

## Systematic Examination of Patients with Lower Limb Plastic Surgery (femur fracture) and Vascular Embolism Based on Ultrasound, Radiology and ICU Points

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### Abstract

This study systematically investigated patients with lower limb plastic surgery (femur fracture) and vascular embolism based on ultrasound, radiology and ICU points. Bone fracture after hip replacement surgery is one of the complications after surgery that rarely happens. This condition is mainly common in elderly people who have reduced bone thickness or have special medical conditions. When a person needs physiotherapy after femur surgery, when the femur is fractured. Femur fracture is an injury, crack or fracture caused by contact in the femur. If a fracture occurs in the upper part of the femur or adjacent to the hip joint, sometimes this fracture is also called hip fracture or hip fracture. One of the most important symptoms of a femur fracture is severe and excruciating pain in the thigh, which increases with pressure on the fracture site or movement. Inability to move the lower limb, deformation of the lower limb in the form of shortening and outward rotation, and thigh swelling are symptoms of this bone fracture. All hip fractures are treated with surgery. In such a way that they first fix the fracture, then through small slits in the skin. The intraosseous rod or plate is attached to the bone and fixes it. In this way, it is called closed reduction and internal or external fixation. When the closed reduction is not done, the surgeon uses the open reduction method and fixes and immobilizes the fracture with the methods of using rods. Other treatments include physiotherapy, water therapy, exercise therapy.

**Key words:** Lower limb plastic surgery, Femur fracture, vascular embolism, ultrasound, radiology, ICU.

### Introduction

Your thigh bone (femur) is the longest and strongest bone in your body. Because the femur is very strong, it usually takes a lot of force to break it. This bone is one of the longest and strongest bones in the body [1-3]. Considering the accident, accompanying symptoms and the position of the pelvis and leg, the doctor can suspect a fracture of the femoral neck. Radiology is the first step to investigate and investigate the direction of the fracture. In the radiography of the femur, it should be taken in such a way that the orthopedist can see the hip joint, the head of the femur, and the neck of the femur exactly [4].

This important organ in the body consists of three main parts, which are:

1- Proximal or the upper part of the femur: which is derived from

The head of the femur is the greater trochanter and the lesser trochanter, which participates in the formation of the femur joint, the head of the femur [5].

2- The shaft or the middle part of the femur: which is tubular as well as cylindrical. On the back side of this part of the femur, from its upper to its lower part, there is a longitudinal ridge called Linea aspera [6].

3- The lower or distal part of the femur: in the shape of the two inner and outer hemispheres of the femoral condyles, and it helps in creating the knee joint [7].

There are many muscles around the femur, and many nerves and blood vessels pass through these muscles. As we explained in the above section, the muscles of the femur region are located in three sections, in such a way that each of these sections is separated from the other sections through a tissue curtain called the septum. It is

better to know that each category is also called a compartment, each of which has its own nerves and vessels (Figure 1). The thigh muscles are composed of three parts: front (anterior), back (posterior), internal (medial) compartment [8].



Figure 1. The lower or distal part of the femur

#### Search strategy and selection of articles

Search in Scopus, Google scholar, PubMed databases and by searching with keywords such as "Nursing Services", "Medical Services", "Maxillofacial Abnormalities and Surgical Stability", "Facial Asymmetry and Periodontal Problems" and "Changing the Angle of the Proximal Segment in Patients" to obtain articles related to the selected keywords [10-12]. Case report articles, editorials,

and articles that were not published or only an introduction of them were available, as well as summaries of congresses and meetings that were in languages other than English, were ignored. Only the original research articles that evaluated the effectiveness of different drugs in the treatment of COVID-19 using standard methods were studied (figure 2) [13].

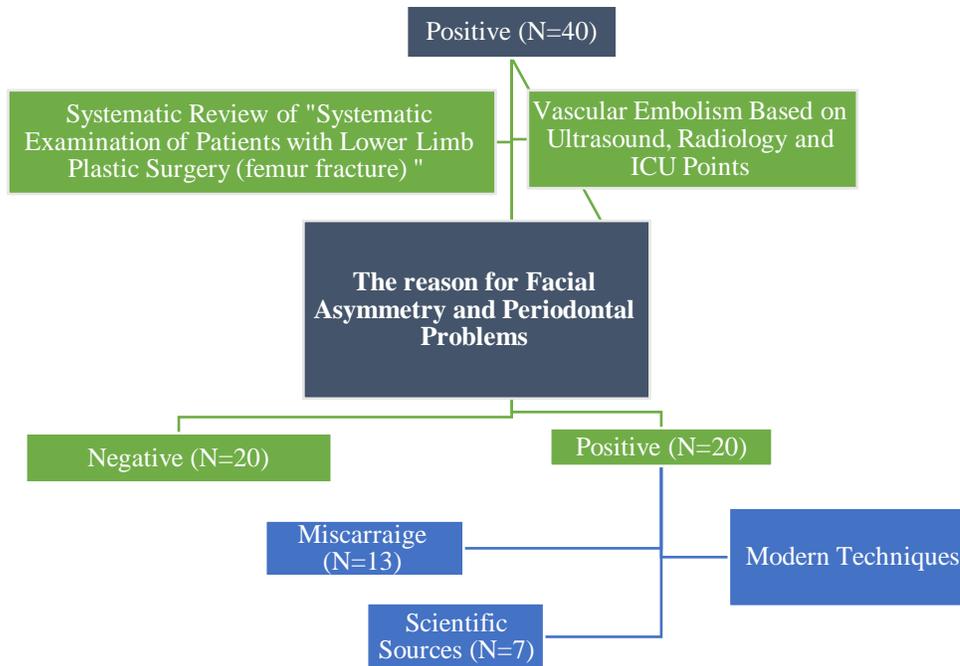


Figure 2. Flow chart of included subjects

### Front thigh muscles

The muscles of the front of the thigh have the largest mass of thigh muscles in this part, and the main and important quadriceps and sartorius muscles are formed in these two parts [9]. Quadriceps are also called quadriceps, which are also known as the largest thigh muscles. Quadri consists of four other muscles: vastus medialis, rectus femoris, vastus intermedius, vastus lateralis. Quadriceps muscles are one of the strongest muscles in the body, all four of which straighten the knee joint or extensor [10-12]. It is worth mentioning that the muscles of this part of the vastus medialis play a significant role in keeping the patella bone stable in the anterior part. The long and straight part of the femur is called the femur trunk. When a fracture occurs along this part of the bone, it is called a femoral shaft fracture. This type of leg fracture almost always requires surgery. The trunk of the femur starts from under the hip (pelvis) and continues until the part that begins to widen to form the knee [13-15].

### Causes of fracture after hip replacement

This form of fracture occurs after hip replacement due to falls, accidents, and severe blows to the hip joint and prosthesis. Factors such as weak bones due to osteoporosis or lack of balance when walking increase the possibility of falling and breaking bones. Femur fractures in young people mostly occur due to high-energy trauma [16]. The most common cause of femur fracture is a motor vehicle or motorcycle accident. A car accident while walking is

another common cause, as are falls and gunshot wounds. Low-force events, such as falling to the ground from a standing position, may cause femoral shaft fractures in older people with weaker bones [17-19].

### Types of fractures of the femur or femur

Femur fractures are very different depending on the type of force that caused the fracture. Bone fragments may remain correctly positioned, or may be misaligned. The skin around the fracture may be healthy, or the bone may have pierced the skin. Doctors describe fractures to each other using classifications.

#### 1- Femur fracture classification depends on the following.

- ✓ The fracture site of the femur trunk is divided into three parts:
  - ✓ away from the center of the body (distal) [20].
  - ✓ Middle.
  - ✓ Close to the center of the body (proximal).
- 2- The pattern of breaking, for example, a bone, can be in different directions such as transverse, longitudinal or oblique.
- 3- Are the skin and muscles around the bone torn by the injury, or not?

#### The most common types of femur fractures include the following:

- 1- Transverse fracture: In this type of fracture, the fracture is a horizontal straight line that passes through the femur trunk [21].
- 2- Oblique fracture: this type of fracture has an angle along the trunk.
- 3- Spiral fracture: the fracture line surrounds the body of the bone like stripes around candy bars. A twisting force on the thigh causes this type of fracture [22].
- 4- Fracture with crushing: In this type of fracture, the bone is broken into several pieces. In most cases, the number of fragments is related to the amount of force required to break the bone.
- 5- Open fracture: If the bone breaks in such a way that the broken piece passes through the skin, or the wound reaches the bone, that fracture is called an open or compound fracture. An open fracture is usually associated with more damage to surrounding muscles, tendons, and ligaments, which carries a higher risk of complications and requires more time to heal.
- 6- Left side: an oblique fracture has an angle along the trunk [23-25].
- 7- Right side: In a fracture with crushing, the bone is broken into several pieces.

### Symptoms of a femur fracture

Femoral shaft fracture usually causes a sudden and severe pain. You will not be able to put weight on the injured leg and the injured leg may look deformed [26].

### Imaging

Imaging tests will give your doctor more information about the damage.

1- Radiology photo: The most common method for fracture evaluation is radiology photo, which provides a clear image of the bone. A radiograph can show whether the bone is healthy or broken. It also shows the type of

fracture and the location of the fracture. The radiograph shows a transverse fracture of the femur. It is a horizontal and straight fracture along the length of the trunk [27-29].

2- CT scan: If your doctor still needs more information after seeing the radiology photo, he may order a CT scan. A CT scan shows a cross-sectional view of your leg. This photo gives your doctor useful information about the severity of the fracture. For example, sometimes the fracture line may be very thin and difficult to see in the radiograph. CT scan helps to see these lines with better clarity [30].

### Complications of femur fracture

Fracture of the femur can cause complications and injuries.

- ✓ The end of a broken bone is usually sharp and can tear blood vessels and nerves, although this is rare.
- ✓ Acute compartment syndrome may occur. It is a painful condition that occurs when the pressure inside the muscle reaches a dangerous level. This pressure can reduce blood flow, which prevents nutrients and oxygen from reaching nerve and muscle cells. This is an emergency surgery. During this procedure, your surgeon will make an incision in the skin and overlying muscles to relieve pressure [31-33].
- ✓ Open fractures expose the bone to the open environment. Even with good surgical cleaning of the bone and muscle, the bone can become infected. Treatment of bone infection is difficult and usually requires multiple surgeries and long-term antibiotics.
- ✓ In some cases, the ligaments around the knee can be damaged during a femur fracture. If you have pain after knee surgery (Figure 3) [34].



Figure 3. Complications of femur fracture

## Femur fracture treatment

A) Non-surgical treatment: Most femur fractures require surgery for treatment. Nonoperative treatment for femoral fractures is uncommon. Femur fractures in very young children can sometimes be treated with a cast [35].

### B) Surgical treatment:

1- Surgery time: Most femur fractures are treated within 24 to 48 hours. In some cases, treatment is delayed until another life-threatening problem or other unstable medical condition is stable. To reduce the risk of infection, open fractures are treated with antibiotics as soon as the person arrives at the hospital. Open wound, tissue and bone should be cleaned during surgery. For the time between initial emergency care and the time of surgery, your doctor may put your leg in a stretch or in a splint. This aligns your broken bones as much as possible to maintain your leg length. Bone traction is performed using a system of pulleys, weights, and counterweights that hold the broken pieces of bone together. This keeps your leg straight and usually helps reduce pain [36-38].

2- External fixation: In this type of operation, clips or metal screws are placed inside the bone at the top and bottom of the fracture. Clips and screws are attached to a rod on the outside of the skin. This device is a stabilizing skeleton that keeps the bone in place. External fixation is usually a temporary treatment for femoral fractures. Because of its simplicity, external fixation is usually used when the patient has multiple injuries and is not yet ready for a longer surgery to fix the fracture. In some cases, an external fixator remains until the femur is completely healed, although this is not common. External fixation is usually used to temporarily hold bone fragments together when the skin and muscles are damaged [39].

3- Intraosseous rod insertion: Currently, the method that most surgeons use to treat femur fractures is intraosseous rod insertion. During this process, a specially designed metal rod is inserted into the femoral canal. A rod is passed through the fracture to hold it in place. Intraosseous rod placement provides a strong and stable fixation along the entire length of the bone. The intraosseous rod can be inserted into the bony canal through the knee or hip. Screws are placed above and below the fracture to keep the leg in proper alignment until the bone heals. Intraosseous rods are usually made of titanium. These rods come in different lengths and diameters to fit the femur (Figure 4).



Figure 4. Left: Lateral radiograph shows a transverse fracture of the femur, Right: From the front view, this radiograph shows a fracture treated with intraosseous pinning.

4- Plate and screw: During this operation, the bone parts are first placed back in their natural place and alignment. These parts are kept together and to the outer surface of the bone using screws and plates. Plates and screws are usually used when intraosseous rod placement is not

possible, such as fractures that have extended to the knee or hip.

### Recovery process after surgery

Most femur fractures require between 3 and 6 months to fully heal. Some take even longer, especially if the fracture is open or the bone is broken into several pieces, or if the patient smokes.

### Pain control

Pain after an accident or surgery is a normal part of the healing process. Your doctor and nurse will work to reduce pain, which can help you recover faster. Usually, after an accident or surgery, drugs are prescribed for short-term pain relief. Many types of medications are available to control pain. These drugs include acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), gabapentin, muscle relaxants, opiates, and topical pain relievers. Your doctor may use a combination of these medications to reduce pain and also reduce the need for narcotics. Some pain medications may have side effects that affect your ability to drive or do other activities. Your doctor will talk to you about the side effects of the pain medications you are taking. Be aware that although narcotics help reduce pain after an accident or surgery, these drugs can be addictive. Drug addiction and overdose have become a critical health problem in America. It is important to use opioids only with the doctor's prescription. As soon as the pain improves, stop taking the drug. If your pain does not improve within a few days after treatment, talk to your doctor about it.

### Weight bearing

Many doctors encourage you to move your leg early in your recovery. It is important to follow your doctor's instructions to put weight on the affected leg to avoid further problems. In some cases, doctors allow the patient to put as much weight on the injured leg after surgery as possible. However, you may not be able to put your full weight on it until the foot heals. Make sure you follow your doctor's orders carefully. When you start walking, you may need crutches or a walker for support.

### Physiotherapy

Because you are likely to lose muscle strength in the injured area, it is important to exercise during recovery. Physiotherapy will help you regain normal muscle strength, range of motion, and muscle flexibility.

Physiotherapy also helps to control pain after surgery. A physical therapist will likely teach you specific exercises while you are still in the hospital. The therapist will also teach you how to use crutches and walkers [38].

### Physiotherapy after femur surgery

After one to two days of femur surgery, the physiotherapist helps the patient to get up from the bed and to stand up and walk little by little with his help. Because, according to experts, this prevents the patient from getting out of bed and walking from the blood clots and other side injuries that may be caused to the patient. It is better for patients to use special canes and walkers to help them walk after surgery. Physiotherapists should provide diaphragmatic breathing training to their patients after surgery. In order to improve ventilation to the lungs, it is better to perform respiratory physiotherapy for this group of patients.

### Advantages of physiotherapy after femur surgery

Performing physical therapy movements after femoral surgery for the treatment of patients has several advantages, which include:

1- Pain reduction: Physiotherapists may use several types of treatment as well as multiple devices to reduce and control pain in order to accelerate the improvement of patients' condition. This series of treatments includes:

- ✓ Ultrasound
- ✓ Ice.
- ✓ the heat.
- ✓ laser therapy.
- ✓ Therapeutic Exercises.
- ✓ Slow electrical stimulation.
- ✓ Magnet therapy.
- ✓ Other special treatments that require the expertise and skill of a physiotherapist, which are considered part of manual techniques (Figure 5).

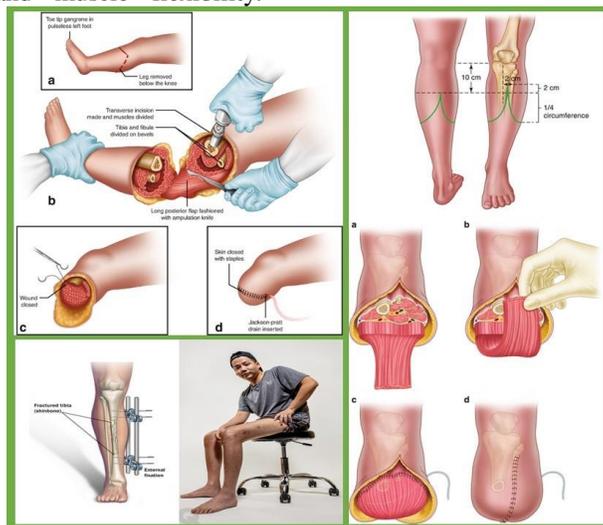


Figure 5. Advantages of physiotherapy after femur surgery

2- Improving movement: Another advantage of physiotherapy after femur surgery can be mentioned is improving the movement of the lower limbs of patients. The physiotherapist chooses special treatments and also several activities, which help to restore the hip joint and the normal movements of the leg. This probably starts with effective movements performed by the physiotherapist on the hip and leg joints for the patients. Therefore, the patient is able to perform these movements on his own and progress in the process of recovery by gradually performing stretching activities and exercises that have received the necessary training [40].

3- Improving strength: Some specific exercise movements are effective in order to improve the condition of the patient's lower limbs in each stage of recovery, and the physiotherapists use a special treatment program for the patients. In order to improve the strength of the thigh organs, the physiotherapist chooses appropriate and special exercises for the patients, which will cause your strength, power, as well as your dexterity and agility to return again, and in this regard, they provide the necessary training to the patient. Exercises that greatly help improve the strength of patients include: stretching bands, free weight machines, using free weights, cardio machines, and weighted pulleys.

#### **Speeding up recovery time**

Another advantage of physiotherapy after femur surgery can be mentioned is speeding up the recovery time in patients. Physiotherapists help to accelerate the improvement of your treatment process by performing appropriate sports movements and treatment steps, so that the patient can return to his normal life faster and earlier than the scheduled time that the patient could help himself in his treatment. Achieve your overall goals.

#### **Speeding up recovery time**

1- Returning to daily activities: Physiotherapists are obliged to design the best treatment plan for their patients according to the individual's will in pursuing recovery goals, which include return to work and exercise, so that in this way the safest, most effective and at the same time, the fastest possible way for the patient to reach his goals. As we have explained in the above, the physiotherapist, in order to help the patients who have undergone femoral thigh surgery, uses manual techniques, exercises, special physiotherapy devices, the seriousness of retraining to perform tasks in the workplace, special exercises and also methods. They use it appropriately and specifically.

2- Preventing future injuries: The physiotherapist provides a home exercise plan to stretch the muscles around the hip joint, strengthen the upper part of the thigh and also the mid-body in order to prevent many problems that may occur in this area in the future, provide the necessary

medical instructions to the patient. These movements consist of strength and flexibility exercises for the quadriceps muscles, adductor muscles, abductor muscles, hamstrings, and mid-body muscles. which may be caused to patients in the future, it prevents. All the mentioned cases are among the advantages of physiotherapy after femur surgery, and all patients undergoing this surgery are required to perform the mentioned sports exercises [38].

#### **Fracture diagnosis after hip replacement**

In order to diagnose a fracture, the doctor first checks and examines the damaged hip joint to ensure the proper functioning of the nerves around the thigh. X-ray and CT scan are among the diagnostic tests that provide three-dimensional images of the bone structure and determine the quality of the bone. Blood tests and other laboratory tests provide the doctor with useful information about physical health and readiness for treatment.

#### **Fracture treatment after hip replacement**

Before the treatment, things like the type and location of the fracture, the physical health of the person, the quality of the bones and the extent to which the prosthesis remains healthy are examined and considered. In most patients, surgery is the only treatment option. If the prosthesis is firmly placed inside the femur bone, first the bone fragments are reduced, then they are fixed by means of metal plates and screws. In such a case, there may be a need for a graft or a bone graft to weak bones. Sometimes, due to fracture, the primary prosthesis is lost. As a result, a new prosthesis will be replaced. This surgical method is called joint replacement surgery.

#### **Recovery period after hip replacement surgery**

After surgery, antibiotics are given to the patient to prevent infection. Blood thinners also prevent blood clots in the leg. Pain after hip replacement surgery is completely normal. However, in order to relieve and control the pain, painkillers and anti-inflammatory drugs are prescribed to the patient by the doctor. Physiotherapy is one of the other measures prescribed after surgery that helps strengthen muscle strength and improve range of motion.

#### **Methods of preventing femur fracture**

- ✓ By avoiding the risk factors mentioned below, patients can prevent hip or femur fractures, which include the following:
- ✓ One of the things that prevent fracture or damage to this area is driving a person if they have used drugs or alcohol.
- ✓ Failure to comply with driving regulations such as not wearing a seat belt while driving.
- ✓ Driving a motorcycle without paying attention to the regulations in mild and rainy weather is another factor that causes damage to the lower motor organs.

#### **Osteoporosis**

A person suffering from osteoporosis is another cause of injury to the femur. According to the research conducted, one of the most important factors that cause femur fractures can be the presence of a person in contact sports without paying attention to safety points or without benefiting from safety facilities in order to maintain the health of the body. It causes femur fracture. It is worth

noting that strengthening the bones and also the muscles by performing weight-bearing sports exercises greatly reduces the possibility of injury and fracture of the femur. Therefore, it is better to perform physical therapy after femur surgery or minor injury in order to maintain the health of this moving part of the body (Figure 6).

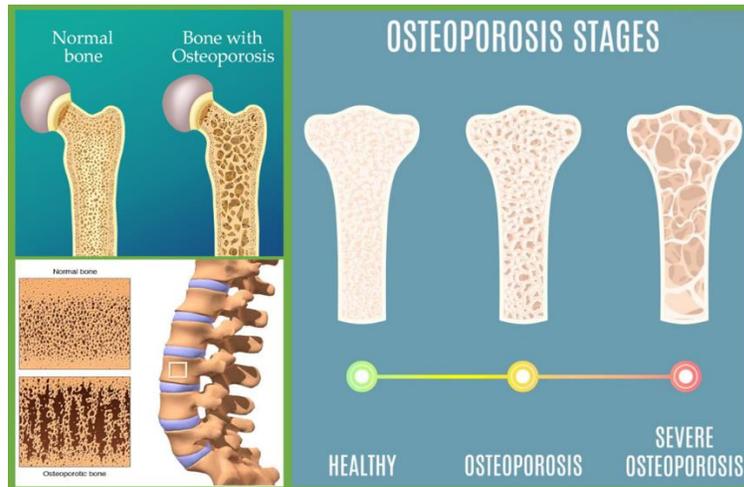


Figure 6. Osteoporosis

### Types of femur fractures

As we explained in the above material, from the medical point of view, the thigh bone is also known as the femur bone, and it is considered as one of the strongest and at the same time the largest bones in the human body. Fracture of this bone causes disruption in daily activities. Because it is considered one of the most important and fundamental bones for the purpose of walking. Fracture of femur is considered very important due to the size of this bone as well as the important and fundamental role it plays in walking. Also, this fracture is classified into several types in terms of the fracture model and its position, which include:

- 1- Fracture of the neck of the femur, which is in the upper part and near the pelvis.
- 2- Fracture of the femur.
- 3- Fracture of the condyles and the last lower part of the femur near the knee.

They are among the types of fractures in the thigh. Injury or fracture in this area mostly occurs when the femur is subjected to a severe blow, which is based on the weight of the person's body, such as falling or strong contact with an object. In general, the most common types of fractures in this sensitive part of the body can be:

- ✓ The break of an equal and equal straight line is called a transverse break.
- ✓ A fracture occurs along an angled line, which is called an oblique fracture.

- ✓ A fracture occurs along a line that rotates on the femur, which is medically called a spiral fracture.
- ✓ Bones that break into several pieces are called multi-piece fractures.
- ✓ Bones that tear the skin of a person's body and protrude from that place are called open fractures.

All the mentioned cases are types of fractures of the thigh or femur bones, which the doctor performs surgery after performing a CT scan. Experts advise this group of patients to definitely use physiotherapy after surgery in order to speed up the disease process.

### In general, the most common types of fractures in this sensitive part of the body can be:

- 1- Platinum in femur fracture: when experts connect platinum to the femur, the force and power that is transmitted to it during the movement of the bone, more than it is borne by the bone of this area, is absorbed through the platinum and the beam and it is tolerated.

### Necessary measures before femur surgery

Before performing hip surgery, specialist surgeons prescribe the necessary tests for patients to make sure that the patient is in good physical condition. These tests include:

- ✓ Blood test to measure the number of red cells in the blood.
- ✓ Checking and evaluating the condition of the patient's heart rate.

- ✓ Urine test to check infection or possible pregnancy in women.
- ✓ Performing radiology imaging of the lungs.

### Diabetes

They are among the things those expert surgeons prescribe for patients before surgery. It is better to note that some special disorders such as diabetes may slow down the healing process and treatment of the patient. This is why specialist doctors advise patients to provide them with a complete medical history before surgery. If patients are using special drugs such as anti-inflammatory drugs and also blood thinners, it is better to stop using them for a certain period of time according to the expert surgeon's opinion. In this regard, the specialist surgeon as well as the person providing primary care activities cooperate with each other so that they can obtain the necessary examinations for the purpose of the patient's body condition and health before surgery.

### Care before hip and hip joint surgery

In the first step, the orthopedic doctor receives information from the patient about the pain and movement limitations of the hip or thigh joint and the factors that are related to it, and in addition, he told him about the patient's general state of health, such as other possible diseases. It says in

this way, the patient's hip joint is reviewed and treated. In this way, it examines and evaluates the amount of movement, the shortness of the lower limb, the patient's pelvis, joint pain, the strength and ability of the lower limb, as well as the change in the appearance of the patient's body. The specialist doctor uses imaging techniques such as simple radiography to investigate the changes that have occurred in the hip joint, and sometimes he also uses a CT scan to make a more accurate diagnosis regarding the type of surgery. One of the measures that a specialist surgeon examines before hip surgery is the patient's medications.

### Benefits of femoral surgery

One of the clearest benefits of performing femur surgery can be mentioned is the significant reduction of pain in the thigh area. In general, all the patients who perform this hip operation, talk about the complete resolution or significant amount of pain. Therefore, as the amount of pain decreases and its removal gradually, the function and efficiency of the hip joint will also improve. According to the conducted studies, most of the patients see significant results from the treatment and treatment of their body shape, and the resulting results include the improvement of the range of movement organs of the lower part (Figure 7).

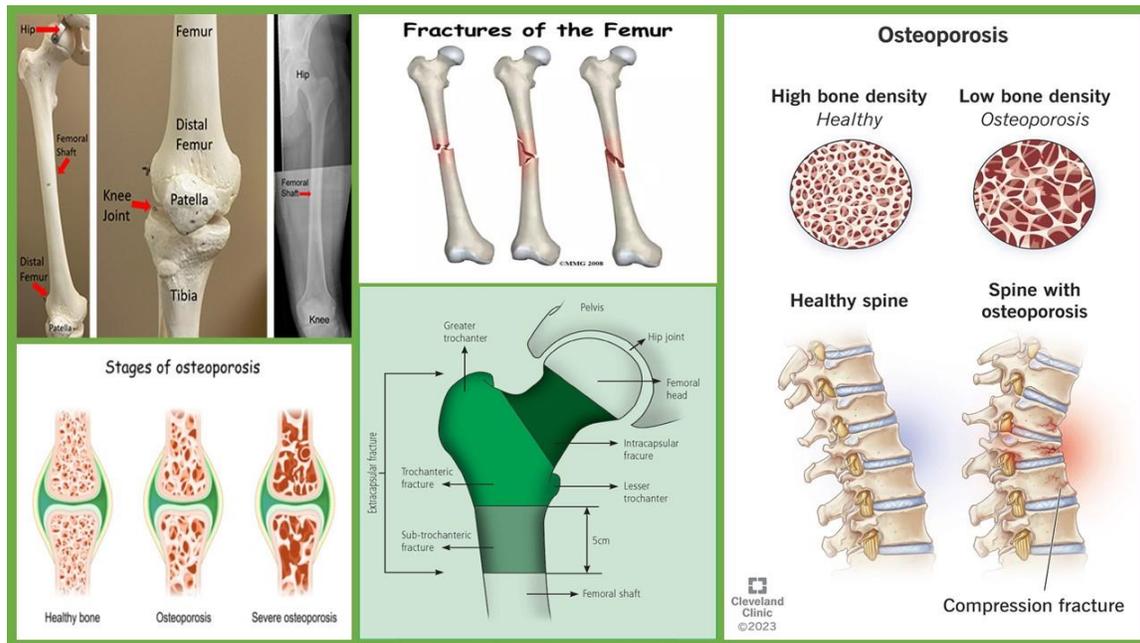


Figure 7. Benefits of femoral surgery

### Methods of diagnosing hip fracture

The first step to treat a hip fracture is to take a picture of the hip. Diagnosing hip fractures is done through imaging of the hip area and pelvic bone. In cases where the patient falls down and complains of hip pain, it is possible that a fracture occurred at the upper end of the hip bone and

cannot be detected through imaging. In such cases, magnetic resonance imaging or MRI is recommended for the treatment of hip fracture. MRI imaging reveals hidden fractures. MRI can detect hip fractures that are not detected by plain imaging. If the patient cannot have an MRI due to related medical conditions, they can use

tomography or CT instead to treat the hip fracture. CT is not as sensitive as MRI for detecting hidden fractures, but it is used to treat hip fractures.

**X-ray of the pelvis**

You lie on a bed and images are taken of your pelvis. It may be necessary to put your body in different positions so that the pictures are taken from different angles. AP view, which stands for anteroposterior, is a front-view photograph of the affected area. In this view, the X-ray is irradiated from the front to the joint. This is a standard angle view of the femur that fully shows the hip joint and femur. With the AP view, the normal position of the femur is checked. A radiologist or orthopedic specialist can diagnose a fracture [35].

**How to prepare for pelvic radiography**

- ✓ The patient must remove any metal objects before the imaging.

- ✓ If the patient has platinum in his body, because it may prevent X-rays from passing through the body, it is necessary to discuss this issue with his doctor.

**Side effects of pelvic radiography**

The amount of X-ray radiation is very low. Although the benefits of this x-ray outweigh the risks, you may be given a protective apron. If you are pregnant, or think you may be pregnant, you should tell your doctor. This process can be done in ways that protect your abdomen from radiation.

**Recovery time**

Normally, patients are discharged from the hospital three to five days after femur surgery and under special care, with the diagnosis of a specialist surgeon. Of course, the full recovery of patients after femur surgery takes between three and six months, which depends on the type of hip surgery, the degree of success in rehabilitation activities, and the general health level of the patient's body (Figure 8).

Raw	Study	Year	Severe COVID-19		non-Severe COVID-19		Proportion Wight 98%	Weight %	
			Yes	No	Yes	No			
1	Wang et al.	2021					0.85	[0.39 – 1.02]	6.02
2	Kragholm et al.	2021					0.83	[0.42 – 1.01]	5.92
3	Papadopoulos et al	2021					0.74	[0.55 – 1.02]	5.65
4	Team	2020					0.91	[0.48 – 1.08]	6.03
Heterogeneity $t^2=0.00, I^2=0.00, H^2=1.00$							0.98	[0.20 – 1.08]	
Test of $\theta = \theta, Q(4) = 3.99, P = 0.66$									
1	Hafeez et al.	2020					0.68	[0.52 – 1.06]	6.02
2	Wang et al.	2020					0.74	[0.31 – 1.08]	5.92
3	Guan et al	2020					0.89	[0.19 – 1.01]	5.65
4	Zhang et al	2020					0.90	[0.29 – 1.02]	6.03
Heterogeneity $t^2=0.00, I^2=0.00, H^2=1.00$							0.98	[0.20 – 1.06]	
Test of $\theta = \theta, Q(4) = 4.44, P = 0.71$									
1	Piva et al.	2020					0.92	[0.39 – 1.06]	5.03
2	Zhang et al.	2020					0.87	[0.54 – 1.02]	6.02
3	Haghighi et al.	2020					0.88	[0.63 – 1.01]	5.57
4	Jebril	2019					0.60	[0.25 – 1.08]	6.13
Heterogeneity $t^2=0.02, I^2=0.00, H^2=1.00$							0.95	[0.22 – 1.07]	
Test of $\theta = \theta, Q(4) = 5.55, P = 0.74$									

Figure 8. Forest plot showed Patients with Lower Limb Plastic Surgery (femur fracture) and Vascular Embolism Based on Ultrasound, Radiology and ICU Points

One of the strongest and also the largest bones of the human body belong to the thigh bone, which is also known as the femur bone. The fracture of this bone causes disruption of daily activities. Because it is considered one of the most important and main bones for walking. After the specialist surgeons have diagnosed the cause of the hip

**Conclusion**

fracture after performing a CT scan, they perform surgery. Specialists advise all patients who have undergone hip surgery to perform physical therapy after femur surgery in order to accelerate the improvement of the physical condition. Fracture of the proximal femur is one of the most common injuries in the elderly. However, no results other than surgery after the second year have been reported in the literature. Also, osteoporosis is a chronic disorder and several factors lead to osteoporosis. With age, the level of hormones decreases and reduces bone density and makes bones more fragile. Pelvic femoral fractures are more likely to result from severe trauma such as road traffic accidents, unless the fracture is pathologic in a patient with osteoporosis or metastatic disease. These people often experience injuries in the thigh, hip femur, knee and other parts of the body. As we have already mentioned, the fracture is different in terms of degree and complexity and depends on the amount of applied pressure. These fractures may be transverse, oblique, spiral, comminuted, open or closed. Age-related bone mineral density loss and osteoporosis are the main factors that put older people at greater risk for hip fractures, even with mild trauma. Various factors increase the risk of hip femur fracture. Fractures of the hip femur are common in the elderly (over 70 years old). Because they are more prone to osteoporosis and decreased bone density. In fact, the risk of these fractures increases exponentially with age, and women are more likely than men due to weak bones, pregnancy and menstruation. Among other things that can increase the risk of hip femur fracture, we can mention heavy sports with lots of exercises and high pressure on this bone. Of course, accidents are also an important factor that cannot be prevented or managed.

### References

[1] A.A Esmailzadeh, et al., *Nanomedicine Research Journal*, 2022 7 (4), 370-377  
[2] H Shahoon et al, Multi vesicular osseous hydatid disease of the mandible-a case report, *Iranian journal of parasitology*, 2010, vol 5, issue 1, 55  
[3] M Yaghmaei et al, comparison of betadine and normal saline in the irrigation of tooth socket on the complications after surgical removal of impacted wisdom teeth, *Journal of dental school shahid Beheshti university of medical science*, 2006, vol 23, issue 466, 683-688  
[4] H Shahoon et al, Evaluation of hydroxyapatite nanoparticles on the human peripheral blood mononuclear cells: An in vitro study; *J Medwell journal*, 2010, vol 512, 764-768  
[5] M Akhlaghdoust et al , AIDS Attitude in first-year students with History of sexual Behaviors: A cross-sectional study, Meisam Akhlaghdoust et al; *International Journal of High Risk Behaviors and Addiction*: September 15, 2019. vol.8(3) ;e94612  
[6] H Shahoon et al, Evaluation of Nano silver particles cytotoxicity on L929 fibroblast cells by MTT assay: an in

vitro study, *Journal of Research in dental sciences*. 2011; vol 8, issue 2: 53-59  
[7] H Shahoon et al, Evaluation of hydroxyapatite nanoparticles biocompatibility at different concentrations on the human peripheral blood mononuclear cells: an in vitro study, *Res J Biol sci Journal*; 2010, 5(12): 764-768.  
[8] H Shahoon et al, Comparison of the human bone matrix gelatin (HBMG) WITH AUTOGENOUS BONE GRAFT IN RECONSTRUCTION OF THE PARIETAL BONE DEFECTS IN RAT: a histological and radiographic study, *Journal of dental Research, dental clinics, dental prospects*, vol 3, issue 2, 37  
[9] H Norooziseyehosseini et al, The effect of omega-3 and omega-6 fatty acids on the mental and physical health of children, adolescents, and adults; 2023, vol .1  
[10] H Shahoon et al, Comparison of the Efficacy of the BMP-2 Along with Nanosilver and Nanotitanium on Ectopic calcification of the Rectus Abdominis muscle of rats; *Journal of pharmaceutical negative results*, 2022; 13(09): 4368-4376  
[11] M Motaqi et al, Treadmill Exercise and Effect on Rehabilitation of patients after Ischemic stroke: A Narrative study, *international Journal of Musculoskeletal pain prevention*; vol 7(3): 730-740  
[12] M Orori et al, The evaluation of head and neck neoplasm in young and old adults, *Social Determinants of Health*, 2019; vol.5(2): 117-125  
[13] M.M. Fard, et al., *Journal of Chemical Reviews*, 2019 3 (3), 181-195

[14] A Parsaei et al, Oral health-related quality of life in rheumatoid arthritis: a comparative analysis, *BMC rheumatology Journal*; 2022, 6(1): 1-10  
[15] H Ashraf et al, Biocompatibility of an experimental endodontic sealer (Resil) in comparison with AH26 and AH-plus in rats: An animal study, *Journal of dental Research, dental clinics, dental prospects*, 2022, vol 16, issue 2, 112  
[16] H Shahoon et al, Evaluation of cytotoxicity of hydroxyapatite nanoparticles on L929 fibroblast cells, *Daneshvar medicine*, 2020, vol 19, issue 4, 27-34  
[17] Joanne Thanavaro DNP et al, Factors affecting STEMI performance in six hospitals within one healthcare system, *ELSEVIER*; 2021, 50(5): 693-699  
[18] Soheila Sayad; et al, Is software method helpful for detection of angiogenesis in breast tissue slides? , *Journal of Preventive Epidemiology*. 2020; 4(2): e16-e16  
[19] Seyyed AY Ahmadi; et al, Expression of angiogenesis-related genes in a group of Iranian cases of breast cancer, *Current Pharmacogenomics and Personalized Medicine (Formerly Current Pharmacogenomics) Journal*. 17(3): 197-205  
[20] Soheila Sayad; et al, Epidemiological and pathological characteristics of postsurgical cases of invasive breast cancer among ethnicities of Iran in 2018: A single center

- cross-sectional study, *Archive of Oncology Journal*.2020 ;26(1): 6-9
- [21]Faranak Rokhtabnak;et al, Pain control after mastectomy in transgender patients: ultrasound-guided pectoral nerve block II versus conventional intercostal nerve block: a randomized clinical trial, *Anesthesiology and Pain Medicine Journal*. 2021; 11(5): e119440.
- [22]Mohammad Esmaeil Akbari;et al, Prognostic factors of recurrence (early and late) and death in breast cancer patients in Iranian women, *International Journal of Cancer Management*.2016;9(6)
- [23]AH Maleki,A Gholami,M Mohammadi, A Farhoudian, S Hassani;Investigation of medical services in patients with Diabetes,cardio-vascular and Rheumatology disease in ICU,*Journal of pharmaceutical Negative Results*.2022;13(10):4137-4158
- [24]Mohammadreza Karoobi;et al, Comparative Clinical Outcomes of Using Three-Dimensional and TIGR Mesh in Immediate Breast Reconstruction Surgery for Breast Cancer Patients, *Journal of Plastic, Reconstructive & Aesthetic Surgery*, *Journal of Plastic, Reconstructive & Aesthetic Surgery*.2023
- [25]Mohammadreza Karoobi;et al, Comparative Clinical Outcomes of Using Three-Dimensional and TIGR Mesh in Immediate Breast Reconstruction Surgery for Breast Cancer Patients, *Journal of Plastic, Reconstructive & Aesthetic Surgery*, *Journal of Plastic, Reconstructive & Aesthetic Surgery*.2023
- [26]M Farbod;et al, Association of IL-8-251T> A and IL-18-607C> A polymorphisms with susceptibility to breast cancer—a meta-analysis, *Klinicka Onkologie: Casopis Ceske a Slovenske Onkologicke Spolecnosti Journal*.35(3):181-189
- [27]Siavash Masoumi Jouibari;et al, Investigation of relapse and the measure of tumor free safe margin in the breast cancer patients undergoing breast conservation surgery: A descriptive study in Firoozgar center of Tehran .(2016-2018); 23:161-169  
SAA Mousavi chashmi et al ,plastic, Reconstructive and burn surgery with a clinical Approach;2022,vol 1:140.
- [28]Mohammad Esmaeil Akbari;et al, Research Article Breast Cancer Status in Iran: Statistical Analysis of 3010 Cases between 1998 and 2014, *International Journal of Breast Cancer*, Volume 2017
- [29]H Rahmani Youshanouei,et al, Mesenchymal Stem cells as a bright therapeutic strategy for SLE: A Comprehensive Review, *Journal of NeuroQuantology*.2023;21(5): 334-364
- [30]F Hosseinzadegan et al,cardiovascular disease and relationship with mortality and severe covid19 in patients with covid19:A systematic review and meta-Analysis; international journal of special education,2022,vol 37(03):12609-12617
- [31]Bryan J Neth,et al, Glomus coccygeum masquerading as chordoma, *Canadian Journal of Neurological Sciences*.2023:1-4
- [32]Z Chakeri,S Hassani,SM Bagheri,A Salmanipur,N Maleki;Child Thoracic osteoid osteoma;case presentation,Review of Radiology and Management case Report,*Journal of clinical and medical images*.2022;2(3)
- [33]H Seifmanesh,A Afrasiabi,H Hosseinpour,V Tajiknia, S Hassani;Role of MRI in Pre-operative Assessment of patients with Advanced ovarian cancer candidate for cytoreductive surgery,A Brief Review,*Journal of Obstetrics Gynecology and Reproductive sciences*.2022;5(9)
- [34]F Beiranvandi,Ah Jalali,S Hassani,A Zare,T Ziaadini,Systematic investigation of cardiovascular & clinical problem in patients with covid-19 with Neurological and pathological point,*The Seybold Report*.2023;18(4):1634-1653
- [35]A Afrasiabi, A ModarresiEsfe, F Vahedifard, S Hassani,Artificial intelligence for radiomics;diagnostic biomarkers for neuro-oncology,*Word Journal of Advanced Research and Reviews*.2022;14(3):304-310
- [36]S Hassani,M Rikhtehgar,A Salmanipur,Secondary chondrosarcoma from previous osteochondroma in pelvic bone,*GSC Biological and pharmaceutical sciences*.2022;19(3):248-252
- [37]H Rahmani Youshanlouei,et al, Advancements In Mesenchymal Stem Cell Therapy For Stroke: Promising Clinical Outcomes And Potential Role Of Extracellular Vesicles, *Journal of Pharmaceutical Negative Results*.2022;13(8): 5204-5211
- [38]Mahdi Rezaei,et al, Mesenchymal Stem Cell Therapy For Alzheimer's Disease: A Review Of Msc-Derived Extracellular Vesicles In Clinical And Preclinical Models, *Journal of Pharmaceutical Negative Results*.2022, 11139-11148
- [39]Zeinab Shormeij;et al, Prognostic Factors of Recurrence (Early and Late) and Death in Breast Cancer Patients in Iranian Women, *Iranian Journal of Cancer Prevention*: 9(6); e5747
- [40]A Ghasemzadeh,N Zabandan,AH Mohammadalizadeh, S Habibollahi,E Alamoutifard,MJ Namazi,M Rezasoltani,Is fatty liver associated with post-ERCP pancreatitis,*Journal of Archives of pharmacy practice*.2020;1:119
- [41]SM Shushtarian,M Rezasoltani,MJ Namazi, Retina Amacrine cell study by flash Electroretinogram test in patients with color blindness,*Journal of Advanced pharmacy Education& Research*.2020;10:(s2)
- [42]Moshar, MR Soltani, MJ Namazi,Angiographic examination in patients with Myocardial infarction with

and without ST segment elevation, *Journal of Advanced pharmacy Education & Research*.2020;10:(s2)

[43] S Habibollahi Khaled hamid, M Eghballejad mofrad, SMA Alavi, MJ Namazi, Too long and persistent hiccups can be the only symptom of covid-19, *Journal of Advanced pharmacy Education & Research*.2021;10(s4):185-186-187

[44] Z Chakeri, S Hassani, SM Bagheri, A Salmanipur, N Maleki; Child Thoracic osteoid osteoma; case presentation, *Review of Radiology and Management case Report, Journal of clinical and medical images*.2022;2(3)

[45] T Faghihi, et al, Correlation of hematologic indices with CT-pulmonary Arterial obstruction index in patients with Acute pulmonary Emboli, *International journal of cardiovascular practice*.2019;4(3):89-93

[46] M Yarjanli, et al, the comparison of serum 25-hydroxy vitamin D in pre-diabetic patients and individuals with Normal Gender among the patients Referred to.....*journal of Biochemical Technology*.2020;11(1):91-96

[47] Fatos et al, Challenging clinical presentation of zinner syndrome,; *Radiology case Report journal*, 2023. vol18, issue 1, 256-259

[48] A Afrasiabi, A ModarresiEsf, F Vahedifard, S Hassani, Artificial intelligence for radiomics; diagnostic biomarkers for neuro-oncology, *Word Journal of Advanced Research and Reviews*.2022;14(3):304-310

[49] R Masaeli et al, preparation, characterization and investigation of in vitro and in vivo biological properties of strontium-modified; *Materials science and Engineering:c*, 2016, vol 69, 780-788

[50] N. Mohsen, H. Jaber, M. Maryam, S. Elham, J. Amin, *Eurasian Journal of Chemical, Medicinal and Petroleum Research*, 2022, 1 (5), 99-110

[51] Ilir Ahmetgjekaj et al, Annular pancreas: Beneath the intestinal obstruction\_A case report, *Radiology case Report journal*, vol 18, issue 3, 1364-1367

[52] M Naghdipour et al, The effect of pelvic floor muscle fatigue on stress urinary incontinence: A systematic review ; *Iranian journal of obstetrics, gynecology and cancer research*, 2021, 24(7):29-36

[53] Javedani Masroor M, Sheybani H, Sheybani S, Abolghasem N. Anti-mullerian hormone levels before and after ovarian drilling in polycystic ovary syndrome: has this an effect on fertility?. *Reproductive Biology and Endocrinology*. 2022 Dec;20(1):1-6.

[54] Mahdi Rezaei et al, Mesenchymal stem cell therapy for Alzheimers Disease: A review of Msc-Derived Extracellular vesicles in clinical and preclinical models, *journal of pharmaceutical negative result* ,vol 13, si 09, 2022

[55] Mojgan Javedani Masroor et al, The Effect of Uterine Contractions on Fertility Outcomes in Frozen Embryo Transfer Cycles: A Cohort Study. *Journal of The National Center for Biotechnology Information*, 2023 Apr-Jun; 24(2): 132-138.

[56] Arshin Ghaedi et al, Systematic review of the significance of neutrophil to lymphocyte ratio in anastomotic leak after gastrointestinal surgeries, *BMC Surgery journal*, vol 24

[57] R Jamali et al, Evaluation of the changes in serum levels of ast, alt and ALKP before and after two cyclosporine regimens, Mycophenolate mofetil, and tacrolimus, mycophenolate mofetil in Kidney transplant patients admitted to sinai hospital from 2016 to 2018, *journal of pharmaceutical negative result*, vol.13, si 09, 2022

[58] S Pirirani, H Soleimankhani, A Motamedi Shalamzari, S Sayyad, *Biannual Journal of the Iranian Psychological Association*, 2019, 13(2), 99-108

[59] Ali Shariati et al, Advancements in Mesenchymal stem cell therapy for stroke: promising clinical outcomes and potential role of Extracellular vesicles, *journal of pharmaceutical negative result* ,vol 13, si 08, 2022

[60] L Zhang et al , oncolytic viruses improve cancer immunotherapy by reprogramming solid tumor microenvironment; *medical oncology journal*, 2023, vol 41(1):8

[61] FB Ah Jalali, S Hassani, A Zare, T Ziaadini, *The Seybold Report*, 2014 18 (04), 1634-1653

[62] Global incidence of surgical site infections following caesarean section: a systematic review and meta-analysis, M Farid Mojtahedi et al, *National center for Biotechnology information*, 2023, vol 139, 82-92