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Case Report

Functional and Safety Outcomes in Same Stage Bilateral Total Knee Replacement in A 54-Year-Old Patient with Severe Knee Osteoarthritis and Bilateral Valgus Deformity

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ABSTRACT

Total knee replacement or arthroplasty is a major orthopaedic procedure that has developed through the last decade.

Currently, lots of arguments exist between performing simultaneous or a staged bilateral total knee arthroplasty.

The objective of this case Report is to look into the functional and safety outcome of same stage bilateral total knee replacement in a patient with severe bilateral knee Osteoarthritis and valgus deformity kellgren and lawrence grade 4.

Keywords: Total Knee Replacement; Bilateral Total Knee Replacement; Knee Osteoarthritis

Introduction

Presently, the number of total knee replacement performed yearly has been on the rise [1]. Total knee replacement (TKR) improves function and reduces pain in patients with severe knee Osteoarthritis [2,3,4].

Simultaneous bilateral total knee total knee replacement is done for both knees at a single surgery and hospital stay. One important assessment used to measure pain and function for knee Osteoarthritis is the Oxford knee score which is also an important tool following surgery [5].

Nonetheless, performing a simultaneous bilateral total knee replacement is debatable because of increased complexity and complications such as deep venous thrombosis and consequently pulmonary embolism [6,7].

In a comparative study done simultaneous bilateral TKR can be offered to both low and high risk patients and has an expected rate of complications similar to that of unilateral TKR [8].

Also, same stage-bilateral TKR is more cost effective and offers better rehabilitation for the patient with severe bilateral knee Osteoarthritis [9]

Case Report

A retired seamstress presented at the orthopaedic clinic of Babcock University Teaching Hospital with bilateral knee pain of five (5) years duration which was insidious in onset worsened with physical activity and associated with progressive swelling worse on the Right knee and a pain severity score of 8/10 on both knees.

There was no history suggestive of a blunt trauma to the knees, nil history of fever nor weight loss.

The pain however got worse over the last one year with associated progressive valgus deformity on both knees preventing her from engaging in regular daily activities such as cooking, going to the market resulting in her near sedentary lifestyle.

She previously took off the counter pain medications to relieve of the pain with no significant result.

She had an appendectomy about 30 years ago which was not adversely eventful.

She's a known a hypertensive patient diagnosed > 10 years ago with poor drug compliance, positive history of peptic Ulcer disease, not diabetic, not Asthmatic.

On examination, she had a bilateral valgus deformity on both knees, with no visible scar or scarification mark. Her gait was unsteady and used a walking stick for support.

On palpation she had a bilateral joint line tenderness, crepitus was positive on both knees, range of motion was limited and reduced muscle bulk at the thighs bilaterally. Valgus stress test positive on the right knee.

She had a Q-angle of 50°degrees at the right knee and 45° degrees on the left knee respectively and an inter-malleolar distance of 25cm.

She had no lower back tenderness, no pelvic tenderness with normal range of motion at the Right and left hip joint, normal sensation and muscle power, deep tendon reflexes were all also normal and comparable at the lower limbs.

Image 1: Showing the severe bilateral knee valgus deformity Pre-Op

Other blood investigation done such as Uric acid level was normal. A risk evaluation for developing Deep venous thrombosis post-operatively was carried because the patient had a long standing uncontrolled high blood pressure with an increased risk of peripheral vascular disease with findings not suggestive of her developing a DVT.

Review of the x-rays of both knees showed large bilateral knee osteophytes, reduced joint space worse on the Right knee joint medially, subchondral sclerosis and Subchondral cyst.

Anterior Posterior View

Right Knee Lateral View

Left Knee Lateral View

Description of The Procedure

The patient was wheeled into the operating theatre and a combined spinal and epidural anaesthesia was initiated by the Anaesthetist. Both her lower limbs were draped and prepped in a sterile manner. The right lower limb exsanguinated and the tourniquet pressure was inflated to 300mmhg lasting for 2 hours.

A median skin incision was made and subcutaneous tissues were then incised. Medial para-patellar arthrotomy was then performed exposing the femur. The cutting guides were then placed into position and the distal and the chamfer cut, as well as the notch cuts, were then performed. Attention was then turned to the tibia and the tibia dissection was then performed. The dissections were then checked with alignment guides. The trial tibia plate was placed into position. Lamina spreaders were used medially and laterally and then posterior osteophytes were then removed .

The remainder of the meniscus and the cruciate were then removed. Gap balancing was performed and was found to be correct. The trial femur was then placed into position followed by the trial tibia and the trial polyethylene was then placed into position. The knee was then was then ranged through a full range of motion with patellar tracking and knee stability all stable. All trial components were then removed. Thorough lavage was given. The femoral component was was cemented into position and excess cement was removed. The tibia component was cemented into position and excess cement was removed. The polyethylene was then placed into position. The knee was then reduced and held in full extension.The medial parapatellar arthrotomy was then closed and the closure was done in layers. The skin was closed with staples The knee was reduced and Tourniquet was let down and the attention was turned towards the left knee joint.

The left knee was replaced in a similar manner using customized implants.
After the procedure ,the patient was transferred to the post-operative care unit in stable condition.

Assessing the patient post-operatively she was noticed to have Q angle of 15 degrees at the right knee and 12 degrees at the left knee and ambulated out of bed on Post operative day 2.

Post-Operative X-Ray

Discussion

Patients who need bilateral total knee replacement should be assessed using the Oxford knee score and venous thrombosis risk factor assessment which would increase better patient outcome both pre-op,intra-op and post-operatively which is patient targeted.

A same stage bilateral total knee replacement has many advantages as less anaesthesia is required , shorter hospital stay with its antecedent reduction of hospital acquired infections and possible implant sepsis will be kept at bay[10].

The prevalence of thromboembolic disease ,infection and cardiovascular accidents are not significantly different in both simultaneous or staged TKR. Hersekii et al. Proposed that intensive care unit days and peri-operative complications were about the same in both single and two staged operation[11]

Patient satisfaction which is core of any surgical operation are comparable or better in patients undergoing bilateral Total knee replacement than unilateral total knee replacement and it is achieved with no additional cost [12,13].

Total knee replacement in patients who have valgus deformities is still a challenge for orthopaedic surgeons has only 10% of patients who undergo total knee arthroplasty have valgus deformity with very few studies done to further explain patients functional outcomes as most patients with severe knee Osteoarthritis have a varus knee deformities [14].

The decision was made to have a same stage bilateral total knee replacement in view of the fact that the patient had a bilateral valgus

deformity with Q angles exceeding 40° for both knees respectively while considering her functional outcome and rehabilitation.

This was done as a staged -bilateral total knee replacement would significantly reduce her functional status during her physiotherapy post-surgery due to the severe valgus deformity.

Conclusion

Simultaneous bilateral total knee replacement has about the same functional outcome like the staged -total knee replacement however the former should be patient selective while taking into consideration all necessary complications that could potentially arise.

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