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Original Article

The use of tourniquet during total knee replacement in patients with and without popliteal artery calcification☆

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ABSTRACT

Objective: Identify the clinical and surgical complications associated with the use of a tourniquet in total knee arthroplasty in patients with or without calcification of the popliteal artery.

Methods: The study was performed retrospectively, analyzing 58 patients with calcification of the popliteal artery and 57 patients as a control group.

Results: The case group patients were significantly older than patients in the control group; however, this had no impact on the clinical outcome in the analyzed period.

There were no complications during surgery in the groups studied, as there were no statistically significant differences between the incidence of local or systemic intercurrences in the analyzed period.

Conclusion: This study found low rates of complications in patients undergoing total knee arthroplasties with use of a tourniquet, with or without calcification of the popliteal artery.

O uso do manguito pneumático em pacientes submetidos a artroplastia total do joelho com ou sem calcificação da artéria poplítea

Palavras-chave:
Artroplastia do joelho
Complicações pós-operatórias
Torniquetes
Artéria poplítea

RESUMO

Objetivo: Identificar as complicações clínicas e cirúrgicas associadas ao uso de torniquete na artroplastia total de joelho em pacientes com ou sem calcificação da artéria poplítea.

Métodos: O estudo foi feito de modo retrospectivo, analisou 64 pacientes com calcificação da artéria poplítea e 57 pacientes como grupo controle.

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Resultados: Os pacientes do grupo de casos eram significativamente mais velhos do que os pacientes do grupo controle. Entretanto, tal fato não teve repercussão quanto ao desfecho clínico no período analisado. Não houve complicações durante o ato cirúrgico nos grupos estudados, bem como não houve diferenças estatisticamente significantes entre a incidência de intercorrências locais ou sistêmicas no período analisado.
Conclusão: O presente estudo observou baixos índices de complicações em pacientes submetidos a artroplastia total do joelho com uso de torniquete com ou sem calcificação da artéria poplítea.

Introduction

Total knee arthroplasty (TKA) is a highly complex orthopedic procedure indicated in the treatment of patients with advanced knee osteoarthrosis. The primary objective of the procedure is pain relief; its secondary objectives are mechanical alignment of the lower limb promoting a significant improvement in the patient's quality of life.[1,2]

Current studies demonstrate high satisfaction and functional improvement rates in patients who undergo TKA, presenting good and excellent results in more than 90% of cases in long term results.[3,4]

Despite the high success rate of the procedure, 11–20.8% of the patients develop perioperative complications.[5,6] Among the most common complications are those related to the surgical wound, thromboembolic disease, infection, neurovascular injury, periprosthetic fracture, injury of the extensor mechanism, and joint stiffness.[7,8]

A pneumatic cuff is routinely used during knee replacement surgery. The advantages of its use are promoting a cleaner operative field, lower perioperative bleeding, better quality of implant cementation, and faster surgery[9]; it also decreases the surgeon's risk of acquiring diseases such as AIDS or hepatitis. However, its use has been associated with the incidence of neurapraxia, vascular injury, muscle damage, postoperative pain, cardiovascular alterations, and wound healing complications.[9]

In TKA, the tourniquet is applied on the thigh to occlude the femoral artery. Typically, the pneumatic cuff on the lower limb is inflated to 100 mmHg above systolic pressure.[10] The literature tends not to recommend the use of a pneumatic cuff in patients with popliteal artery calcification.[11–14]

Atherosclerosis would be the most plausible explanation for artery calcification. Calcium deposits in the intima layers of the arteries could lead to this alteration.[9,14] The artery is elastic and calcification can make the vessel less compliant and more vulnerable to acute occlusion or rupture of its wall.[9,13,15–17]

Radiographic examination of the knee is a simple, inexpensive imaging method required for every TKA candidate. By this exam, the degree of joint degeneration can be measured, and the presence or absence of popliteal artery calcification can be verified.[13,17]

This study is aimed at identifying the clinical and surgical complications in patients with or without popliteal artery calcification who underwent TKA with the use of a tourniquet.

Material and methods

After approval of the study protocol by the research ethics committee of the institution (CAAE 44349315.1.0000.5273), a retrospective observational study was conducted and data were collected through the review of medical documents (medical records and radiographs). The analysis was performed in the database of the institution by a physician specialized in orthopedics and traumatology.

The study included all patients who underwent TKA between January and December 2013 and presented calcification at the knee joint identified on preoperative X-ray films (64 patients; Fig. 1). Exclusion criteria were the need for a more constricted implant, a follow-up time of less than six months, or incomplete medical records; six patients were excluded from the study.

Fig. 1 – Lateal view preoperative radiograph.

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