بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / سامية زكى يوسف

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد

Total Knee Arthroplasty vs Uni Compartment Knee Arthroplasty in Management of Anteromedial Knee Osteoarthritis

Thesis

Submitted for Partial Fulfillment of M.D. Degree in Orthopaedic Surgery

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2022

سورة البقرة الآية: ٣٢

Acknowledgment

First and foremost, I feel always indebted to **ALLAH**, *the Most Kind and Most Merciful.*

I'd like to express my respectful thanks and profound gratitude to **Professor/ Wael Samir Abdel Megeid,** *Professor of Orthopaedic Surgery Faculty of Medicine – Ain Shams University for his keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.*

I am also delighted to express my deepest gratitude and thanks to **Professor / Sherif Mostafa Abdeldyem,** *Associate Professor of Orthopaedic Surgery Faculty of Medicine – Ain Shams University, for his kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

Special thanks and deepest gratitude to **Professor / Zeiad M. Zakaria,** *Associate Professor Orthopaedic Surgery Faculty of Medicine – Ain Shams University, for his good support, continuous supervision and unlimited help during this work.*

I wish to introduce my deep respect and thanks to **Professor/ Radwan Gamal El Deen Abdel Hamid,** *Associate Professor of Orthopaedic Surgery Faculty of Medicine – Ain Shams University, for his kindness, supervision and cooperation in this work.*

I am deeply grateful for **Doctor / Mohamed El Sayed Awad,** *Lecturer of Orthopaedic Surgery Faculty of Medicine – Ain Shams University, for his valuable help and guidance.*

Ahmed Alkersh

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List of Abbreviations

Abb.	Full term

ACL..... *Anterior cruciate ligament*

AMOA..... *Anteromedial osteoarthritis*

AP ..... *Anteroposterior*

HTO..... *High tibial osteotomy*

KSS..... *Knee society score*

MCL..... *Medial collateral ligament*

OA..... *Osteoarthritis*

OMERACT..... *Outcome Measures in Rheumatology Trials*

RCT ..... *Randomized clinical trial*

RCT ..... *Randomized controlled trial*

TKA..... *Total knee arthroplasty*

TOPKAT..... *Total or partial knee arthroplasty trial*

UKA ..... *Unicompartement knee Arthroplasty*

WORQ ..... *Work, osteoarthritis, or joint replacement questionnaire*

INTRODUCTION

Knee osteoarthritis (OA) is attributable to mechanical events that increase contact pressure to the articular cartilage. This contact stress ends by destruction of the cartilage first then the bone. There is a special type of knee OA in which the destruction is localized in the anteromedial compartment of the knee joint. Erosion of the cartilage begins in the anterior half of the medial tibial plateau, with preservation of the cartilage in the posterior third. Anteromedial knee osteoarthritis is also associated with a lesion on the distal femoral condyle, and an intact anterior cruciate ligament (ACL). Deficient ACL knee leads to a progression of the disease to all knee compartments. [1]

A huge number of patients with knee osteoarthritis are in need to total knee arthroplasty (TKA). [2] An improved surgical technique, safe anesthesia, effective pain control, and accelerated rehabilitation due to modern implant design have improved predictable outcomes in TKA. [3] Recently, patients are doing TKA at younger ages and early stages of the disease to lessen the pain and preserve their daily life activities with a good quality.[4] However, 15%–20% patients are unsatisfied with their post TKA outcomes.[4,5]

As regard Unicompartement knee arthroplasty (UKA) which has excellent functional outcomes and became a good option in management of anteromedial osteoarthritis [6,7], there are persisting concerns regarding its durability and the need for

revision surgery.[8,9] There are different reasons that make only a few arthroplasty surgeons offering UKA to their patients, a limited numbers of eligible candidates, complex surgical technique, and steep learning curve.[10,11] More than 30% of patients who did TKA are candidates for UKA, but only 5% of all knee replacements performed are UKA.[12]

UKA has potential advantages compared to TKA which are rapid recovery, better postoperative rehabilitation, more physiologic gait, earlier discharge to home. Additionally, it offers less blood loss, postoperative morbidity, and perioperative costs. Previous literature has demonstrated UKA as the preferred method for surgeons attempting to maintain native joint mechanics, preserve bone, and allow for easier revision surgery in comparison to TKA. Therefore, surgeons recommend UKA to young, active patients who may be expected to require prosthesis revision in their lifetime.[13]

Research hypothesis:

- **Alternative hypotheses:** UKA has better functional outcome than TKA in management of isolated anteromedial knee osteoarthritis.

- **Null hypothesis:** Both UKA and TKA has same functional outcome in management of isolated anteromedial knee osteoarthritis.

AIM OF THE WORK

Our aim was to find an answer to the following questions:

1- Is there a difference in the functional outcome after either TKA or UKA in treatment of anteromedial knee osteoarthritis?

2- Is there a difference in the time that the patient can move without support after either UKA and TKA?

3- Is there a difference in postoperative complications between TKA and UKA?

Applied Anatomy and Pathology of the Anteromedial Knee Osteoarthritis

The knee is a complex modified hinge joint with the greatest range of movement in flexion and extension about the sagittal plane, as well as varus and valgus rotation about the frontal plane. Also, it facilitates the medial rotation at the end of the knee flexion and the lateral rotation at the terminal extension of the knee both at the transverse plane. The knee maintains stability and control during a variety of loading situations.[14]

The knee consists of two main joints: the femorotibial joint and the patellofemoral joint, which allow the knee to move in three different planes (sagittal, transverse, and frontal). This offers a six degrees of freedom range of motion, including flexion, extension (sagittal planes), internal, external rotation (transverse plane), varus, and valgus stress (frontal plane).[14]

Osteoarthritis (OA) is the most common arthritic condition which has considerable social and economic impact. It is characterized by altered joint anatomy, especially the loss of articular cartilage. Pathologically OA may be defined as a condition of synovial joints characterized by focal loss of articular cartilage and simultaneous proliferation of new bone (osteophytes) with the remodeling of joint contour.[15]

The precise mechanism of cartilage degradation in osteoarthritis is still unclear, but a complex interplay of genetic, environmental, metabolic and biochemical factors is proposed.[16]

Knee osteoarthritis (OA) is a complex clinical scenario where many biological and mechanical factors influence the severity of the articular degenerative changes.[17] Cartilage degenerative changes are due to genetic (collagen gen II, cytokine gene pro/anti-inflammatory, metabolism gene chondrocyte/bone, etc) and biomechanical (joint instability, trauma, overweight, daily living activities, etc.) factors, and age progression, which all lead to matrix degradation and abnormal chondrocyte metabolism.[17] The function of knee capsulo-ligamentous structures has been studied to understand the wear pattern of the joint cartilage.[18] Knee varus/valgus deformity, anterior cruciate ligament (ACL) and meniscus integrity are all factors that contribute to determining abnormal kinematics and excessive joint loading.[19]

The knee has three compartments, all of which can suffer from OA and there can thus be seen tri-, bi- or uni-compartmental OA.[20] The bicompartmental OA can occur in three combinations, where the combination of medial and patellofemoral involvement is the most frequent.[20] In most patients with knee unicompartmental OA, the arthritis is confined to the medial compartment, where it is most often anteromedial (AMOA).[21]