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ORIGINAL ARTICLE

Sciatic Nerve Traction Injuries in THR after Old Trauma of Neck of Femur Fracture more Than 3 Months

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ABSTRACT

Aim: The purpose of this study is to measure the sciatic Nerve injuries in Total Hip Replacement after the old trauma of femur fracture more than 3 months.

Materials and Methods. The design of this study was retrospective study design and this study was conducted at DHQ Teaching Hospital Gujranwala. Data was collected of Total 50 patients who underwent Total Hip Replacement following trauma of NECK of femur fracture. All Patients underwent through Total Hip Replacement surgery. Sciatic nerve traction injuries were noted. SPSS – 16 was used for statistical analysis of the data and for the calculation of the mean and SD. Mann-Whitney U test and Student's t- test were also used for the analysis of the mean and SD in consideration with the p-value of (< 0.05).

Results: Out of 50 patients, 5 patient developed Sciatic nerve injuries and 1 developed Femoral nerve injury. Out of these 5 Patients, cause of sciatic nerve injury in 3 patients was formation of hematoma and the cause of 2 sciatic nerve injuries and femoral nerve injury was trapping of the nerve due to scarring. However, the outcome of 4 out of 6 (66.66%) patients was Good, 1 (16.66%) had satisfactory result while the one patient (16.66%) with sciatic nerve injury developed total paralysis with poorer prognosis.

Practical Implication: Sciatic nerve traction injuries can occur as a complication of total hip replacement (THR) surgery, especially after old trauma such as neck of femur fracture that occurred more than 3 months prior to the surgery. Such injuries can result in significant pain, weakness, and other functional impairments that can affect the patient's quality of life. Therefore, it is important for surgeons to carefully evaluate the patient's medical history and perform appropriate diagnostic tests to identify the risk of nerve injury before THR surgery. Furthermore, during surgery, surgeons should use techniques to minimize the risk of nerve injury, such as careful placement of implants and avoiding excessive traction on the sciatic nerve. Early detection and prompt management of sciatic nerve traction injuries can help to optimize patient outcomes and prevent long-term disability

C**onclusion:** Sciatic Nerve injuries are common in THR after trauma to the neck of femur. So, these must be ruled out and proper management should be done.

Keywords: Total Hip Replacement, Femur Neck Fracture, Sciatic Nerve Injury, Trauma.

INTRODUCTION

Sciatic nerve traction injuries are a potential complication following total hip replacement (THR), particularly in patients with a history of neck of femur fracture that occurred more than 3 months ago [1]. The sciatic nerve is the largest nerve in the body, and it originates in the lower back and travels down the back of the leg [2-4]. During a THR surgery, the surgeon must navigate around this nerve to access the hip joint, which puts the nerve at risk of being stretched or compressed. Trauma to the neck of the femur, or hip fracture, is a common injury that typically affects elderly individuals with underlying osteoporosis [2]. The femur neck connects the shaft of the bone to the ball-shaped hip joint and is susceptible to damage due to falls, direct trauma, or accidents [3].symptoms of sciatic nerve traction, also known as sciatic nerve tension, may include: [5] Pain is one of the most common symptoms of sciatic nerve traction. The pain may be felt in the lower back, buttocks, thighs, or legs. It can be sharp, shooting, burning, or dull.

Some people may experience numbness or tingling in the affected area. This sensation may be intermittent or constant and can range from mild to severe. Weakness in the affected leg or foot is another symptom of sciatic nerve traction. This weakness may make it difficult to stand, walk, or lift objects. Tightness or stiffness in the muscles of the lower back, hips, and legs is common in people with sciatic nerve traction. Sciatic nerve traction can limit a person's mobility, making it difficult to perform everyday activities such as walking, standing, or bending. The pain associated with sciatic nerve traction may worsen with certain activities, such as sitting, standing for long periods, or bending over. The pain may radiate from the lower back down to the buttocks, legs, and feet. In rare cases, sciatic nerve traction can cause bowel or bladder dysfunction, such as incontinence or retention. If you experience these symptoms, seek medical attention immediately. Hip fractures usually require surgical intervention, with the specific procedure determined by the location and severity of the fracture. Rehabilitation and physical therapy are critical components of postoperative care to regain strength, flexibility, and mobility [6]. Complications, such as blood clots, pneumonia, pressure sores, and muscle weakness, can arise following a hip fracture, with the risk increased in elderly patients or those with comorbidities.

Trauma to the neck of the femur, such as a fracture, can increase the likelihood of sciatic nerve traction injuries during THR [7-8]. This is because the injury may have caused changes in the anatomy of the hip, such as displacement of bone fragments, that can make the surgery more challenging. [9] Additionally, scarring from the old injury can make the soft tissues around the nerve more adherent, increasing the risk of injury [10]. Sciatic nerve traction injuries can cause a variety of symptoms, including pain, numbness, tingling, and weakness in the affected leg [11,12].

Significance of the study: In severe cases, the patient may experience foot drop, which is an inability to lift the foot off the ground. These symptoms can have a significant impact on a patient's quality of life and may require further medical intervention.

MATERIALS AND METHODS

The design of this study was retrospective study design and this study was conducted at DHQ Teaching Hospital Gujranwala. This study was conducted after the consent of patients and after approval from Hospital ethical committee. All the patients who were having history of Trauma to the neck of femur underwent Total Hip Replacement surgery. The surgical treatment of THR involves the following steps:

Anesthesia: The patient was given general anesthesia

Incision: A large incision was made in the hip area to access the hip joint.

Hip joint Exposure: The surgeon Dislocated the hip joint to expose the acetabulum and femur. The damaged cartilage and bone were then removed from the joint.
Prosthesis Implantation: The prosthesis was implanted into the hip joint. The acetabulum was then prepared and a ceramic cup was inserted to replace the damaged socket.
Closure: The incision was closed with sutures. A drain was inserted to remove any excess fluid from the surgical site.
Recovery: After surgery, the patients were taken to a recovery room where their vital signs were monitored. Pain medication was given to manage pain and swelling. Physical therapy was started to help the patient regain mobility and strength.
Statistical Analysis: SPSS 16 was used for statistical analysis of the data and for the calculation of the mean and SD. Mann-Whitney U test and Student's t- test were also used for the analysis of the mean and SD in consideration with the p-value of (< 0.05).

RESULTS

Total 50 patients aged 35-58 Included in this study.30 were females and 20 were male Patients Out of 50 patients, 5 (10%) patient developed Sciatic nerve injuries . Out of these 5 Patients, cause of sciatic nerve injury in 3 (60%) patients was formation of hematoma and the cause of 2 (40%) was trapping of the nerve due to scarring. One patient developed Femoral nerve injury. However, the outcome was satisfactory in this case, as the cause was mild scarring.

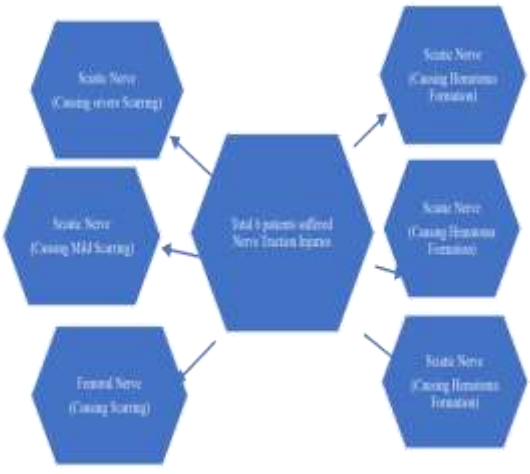
Table 1: Showing Demographic Details of Patients

Sr.No	Parameters	Features
1.	Age(years)	35-58
2.	Gender Male Female	 20 30
3.	BMI (kg/m2)	24.6- 31.7
4	Race	Asian

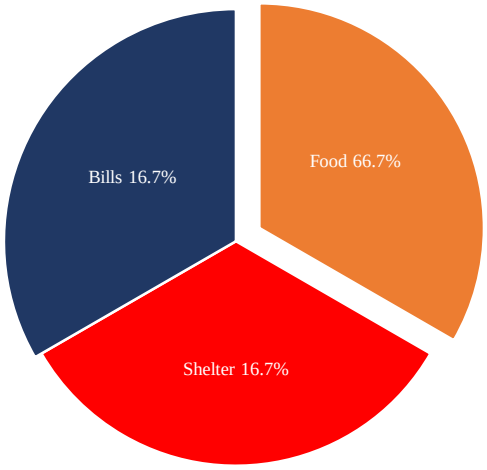
Table 2: Illustrating Cause and Outcomes of Nerve Traction Injuries

Serial No.	Type of injury	Cause of injury	Outcome
1	Sciatic nerve	Hematoma	Good
2	Sciatic Nerve	Hematoma	Good
3	Sciatic nerve	Hematoma	Good
4	Sciatic Nerve	Mild scarring	Good
5	Sciatic Nerve	Scar formation	Poor
6	Femoral Nerve	Scarring	Satisfactory

However, the outcome of 4(66.66%) patients was Good, 1(16.66%) had satisfactory result while the one(16.66%) patient with sciatic nerve injury developed total paralysis with poorer prognosis.



Graph 1: Explaining Cause of Injuries



Graph 2: Quantitative Analysis of Sciatic Nerve injury (Prognosis of Nerve Injury)

DISCUSSION

The sciatic nerve is the longest nerve in the body. The sciatic nerve is a nerve bundle that originates from the L4-S3 nerve roots in the spinal cord and travels through the buttock, posterior thigh, and lower leg to the foot. It is the largest and longest nerve in the body, measuring up to 2 cm in diameter and 80 cm in length [15]. The sciatic nerve provides motor innervation to the hamstring muscles, as well as the muscles of the lower leg and foot. It also provides sensory innervation to the skin of the posterior thigh, the entire leg, and the sole of the foot. During THR surgery, the sciatic nerve can be stretched or compressed, leading to various complications, such as nerve injury, weakness, numbness, and even paralysis of the leg [13].When a patient has a history of old trauma to the neck of the femur, the surgical procedure is typically more challenging, as there may be a lack of bone stock and proper alignment of the hip joint [14]. The surgeon may need to use more aggressive techniques to remove the damaged bone and properly align the joint, which may increase the risk of nerve injury [15].

Femoral neck fractures often occur in the middle-aged and the elderly, and are often associated with osteoporosis and other medical diseases; falls and twisting can lead to fractures. Following traffic accidents and high-energy trauma, young adults can also suffer femoral neck fractures. There are different treatment schemes depending on the age of the patient and the type of femoral neck fracture [17]. In clinical practice, the most suitable treatment method is generally selected through the evaluation of patients' overall health status, age, fracture classification, and other aspects. Elderly patients with femoral neck fractures are often characterized by poor general health, often accompanied by a variety of complications. Conservative treatment requires long-term bed rest, so that patients are prone to pulmonary infection, pressure sores, deep venous thrombosis, and other serious complications, which can be life-threatening. For elderly patients with femoral neck fractures, in the absence of absolute surgical contraindications, most of them advocate total hip arthroplasty for treatment [18]. Through the reconstruction of hip joint function, total hip arthroplasty can relieve joint pain, correct deformity, restore hip joint motor function, and effectively improve the prognosis of patients19. It is the main method used to treat femoral neck fractures in the elderly. The choice of surgical approach for total hip arthroplasty is closely related to the recovery of hip joint function, the stability of the artificial prosthesis, and the risk of dislocation. The destruction of muscle and soft tissue using the surgical approach can affect the stability of the hip joint and increase the risk of dislocation. Therefore, reducing the soft tissue

injury without affecting the curative effect of artificial prosthesis implantation is critical to the success of the operation and an important factor in determining the ideal surgical approach. At present, the posterolateral approach is the most widely used approach in conventional total hip arthroplasty. This approach is risks damaging the sciatic nerve. In addition, this approach requires resection of the posterior external rotator muscle and the articular capsule of the hip joint, which causes excessive muscle and soft tissue damage, and increases the degree of surgical trauma and the amount of bleeding. At the same time, the resection of the posterior circumflex muscle groups of the hip joint will affect the abduction strength of the affected limb, which is disadvantageous to the early functional recovery of the patient. It is especially dangerous for elderly patients with poor muscle strength and physical coordination. It prolongs the rehabilitation time, increases the hospitalization time, and increases the hospitalization cost. It will have a great impact on the financial and nursing burden of patients and families.

Additionally, the patient's pre-existing condition may cause the sciatic nerve to be more vulnerable to injury, as it may be already compressed or stretched due to the previous trauma [16]. The length of time between the initial injury and the THR surgery also plays a significant role in the patient's recovery. If there has been a delay of more than three months, the muscles around the hip joint may have atrophied, making it more challenging to properly position the hip during surgery [17-18]. In this study, Total 50 patients aged 35-58 Included in this study. Out of 50 patients, 5 (10%) patient developed Sciatic nerve injuries . Out of these 5 Patients, cause of sciatic nerve injury in 3 (60%) patients was formation of hematoma and the cause of 2 (40%) was trapping of the nerve due to scarring. However, the outcome of 4(66.66%) patients was Good, 1(16.66%) had satisfactory result while the one(16.66%) patient with sciatic nerve injury developed total paralysis with poorer prognosis. To avoid sciatic nerve traction injury in patients with a history of old trauma to the neck of the femur, surgeons should take extra precautions during the surgical procedure. They may opt for a posterior approach to the hip joint, as this can provide better visualization of the sciatic nerve and reduce the risk of injury. In some cases, the surgeon may also use neuromonitoring to identify any nerve damage during the procedure [19 -20].It is essential to carefully monitor the patient's recovery following THR surgery, particularly in those with a history of old trauma to the neck of the femur. Patients should report any symptoms of nerve damage, such as weakness or numbness in the leg, to their healthcare provider immediately [21-22]. In summary, sciatic nerve traction injury is a rare but significant complication of THR surgery, particularly in patients with a history of old trauma to the neck of the femur. Surgeons should take extra precautions during the surgical procedure, and patients should be carefully monitored during their recovery to ensure that any complications are promptly identified and treated [23].

CONCLUSION

In conclusion, sciatic nerve traction injuries can occur as a complication of total hip replacement (THR) surgery, especially after old trauma such as neck of femur fracture that occurred more than 3 months prior to the surgery. Such injuries can result in significant pain, weakness, and other functional impairments that can affect the patient's quality of life. Therefore, it is important for surgeons to carefully evaluate the patient's medical history and perform appropriate diagnostic tests to identify the risk of nerve injury before THR surgery. Furthermore, during surgery, surgeons should use techniques to minimize the risk of nerve injury, such as careful placement of implants and avoiding excessive traction on the sciatic nerve. Early detection and prompt management of sciatic nerve traction injuries can help to optimize patient outcomes and prevent long-term disability.

Conflict of Interest: Authors found no conflict of interest in this study.

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