

KINETIC RECOVERY OF THE PATIENT WITH GONARTHROSIS

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Abstract: *Osteoarthritis of the knee, also known as gonarthrosis, is indeed a common and growing concern, particularly as factors like increased life expectancy and rising obesity rates contribute to its prevalence. A few key points to highlight from the statistics you've provided: About 13% of women and 10% of men over the age of 60 are diagnosed with gonarthrosis; The prevalence significantly rises in people over the age of 70, where it affects 40% of this population. This reflects the impact of aging on joint degeneration; Gonarthrosis is more common in women than men. While exact reasons aren't fully clear, hormonal factors, differences in joint anatomy, and possibly physical activity differences may play a role in this disparity; Despite radiographic evidence of osteoarthritis, only a portion of individuals' experience symptoms. This emphasizes that structural joint changes don't always equate to pain or functional limitations; One study suggests that only 15% of patients with radiographic evidence of gonarthrosis have symptoms, indicating that many individuals may have osteoarthritis without knowing it; The overall incidence of symptomatic gonarthrosis is about 240 cases per 100,000 people per year, making it a significant public health issue. [4]*

Key words: *Gonarthrosis, kinetic exercises, recovery program, old patient.*

1. Introduction

Osteoarthritis of the knee, also referred to as degenerative joint disease (DJD), results primarily from the wear and tear of the joint and the progressive loss of cartilage. Cartilage is the smooth tissue that cushions the ends of bones in the joint, and as it breaks down, the bones begin to rub against each other, causing pain, swelling, and decreased movement. Over time, the joint may lose its normal

shape, and bone spurs, or extra bits of bone, may form around the joint.

The ends of the bones that make up the knee joint are covered with cartilage. It allows the two bones to slide past each other and is made up of a "gel" of large molecules, which have the particularity of absorbing a lot of water (they act like sponges). [12]

In osteoarthritis, cartilage lesions do not regress, and their progression is not linear. The evolution can be very fast and make it

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necessary to fit a prosthesis in less than 5 years, or in other cases, the disease can progress slowly, over several years, without inducing any major handicap. [15]

2. Simptomatology

Your statement accurately reflects how clinical symptoms can change over time, often worsening in severity, frequency, and impact on daily life. This variability in symptoms can be influenced by numerous factors.

- Mechanical pain (during movement);
- Rigidity;
- Crackling;
- Blockage in the joint;
- Edema in the joint;
- Difficulty walking, climbing and/or going down the stairs. [10]

3. Risk factors

Editable:

- Joint trauma;
- Occupation- standing a lot or bending the knees repeatedly at work;
- Muscle imbalance;
- Weight;
- Health-metabolic syndrome.

Non-modifiable:

- Gender;
- Age;
- Heredity. [5]

Several studies have explored the relationship between lifestyle factors—such as nutrition, physical activity, risk factors, and locus of control—and their impact on health, including conditions like osteoarthritis. One important finding from these studies is that female subjects tend to have deficiencies in physical activity compared to their male counterparts. [2]

4. Diagnosis

The physical examination of the knee is a crucial step in diagnosing knee conditions, including osteoarthritis. A thorough examination typically begins with visual inspection and progresses to other assessments. Here's a step-by-step guide to what a clinician looks for:

- Visual Inspection (Patient Standing);
- Observation of Gait;
- Inspection of the Skin.

Testing the range of motion of the knee joint is an essential aspect of the clinical examination. Flexion and extension movements are evaluated passively and actively. [3]

The diagnosis of gonarthrosis is often easy to make in front of mechanical pain, especially in a patient over 50 years of age. However, the diagnosis can be more reliably confirmed by a standard X-ray that usually shows signs characteristic of osteoarthritis: pinching of the joints, the existence of osteophytes (excess bone around the joint), condensation of the bone under the cartilage, the appearance of „holes” in the bone, due to the grinding process. [13]

Your doctor may recommend an MRI (Magnetic Resonance Imaging) in certain cases when evaluating knee conditions. An MRI uses a strong magnetic field and radio waves to produce detailed images of bones and soft tissues, including cartilage, ligaments, tendons, and muscles. While an MRI is not commonly used as the first-line diagnostic tool for osteoarthritis, which can usually be identified through a clinical examination and X-rays, it can be valuable in specific or complex cases.

Joint fluid analysis can be used by the doctor by using a needle that draws fluid from the knee, which is then tested for

inflammation and to determine whether the pain is caused by gout or an infection, rather than osteoarthritis. [14]

5. Treatment

Gonarthrosis (knee osteoarthritis) is a chronic degenerative joint disease that cannot be completely cured. The goal of treatment is to manage symptoms, slow disease progression, and improve joint function. Treatment typically begins with conservative approaches and may progress to surgical options if these measures fail. Here's an overview of the treatment strategy. [10]

- Drug treatment: analgesics and anti-inflammatories in order to relieve pain; [16]

- Thermotherapy: both hot and cold compresses can be applied to the knee; heat helps relax muscles and relieve pain, while ice helps reduce inflammation, relieve pain and prevent/reduce muscle spasms; [14]

- Spa treatment: at the doctor's prescription, a spa treatment (water with mineral salts, steam, mud) can be followed for a period of 3 weeks, 2-3 times a year;

- Massage: has a main role right from the beginning of the recovery program, thanks to the favorable effect on the stimulation of proprioception (maintenance of muscle tone) and by mobilizing the patella on the femoral condyles; in addition, massage has a circulatory and biotrophic effect on local tissue;

- Physical therapy and physical exercise: if the patient has difficulties in performing everyday tasks, physical therapy can be of great help. In the absence of a conservative treatment capable of

promoting the regeneration of cartilage affected by osteoarthritis, physical-kinetic treatment remains the most rational therapeutic solution because physical medicine has the necessary means to combat pain, chronic inflammation and can prevent disabling deformities. Therapists can work with the patient on how to increase the mobility of the knee joint and tone the muscles through exercise, and then teach them how to stretch the adjacent muscles to reduce pain. Also, the patient can exercise regular activities on their own, such as swimming, walking, cycling, which can be equally effective; [6]

- Occupational therapy: Occupational therapy helps the patient discover ways to do everyday tasks without putting stress on the painful joint;

- Physiotherapy: perfectly complements physical therapy, making it possible to prevent the exacerbation of the disease in the chronic stage, especially pain reduction;

- Laser therapy: this therapy has a beneficial effect on restoring damaged tissues in the knee joint, as well as reducing pain;

- Magnetotherapy: improves vascular tone and accelerates the recovery process of the damage joint;

- Tens: it uses a low-frequency electric current to relieve pain; provides short-term relief for people suffering from osteoarthritis; [17]

- Surgical treatment: it is used in only 10% of cases, especially in the case of gonarthrosis and coxarthrosis, when the patient becomes very affected, when walking is no longer possible in daily life, and/or when the pain is too great; most often the surgeon will suggest

arthroscopy, osteotomy or knee prosthesis; [11]

- Arthroscopy: the surgery is performed through small incisions, where the surgeon inserts the arthroscope and observes the joint space. Once at the point, the surgeon can remove damage cartilage or loose particles found in the joint, clean the bone surface, and repair other types of tissue if they exist. The procedure is performed on people younger than 55 years of age, in order to delay a more serious surgical intervention;

- Osteotomy: is a procedure that aims to improve knee alignment by changing the shape of the bones. This type of intervention is recommended if there are injuries in an area of the knee, as well as following a fracture that has not healed properly;

- Knee prosthesis: it is the intervention by which the knee joint is replaced, totally or partially, with artificial metal or plastic parts. It is also possible that the procedure will be repeated later if the joint wears out over time, but with today's modern advances, most new joints will last up to 20 years. The surgery has risks, but the results are generally very good. [17]

5.1. Postoperative recovery

Postoperative care and recovery following a total knee replacement (total prosthesis) are crucial for restoring the highest possible range of joint mobility and muscle control in the operated knee. The specific recovery program can vary among surgeons and rehabilitation teams, but certain core principles are generally followed.

It is also allowed to leave the weight completely on the operated lower limb,

together with a frame and under the supervision of a therapist.

Active knee extension movements and exercises designed to tone the muscles begin from the first postoperative day, while gait and transfer training continue. In general, the patient must learn to move safely with an assistive device for walking on flat ground and stairs, the ability to safely transfer from bed to sitting, from bed to standing, as well as to control pain before being discharged from the hospital.

After a total knee replacement surgery, the typical length of hospital stay is about 1 to 2 nights, though it can vary depending on the patient's overall health, recovery progress, and the hospital's protocols. Some patients may even be eligible for same-day discharge in certain cases, particularly if their recovery is smooth and they are mobile with assistance.

The patient begins to be independent in the activities of daily life and focuses on exercises that favor the increase of the range of motion and the muscles adjacent to the knee.

After a total knee replacement, the patient's ability to resume daily activities, such as driving and working, depends on their individual recovery progress, strength, and mobility.

- Resuming Driving:

Patients can generally start driving when they are able to operate the pedals safely and quickly, and this typically takes around 4 to 8 weeks after surgery.

- Returning to Work:

The timeline for returning to work depends on the nature of the patient's job and the physical demands required:

- Routine Check-ups:

After the first two-week postoperative visit, routine follow-ups are typically scheduled at the following intervals:

These visits are used to monitor the knee's healing progress, assess mobility and strength, and ensure the prosthesis is functioning as expected.

- Resuming Physical Activities:

Once strength, mobility, and balance are regained, usually after a few months of rehabilitation, the patient can resume low-impact physical activities. [3]

5.2. Recovery objectives

Recovery objectives are:

- Combating pain and inflammation;
- Increased joint mobility;
- Increased muscle strength;
- Restoring muscle balance;
- Increasing knee stability;
- Re-education of walking;
- Maintaining myoarthrokinetic function in adjacent joints.

5.3. Postoperative treatment

Postoperative treatment at this stage includes:

- Physiotherapy;
- Massage;
- Kinesiotaping;
- Deep Oscillation;
- Compex.

5.4. Indication

- Resuming walking is done immediately;
- Sleep involves a position with the pelvic limb operated on a pillow;
- Food is normal, but in the case of an overweight person, weight loss is essential;
- We recommend taking iron supplements and vitamins;
- Swimming is recommended;

- Avoid activities that put great pressure on the joint. [3]

5.5. Contraindication

- Do not cross your legs at knee level;
- Do not raise the knee above the hip;
- Do not lean forward while sitting down or sitting down;
- Do not try to take anything from the floor while sitting;
- Do not force the legs to turn inward or outward when you bend over;
- Don't sit with your toes turned inside out. [8]

5.6. Possible causes of secondary gonarthrosis

- Post-traumatic;
- Post-surgical;
- Congenital;
- Incorrect position of the limb;
- Scoliosis;
- Wilson's disease;
- Gout;
- Rheumatoid arthritis. [9]

6. Results and Discussions

The muscle balance and the joint balance of the knee were carried out through the prism of the initial, intermediate and final tests.

The testing was carried out with the help of the goniometer, respectively the isokinetic muscle strength measuring device.

A significant increase in the values of joint mobility of the knee can be observed, during the flexion movement. Gradually, from phase to phase, the patient recorded favorable values, the range of motion increasing by at least 30

degrees from one stage to another.

At the level of the extension, it was kept until the end of the medical recovery sessions, without the need to apply a special treatment in order to restore this movement.

Psychologists consider self-esteem as being a human value that can be higher or

lower, depending on the life experiences. [1]

Sports helps to recover faster from medical problems. It can be concluded that dynamic games had a positive influence, helping the subjects learn running and more. [4]

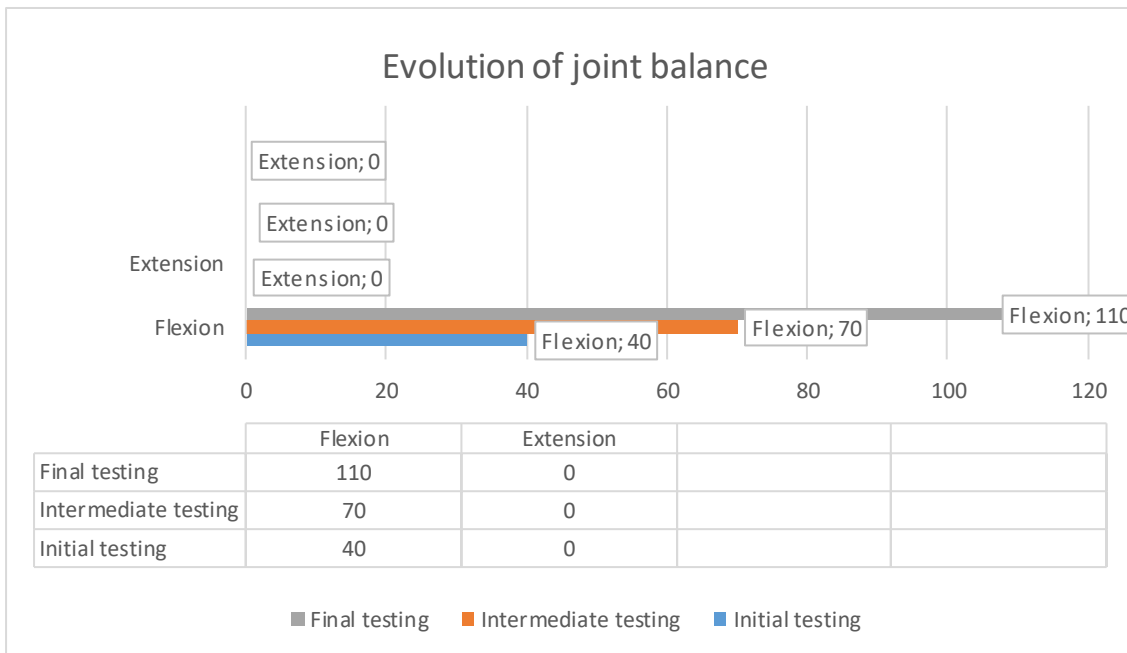


Fig. 1. Evolution of joint balance

Evolution of joint balance

Table 1

Movement	Initial test	Intermediate test	Final test
Flexion	40 °	70 °	110 °
Extension	0 °	0 °	0 °

As can be seen in figure 1 and table 1, the patient's evolution is visible, following the 3 tests. At the initial test, the patient recorded a value of 40 degrees on the flexion movement, and after about 3 weeks this value will increase considerably, reaching 70 degrees. The final testing took place at the end of the medical recovery, where the patient recorded a value of 110

degrees, 40 degrees more than the previous testing and 70 degrees more than the initial testing. The orthopedic doctor's recommendation was not to force more than this range of motion due to the patient's bone quality. The extension movement was kept within normal limits from the beginning of recovery until its end.

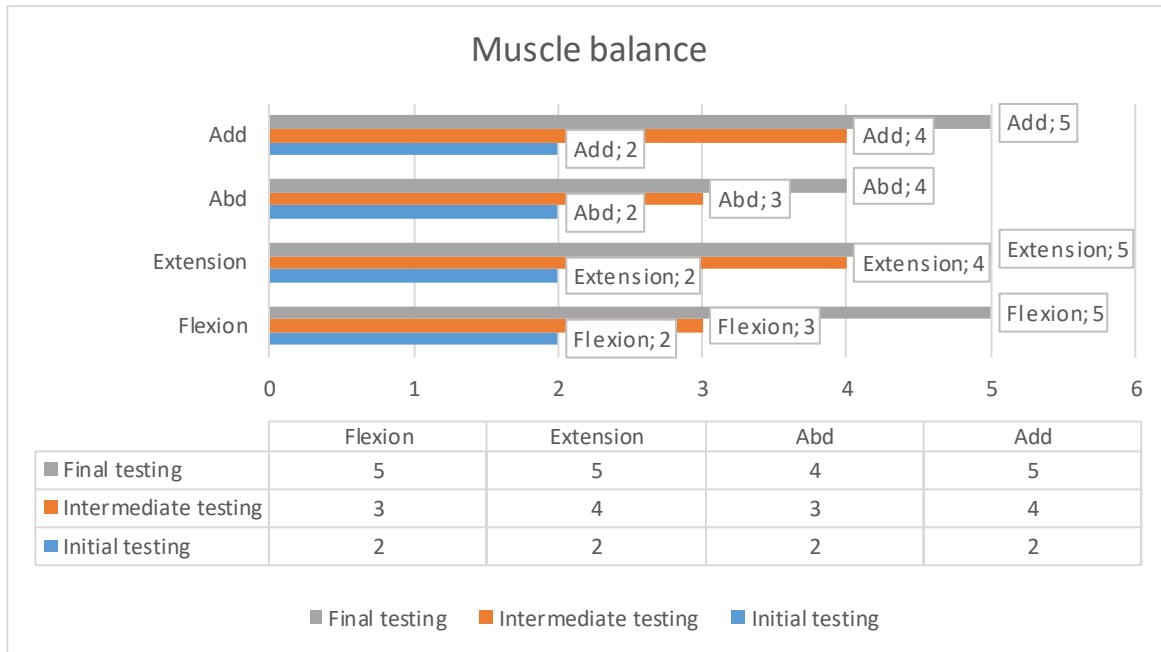


Fig. 2. Muscle balance

Muscle balance

Table 2

Muscles	Initial test	Intermediate test	Final test
Flexion	F2	F3	F5
Extension	F3	F4	F5
Abd	F2	F3	F4
Add	F2	F4	F5

As can be seen in figure 2 and table 2, the patient's evolution is visible, after performing the 3 tests. At the initial test, the patient recorded an F2 value at the level of the flexor muscles, and after approximately 3 weeks this value will increase considerably, reaching F3. The final testing took place at the end of the medical recovery, where the patient recorded an F5 value.

At the level of the extensor muscles, the initial test was F3, followed by an increase

to F4, later the maximum value of F5 was recorded in the final test.

The abductor musculature was the only one left on the deficit. This cannot record the maximum values of F5. At the initial test, the value of F2 was recorded, at the intermediate test F3 and at the end F4.

The adductor musculature recorded at the level of the initial F2 test, then at the intermediate F4 test, and at the end it recorded the maximum force F5.

7. Conclusions

Early physiotherapeutic treatment plays a crucial role in the successful recovery of patients after knee replacement surgery. When initiated early in the recovery process, this treatment helps improve joint function, reduce pain, and prevent complications. Here's a breakdown of the key components of physiotherapy after knee surgery:

- **Early Physiotherapy:**

Starting physical therapy early is beneficial for promoting faster recovery and restoring mobility. This includes:

1. Dynamic and static exercises;
2. Dynamic exercises involve controlled movements to enhance range of motion and flexibility of the knee joint;
3. Static exercises are isometric movements where the muscles are engaged without joint movement, such as quadriceps sets or gluteal contractions, helping to rebuild strength and stability around the knee.

- **Physical Exercise as the Core of Rehabilitation:**

1. Physical exercise is the foundation of physiotherapy, and it is applied systematically to improve joint mobility, muscle strength, and overall functional capacity;
2. Dynamic exercises may include controlled knee bends and extensions, leg lifts, and eventually cycling or swimming;
3. Static exercises help with muscle strengthening without straining the joint, such as isometric leg presses or thigh muscle contractions.

- **Knee Hygiene Program:**

1. As part of the rehabilitation plan, the patient is instructed in knee hygiene rules, which are daily practices designed to protect and care for the knee joint;
2. Daytime and nighttime activities are addressed to prevent improper movements or positions that could strain the knee or affect recovery;
3. This may include advice on how to sit, stand, sleep, and move without placing undue stress on the healing knee.

- **Posture Awareness in the Kinetoprophyllaxis Program:**

1. Kinetoprophyllaxis refers to the preventive aspect of physical therapy, where patients learn to adopt correct postures and movement habits to prevent further joint damage or strain;
2. Posture awareness exercises teach patients to maintain proper alignment during daily activities such as walking, standing, or sitting, reducing the risk of developing compensatory movements that can lead to pain or discomfort;
3. The corrective positions learned during therapy sessions are designed to be integrated into everyday life, ensuring that the patient maintains optimal joint health as they heal.

- **Continuation of Movement Therapy:**

1. Movement therapy is a long-term strategy to consolidate and maintain the results achieved during early rehabilitation;
2. Patients are encouraged to continue performing exercises aimed at maintaining flexibility, strength, and mobility.

3. This may also involve incorporating low-impact activities like walking, swimming, or cycling into their daily routine to promote sustained joint health and prevent further deterioration.

Modern medicine is not limited only to the outcome of medical treatment, but on the contrary tries as far as possible to give the patient the functional capacity for an active life. [7]

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