
Total Knee Replacement in Tobruk Medical Center in, Libya

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ABSTRACT: The aim of this study to investigate about the causes that lead to total knee joint replacement operation, especially the operation that is performed in Medical Tobruk Center where there are many reasons that cause problem in Knee joint but in tobruk . And the knee joint ,which is one of the largest and most complex joints in the human body.

There are many reasons that the doctor may resort to implanting the joint for the patient, such as obesity, osteoarthritis and old age. As we have looked at this study for the most common reasons found in Tobruk.

Then diagnosed patients and follow them after the operation to observe any complications that may occur after the surgery and also rehabilitate them by physical therapy to recover in the least time to reduce any complication and gone back to normal daily activity.

Whereas information were collected about the cases of the orthopedics department in Medical Tobruk Center, it has been found 25 Total knee Replacements performed between Aug, 2019 to Dec, 2019, as result to workshop that did in that period. It has been found cases with different reason that led to knee replacement such as osteoarthritis. In addition to, the most The patients were at old age over 50 years old. Cases had followed up after operation were 7.

Keywords: Total knee Rreplacement, Tobruk Medical Centre,Libya, 2019.

1. INTRODUCTION

Total joint replacement is a surgical procedure in which parts of an arthritic or damaged joint are removed and replaced with a metal, plastic or ceramic device called a prosthesis. The prosthesis is designed to replicate the movement of a normal, healthy joint.

Hip and knee replacements are the most commonly performed joint replacements, but replacement surgery can be performed on other joints, as well, including the ankle, wrist, shoulder, and elbow [1].

A joint is where the ends of two or more bones meet. There are different types of joints within the body. For example, the knee is considered a "hinge" joint, because of its ability to

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bend and straighten like a hinged door. The hip and shoulder are "ball-and-socket" joints, in which the **round** end of one bone fits into a cup-shaped area of another bone [1].

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. It consists of two bony articulations; the articulation between the femur and tibia bears most of the body weight, while the articulation between the patella and femur creates a frictionless transfer over the knee of the forces generated by contraction of the quadriceps femoris muscle. 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) [2].

The most common causes for Total Knee Replacement TKR

Several conditions can cause joint pain and disability and lead patients to consider joint replacement surgery for example:

- The most common indication for the surgery is osteoarthritis [3;4].

osteoarthritis It's a disease that induces discomfort and stiffness in the joints. It's the most common form of arthritis. Joint pain and stiffness, and problems with joint mobility, are the primary symptoms of osteoarthritis. Some individuals even have signs such as:-swelling-tenderness-grating or crackling sound when the affected joints are moved. Causes of osteoarthritis is unknown, but several risk factor as obesity, old age and common in women than men [5].

- Rheumatoid Arthritis
- Bone Injury: joint dislocations and fractures, especially repeated injuries [6]
- Haemophilia
- Gout
- death of bone in the knee joint following blood supply problems
- Congenital deformity, Malignancy.

The symptoms different according for reasons, some common symptoms are Tenderness or pain, Reduced ability to move, walk, or bear weight, Stiffness in the joint, Swelling in the joint [6], Sometime difficult to walk or with sever pain.

There are several methods for diagnosing by Computed tomography (CT), Magnetic resonance imaging (MRI) and X-ray [7]. A CT scan may identify occult arthritis in the joints, which may bias treatment towards replacement or multiple joint fusions. On X-ray pictures, cartilage does not show up, but a narrowing of the gap between the bones in the joint shows cartilage loss. Bone spurs around a joint can also be seen in an X-ray

MRI is helpful in ruling out stress fractures, soft tissue infections, and tumors, which could drastically alter whether or not the treating physician proceeds with surgery and Laboratory studies such as erythrocyte sedimentation rate, C-reactive protein, and white blood cell count may also be used to help detect an occult infection [8]

the knee joint replacement surgery is the ideal solution for those who have knee problems, especially the elderly and many patients who performed the knee replacemet were satisfied with the result [9] and relieves pain and improves knee function in people with advanced arthritis of the joint [3;4;10]

Physiotherapy play imprtant role pre-operative and post-operative where provides care including medications supply, assessment of pain relief, recovery muscles, rehabilitation, and advices about managing problems. Services include exercise therapy, electrotherapy, hot therapy, ice therapy and others [11]. In addition to usual ward physiotherapy on the recovery of strength, function, and gait speed after total hip or knee replacement surgery [8;12].

Naylor, J., et al (2006) Study about the Status of physiotherapy rehabilitation after total knee replacement in Australia where noted improvement function [13].

Also Understanding of anatomy and knee biomechanics is important for the gait analysis, the diagnosis of joint diseases and the design and development of prosthetic implants. The various choices imply that each specific problem has a corresponding implant [14].

MATERIAL AND METHOD

Medicare Provider Analysis and Review files were used to identify all cases for Total knee replacement in Tobruk medical centre in Tobruk, Libya according to the workshope was held from Aug 2019, through Dec 2019 in Orthpedic department, Tobruk Medical Center, where 25 total knee replacement were performed, but only 7 cases were followed up with the hospital as shown in Table 1.

Table1. The patients had joint replacement.

| Patient | Age | Sex | Causes | Date of OT | Date of exit | |
|---------|-----|--------|--------------------------------|------------|--------------|------------|
| P1 | 65 | Male | Osteoarthritis & old age | 30/8/2019 | 10/9/2019 | |
| P2 | 50 | Male | | | | |
| P3 | 75 | Male | | | 5/12/2019 | 15\12\2019 |
| P4 | 66 | Female | | | | |
| P5 | 62 | Female | | | | |
| P6 | 56 | Female | | | | |
| P7 | 58 | Female | | | 6\12\2019 | |

P: patient number.

As shown in table the most common reason for Total Knee replacement in tobruk medical centre were osteoarthritis and old age whereas all the patients more than 50 years

The Operation :The surgeon begins the operation by making an incision through the skin on the front of the knee. Once through the skin, the nerves and blood vessels are protected and moved to the side as shown in Figure 1.

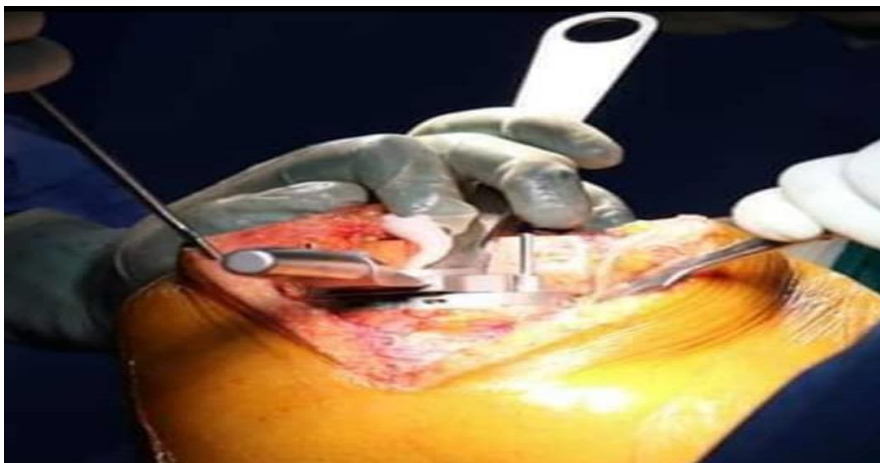


Figure 1. Making an incision on the front of the knee.

The tendons are also moved to the side. An incision is then made into the joint capsule that encloses the knee joint as shown Figure 2.



Figure 2. Moved to the side around the joint.

After that removed the damaged parts of the joint in the femur and tibia bone, on which the alternative joint will be fixed as shown in Figure 3.



Figure 3. Removed damaged parts.

Then prepare the artificial joint to replace it as in photo 4 and fix it in place in the knee, where it is fixed to the bone by cement as in Figure 5.



Figure 4. The artificial joint.



Figure 5. The Cement.

Finally after installing the joint and making sure of its location and the absence of any problems or defects in the process of switching in the joint, the wound is closed.

post-operative : After the operation, the patient should rest for at least one week, make no effort, not carry heavy things, and not move without an assistant or physical therapist.

1. **Medication** :Many of analgesics, antibiotic and nutrients were prescribed bt the doctor as follows:

- Vancomycine 1000 I.V (intravenous) 1x2
- Claforan 1g I.V (intravenous) 1x3
- Clexan 0.4g I,V (intravenous) 1x1
- Voltaren or ketolac 30mg I.M (intramuscular)
- Omprazol 40mg I.V (intra venus) 1x2
- Paracetamol 1g I.V (intra venus) 1x2 when it is needed
- Normal saline ,if the patient does not have hypertension.

The antibiotics are used to prevent infection and inflammation in the places where the surgical procedures are performed on the types of bacteria that enter the body through the incisions made by the surgeon with a scalpel in it during the operation, as some patients became infected but it was controlled. Analgesics for pain relieve.

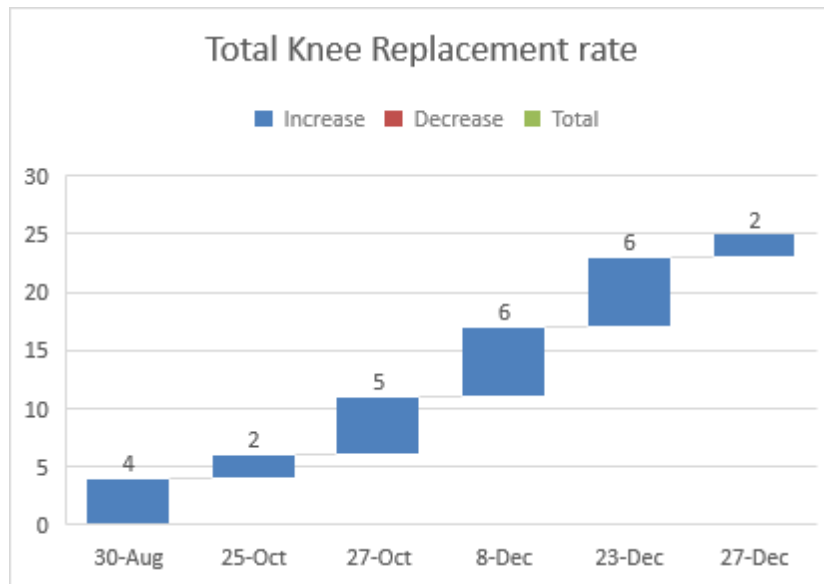
2. Physical therapy: The physical therapy very important after surgery, so the physiotherapist must follow with patient before the operation to prepare him for the post-operative. According to the physical therapy program at the Tobruk Medical Center and was as follow:

- The patient starts standing and walking by walker from the first day of the operation
- Start the CPM "continues passive movement" and passive exercise by physiotherapist
- Flexion knee joint to 90 degree.
- Quadriceps exercise.

RESULTS

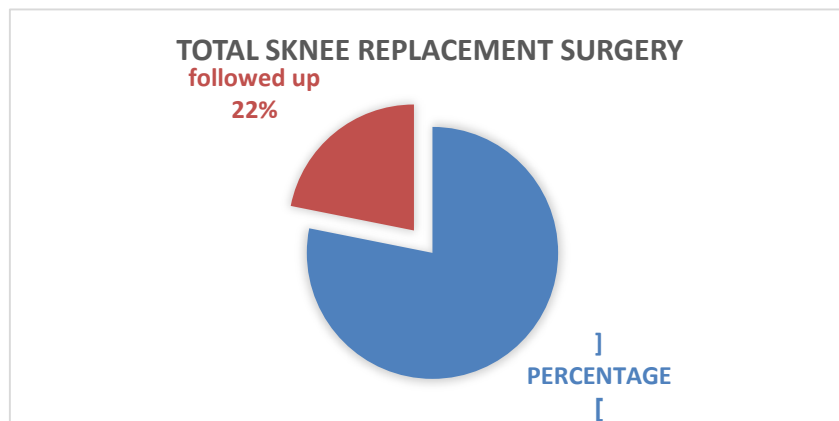
This study on knee joint replacement in Tobruk Medical Center, Libya, where a workshop was held for treatment inside Libya and Tobruk special between Aug 2019 to Dec 2019. The operation was the first of its kind in Orthopedic department, Tobruk Medical Center.

25 total knee replacement were performed, but only 7 cases were followed up with the hospital due to the fact that some patients are living in villages so far from Tobruk or they are from other cities as in Graphic 1 and 2.



Graphic 1. Operations rate of knee joint replacement daily.

As we noted in the graph, the number of operations varied per day, the lowest operations were on 25 Oct and 27 Dec were 2 operations. And highest rate were on 8 Dec and 23 Dec were 6 operations.



Graphic 2. Total knee replacement surgery

This diagram explain the total of operation that performed and the patients followed up the hospital after them sugery .

All operations performed to replace the knee were successful except for only one case that had acute inflammation as complications after the operation as a result of a mistake by the patient in using the replacement joint, which led to get new joint out from its position its location, but was treated and solved the problem through the patient's medical staff.

Physiotherapy at Tobruk Medical Center played an important role for patients to recover and return to normal life in the least time, physiotherapists followed patients before the operation until full recovery by providing them with advice and following up on the rehabilitation program after the operation.

Patients were satisfied with the replace joint and confirmed that they are more comfortable after the operation, it is a big difference and that in the past they suffered a lot from knee pain and the inability to walk.

DISCUSSION

This study conducted to investigate about the causes that lead to total knee joint replacement operation, It was noted that the most common causes for TKR are osteoarthritis and old age, especially the operation that is performed in Medical Tobruk Center, where a workshop was held for treatment inside Libya and Tobruk special between Aug 2019 to Dec 2019. The operation was the first of its kind in Orthpedic department, Tobruk Medical Center and All operations performed to replace the knee were successful.

According to carr, Andrew J., et al (2012) and Skou, Søren T., et al (2010) the most common causes is osteoarthritis [3;4]. That agree with our study wheares were all the patient with osteoarthritis.

NHS. (2019) review conducted with risk factor osteoarthritis are old age, obesity and women[5]. This is consistent with our study whereas all patients more than 50 and most of them are women.

Hawker, G., et al (1998) their studies was a cross-sectional, community-based survey of a random sample of 1750 of 242,311 Medicare recipients was performed, where patients in the national sample were satisfied with the result of the knee replacement, patients persistent relief of pain and improved physical function [8]. This is consistent with our study.

Rahmann, A. E., et al (2009) To evaluate the effect of inpatient aquatic physiotherapy in addition to usual ward physiotherapy on the recovery of strength, function, and gait speed after total hip or knee replacement surgery, where A specific inpatient aquatic physiotherapy program has a positive effect on early recovery of hip strength after joint replacement surgery [11]. There are one difference in this study we did not use hydrotherapy in physicaltherapy program

Physiotherapy plays important role in pre-operative to prepare a patient and learn him about full programme before and after surgery. This agreement with previous report by use orthosis and braces pre operative [7].

Naylor, J., et al (2006) Study about the Status of physiotherapy rehabilitation after total knee replacement in Australia where (Naylor, J., et al 2006). A response rate of 65% (65/100) was obtained [12]. Somewhat consistent with our studies.

Carr, A. J., et al(2012) conduct studies about activity knee replacement and its role relieve pain and improves knee function in people with advanced arthritis of the joint. According what reported in them study the Knee-replacement surgery is frequently done and highly successful and It relieves pain and improves knee function in people with advanced arthritis of the joint. The most common indication for the procedure is osteoarthritis [3]. That what agree with our study.

Skou, S. T., et al (2015) randomized, controlled trial, we enrolled 100 patients with moderate-to-severe knee osteoarthritis who were eligible for unilateral total knee replacement. Patients were randomly assigned to undergo total knee replacement followed by 12 weeks of nonsurgical treatment (total-knee-replacement group) or to receive only the 12 weeks of nonsurgical treatment (nonsurgical-treatment group) they had reported the treatment with total knee replacement followed by nonsurgical treatment resulted in greater pain relief and functional improvement after 12 months than did nonsurgical treatment alone [4]. This agree with our study.

Wylde, V., et al (2016) Thier research aims to benefit patients and the NHS by providing evidence on the long-term effectiveness and cost-effectiveness of outpatient physiotherapy after knee replacement. If the intervention is found to be effective and cost-effective, implementation into clinical practice could lead to improvement in patients' outcomes and improved health care resource efficiency [9]. This is consistent with our research in terms of outcome and purpose.

Conclusion

We conclude from our study on knee joint replacement at Tobruk Medical Center and although it is considered the first of its kind, but it were successful operations for elderly patients suffered from knee pain due to osteoporosis, but after the operation they felt a great improvement. As one patient mentioned, he felt much better than before.

Physiotherapy at Tobruk Medical Center played an important role in recovering patients in a short time and returning to daily activities.

Through this study, we recommend maintaining proper nutrition, exercising and avoiding all wrong practices that may lead to osteoporosis, arthritis, and others.

We also emphasize the need for new strategies to treat early-stage osteoarthritis, which will ultimately reduce the demand for joint-replacement surgery and further studies are required to confirm these findings.

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المستخلص: هذه الدراسة تُحقق في الأسباب التي تؤدي الي زراعة مفصل الركبة وخاصةً العمليات التي تم اجرائها في مركز طبرق الطبي حيث هناك كثير من الأسباب التي تُسبب مشاكل في منطقه مفصل الركبة الذي يعتبر من اكبر مفاصل في جسم الانسان وأكثرها تعقيداً وهناك الكثير من الأسباب التي يلجأ فيها الطبيب الي زراعة المفصل للمريض مثل هشاشة العظام والسمنة والشيخوخة حيث بحثنا في هذه الدراسة عن أكثر الأسباب شيوعاً والتي لُوحتت في طبرق
بالاضاف الى دراسة الأعراض وكيفية تم فحص المريض أما بطريقة الفحص السريري او أشعه السينية و الاشعة المقطعية والرنين المغنطيسي، ثم متابعة المرضى بعد العملية وملاحظه المضاعفات التي حدثت بعد العملية وإعادة تأهيلهم بالعلاج الطبيعي والتعافي في اقل وقت والعودة لنشاطهم اليومي.
حيث جُمعت المعلومات من قسم العظام في مركز طبرق الطبي، ووجد حوالي 25 حالة تم زراعة مفصل ركبته لها خلال ورشة العمل للعلاج بالداخل التي اجريت خلال 8.2019 الي 12.2019 وكانت اسباب الزراعة مختلفة منها التهاب المفصل. بالاضافة الي العمر وكانو اكبر من 50 سنة ، واجمالي الحالات التي استمرت في المتابعه بعد العمليه 7 حالات.
كلمات البحث: زراعة مفصل الركبة،العلاج الطبيعي، اعاده التاهيل، مركز طبرق الطبي، ليبيا، 2019.

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