Total Knee Arthroplasty in an Outpatient Setting: Is It Possible?

Artroplastia Total do Joelho em Ambulatório: É Possível?

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According to the latest data on surgical procedures, approximately 7000 total knee arthroplasties were performed in public hospitals in Portugal in 2019.[1] This procedure is classically performed in an inpatient setting with an average length of stay of 4 to 5 days, corresponding to a total of 28 000 to 35 000 hospitalisation days.

In the United States, in 2017 a total of 700 000 knee replacements were performed, and the forecast indicates an annual number of around 3 million by 2030.[2] These numbers show that the burden of this procedure on hospitalisations is currently significant and is expected to increase markedly in the coming years, potentially straining healthcare structures. This pressure on healthcare units will inevitably lead to successive postponement of these interventions to provide care to urgent cases in inpatient settings.

Total knee arthroplasty is traditionally performed as an inpatient procedure because it typically involves significant post-operative pain and results in a high level of patient dependency, limiting their mobility and ability to carry out daily activities. Surgeons also feel that inpatient care allows for better early post-operative control and detection of potential warning signs.

Transitioning to outpatient surgery optimizes medical facilities and reduces the costs associated with the procedure. From the patient's perspective, it reduces the risk of acquiring nosocomial infections and promotes a quicker return to their familiar environment, particularly beneficial for the elderly.

Shifting to outpatient surgery primarily involves the patient and their concerns, including post-operative pain, potential slower recovery at home, uncertainty about early detection of complications, and fear of high levels of dependency, requiring support for basic tasks.

Published data demonstrates that by addressing these concerns, the vast majority of patients choose early discharge to their homes[3] and over 93% of patients would undergo the surgery again on an outpatient basis, emphasizing a highly satisfying experience.[4]

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From the surgeon's perspective, the main concerns are post-operative pain control and complications such as bleeding/anaemia, thromboembolic events and infection.

There are several studies attesting to the safety of performing the procedure on an outpatient basis,[5-7] showing that there is no higher number of complications in this setting when the patient selection process is judicious. Therefore, it is crucial to use patient selection tools that are capable of stratifying patient risk and suitability for outpatient knee arthroplasty. Currently, the Outpatient Arthroplasty Risk Assessment scale appears to be the best tool to achieve that.[8]

Implementing outpatient knee arthroplasty is an extremely complex process, requiring consideration of various factors. Firstly, the driving force behind this endeavour must be the motivation of the professionals involved and their capacity to work as a team. These are essential conditions. It is also critical that all parties involved are coherent, convey the same message, and are fully available for extensive interaction with the patients throughout the process. All stakeholders must be included in structuring an outpatient knee arthroplasty project. Although their contribution occurs at different stages of the process, all steps must be seamlessly interconnected, forming an uninterrupted sequence.

Considering the various intervention phases, the process can be broadly divided into three main moments: pre-operative, peri-operative, and post-operative.

Pre-operative:

Proper patient selection is crucial to avoid unforeseen issues during the procedure. Medical and psychosocial conditions must be taken into account during the selection process.[9] Managing patient expectations is also vital, as an apprehensive patient is a significant predictor of failure. Family involvement, ensuring a robust family support network, is also paramount for success.

Clinical optimisation of patients before surgery leads to better outcomes and fewer surgical complications.[10] Implementing smoking cessation programs, ensuring good metabolic control, promoting appropriate nutritional supplementation, among other strategies, yield better results.

It is also essential to define a physical rehabilitation program starting before the surgical procedure. This approach allows the patients to become familiar with the exercises and gestures they will have to perform after surgery. This work on strengthening, neuromuscular coordination, building muscle memory, transfer training, gait training, etc., is associated with shorter hospital stays.[11]

Peri-operative:

Surgical teams should include medical and nursing staff that are highly specialized in total knee arthroplasty, to achieve higher efficiency and safety. The procedure will be carried out more quickly, reducing the risk of infection, surgical stress, and the need for pharmacological intervention.

From a technical standpoint, the surgeon should favour options that minimize blood loss, promote earlier muscle activation and joint mobilisation, and shorter hospitalisation time. Subvastus or Mini-Midvastus approaches should be preferred over conventional approaches.[12] Minimal synovectomy and the use of intra-articular tranexamic acid are recommended.[13]

More recent options on wound closure, such as the use of intradermal sutures covered with a self-adhering mesh and a liquid adhesive, allow for direct visualisation of the wound without the need to manipulate it for the first two to three weeks. This reduces the need for dressing care without jeopardizing the ability to assess the evolution of the surgical wound.

The advent of robotics in total knee arthroplasty[14] represents a promising solution with attractive results. It may lead to less surgical trauma, especially regarding the manipulation of soft tissues, resulting in better patient outcomes in the immediate post-operative period.

Close collaboration with the anaesthesiologist is essential. Ideally, locoregional anaesthesia with short-acting motor-blocking drugs should be preferred. Proper blood pressure control, pain management, measures to prevent nausea and vomiting, and minimizing the use of opioids and benzodiazepines are critical issues at this stage. The anaesthetic approach should be optimised and standardised so that patients arrive at the post-anaesthesia care unit (PACU) in a uniform and predictable condition.

In the PACU, patients should be closely monitored and optimized, with particular attention to preventing nausea and vomiting, the main causes of delayed discharge. After radiographic knee assessment, patients should be evaluated by a physiatrist, initiating physical rehabilitation exercises and gait training.

Discharge home may occur when specific criteria are met, namely hemodynamic stability, tolerance to oral feeding, adequate pain control with oral medication, ability to walk and

transfer independently. Discharge should be approved by the surgeon in charge, the anaesthesiologist, the physiatrist, and, if possible, by the doctor who will follow-up closely at home.

Post-operative:

It is essential to develop a home care unit that follows up the entire in-hospital process. This unit should include a doctor, nurse and physiotherapist. Besides human resources, it should be equipped with telemonitoring tools to evaluate parameters such as heart rate, blood pressure, oxygen saturation, temperature, walking distance, exercises performed, mobility of the operated knee, etc. This real-time continuous evaluation increases the safety of the process and may even lead to closer monitoring than the one provided during inpatient care. Telerehabilitation is also an asset and shows promising results. It empowers the patient to perform supervised rehabilitation at home using digital tools, remotely guided by rehabilitation professionals, resulting in comparable functional outcomes to traditional physiotherapy methods.[15] When telerehabilitation is not possible, a team of physical rehabilitation specialists should carry out the rehabilitation at the patient's home.

The home care unit should assess the patient daily. Whenever clinically justifiable, besides the measures described, it should adjust the ongoing treatment, provide wound care and take samples for analysis. The aim of this unit is to provide the patient a comfortable, secure and peaceful experience in their own environment, to ensure a calm and balanced post-operative period.

Considering all the parameters mentioned above, there is no doubt that the implementation of outpatient knee arthroplasty is absolutely feasible. However, it requires a well-structured project and a team with high standards. In response to the title "Total Knee Arthroplasty in an Outpatient Setting – Is It Possible?":

Certainly! There are, however, three fundamental considerations:
Patient safety is the top priority!
Patient selection is the critical step for success!
Team motivation is crucial to get started!

Responsabilidades Éticas

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