procedures performed is increasing greatly, influenced by the aging of the population, increasing numbers of indications and larger numbers of procedures performed on young patients.[1–3] Thus, the search for better clinical results and longer survival of implants has become the subject of many studies on this topic.

The long-term results from TKA are influenced by several factors, such as patient selection, implant characteristics and surgical technique.[4] Regarding the technique, one factor that is believed to have an important role is the alignment of the lower limb, with regard to restoration of the mechanical axis, and especially, an adequate angle for the tibial component[4–8] (Fig. 1). Several authors have correlated an angle of 88–92° in the coronal plane, between the tibial plateau and the mechanical axis of the tibia, with better results and greater survival of the implant.[5,7,9]

Technological advances and the evolution of surgical instruments and components have enabled greater intraoperative precision and, through this, greater possibilities of achieving positioning and alignment closer to what would be considered ideal. In this regard, the guides used for the femoral and tibial cuts, which may be intra or extramedullary, are of great importance. For the femur, the standard is an intramedullary orientation in most cases. However, for the tibia, there is no consensus regarding the best reference point to use.[5–8]

We conducted the present study with the aim of comparing the alignments of tibial components obtained by means of intra and extramedullary guides, in cases of TKA.

Materials and methods

The present study was approved by our institution's ethics committee for research on human beings. For this study, we selected patients with an indication for TKA who fulfilled the following inclusion criteria: primary operation; without deformities of the tibia in the sagittal or coronal plane; without presence of osteosynthesis material that would impede the passage of the intramedullary guide; and without severe

Fig. 1 – Radiographs in anteroposterior view.