Right Proximal Tibia Open Reduction Internal Fixation

Nicolette Kowalski, Shawn D. Felton, Jason C. Craddock
Florida Gulf Coast University, Department of Rehabilitation Sciences, Fort Myers, FL USA

Abstract

Background: This case report presented a 57 year-old female patient (152 cm tall and 41 kg). Patient fell and had pain isolated to the right knee. X-rays confirmed a proximal tibia displaced fracture. Surgery was needed to set the bone back into place. A right proximal tibia open reduction internal fixation (ORIF) was performed. Difficult diagnostic problems with this type of operation would be seen in the operating room and also once the patient has healed and is outside of the human body. In this case a ORIF surgery was called an internal fixation because the fixation takes place or also known as setting back in place. After the bone is set, it is then fixed with screws, rods, plates and pins. It is called an internal fixation because the fixation takes place internally unlike other types of fixations that are on the outside of the human body. In this case a ORIF surgery was performed to the right proximal tibia of the patient. The patient received an internal fixation that involved 12 screws to help hold the tibia into place. If a patient is receiving ORIF, it is probably due to a trauma that displaced the bone. The surgery along with the trauma can cause complications to the patient. These complications can be seen in the operating room and also once the patient has healed and is progressing through rehabilitation. One particular complication that can occur with a proximal ORIF on the tibia is early onset of osteoarthritis. According to the literature the incidences of osteoarthritis after a proximal tibia fracture varies between 10% and 58% of all cases (van Dreumel, van Wunnik, Janssen, Simsek, & Cuesta, 2015). Proximal tibia fractures accounts for approximately 1% of all fractures (van Dreumel et al., 2015). These type of fractures happen because of force. The anatomical valgus angulation in the knee joint causes the lateral femoral condyle to press into the lateral tibia plateau (van Dreumel et al., 2015). This type of fracture may be treated non surgically but possess many complications with trying to re-establish stability within the knee joint (van Dreumel et al., 2015). That is why most proximal tibia fractures are operated on with the ORIF procedure (van Dreumel et al., 2015).

Case Report

Patient: This patient was a 57 year-old female patient (152 cm tall and 41 kg) that received ORIF secondary to receiving a right proximal tibia fracture. The following information will explain the mechanism of injury, clinical assessments, radiographic findings, diagnosis, and treatments to provide additional information to this patient’s unique injury.

Mechanism of Injury: Most proximal tibia fractures that result in needing ORIF surgery are due to a traumatic incident. In this case, the patient was outside using a ladder. The patient fell from the ladder onto her leg.

Radiographic Findings: The patient was transported to the hospital where an x-ray was performed. The results revealed a proximal displaced tibia fracture on the right leg.

Treatment: Following the diagnoses, it was determined that the tibia had to be fixated. Surgery was performed the same day. Open reduction internal fixation surgical procedure was done on the right proximal tibia. The patient received a total of 12 screws to fixate the bone.

Clinical Examination: An evaluation was done 6 weeks post operation by a physical therapist. At the initial evaluation, the patient presented with no pain around the site of surgery. Most of the pain was located at the patients ankle. The patient had measurable pitting edema in the right ankle. There was no indication of infection from the surgery. The patient had strength deficits in the quadriceps, hamstring along with ankle dorsiflexion and plantar flexion range of motion. Patient came into physical therapy on a walker to be progressed to no assisted device.

Rehabilitation and Results

Following surgery, the patient was instructed to be non weight bearing for six weeks. The patient arrived at rehabilitation on a walker. During rehabilitation the patient transitioned from a walker to a cane and eventually needed no assistance to walk. On initial evaluation, 6 weeks post operation, the patient presented with little to no pain near the site of surgery. Most of the pain was located in the patients ankle. Patient had a quality but weak VMO contraction. Rehabilitaiton focused on first reducing the pain and the swelling. The swelling in the ankle remained constant for three weeks. All complaints of pain from the patient were due to the ankle, not the site of surgery. To help reduce edema in the ankle, retrograde massage was continuously applied with elevation of the lower extremities. The patient got knee high compression socks to also help with the swelling. While focusing on reducing edema in the ankle, range of motion was gained at the knee by using passive range of motion stretching techniques. The quadriceps muscles were strengthened by implementing LAsQs and SAQs. After the quadriceps strength was improving, the patient transitioned quickly from using a walker to a cane and was not using any assistive device by the third week of therapy. After the 10th visit, a full evaluation of all the measurements were re-assessed. The patient had gained full range of motion back in both the knee and the ankle along with full strength in the ankle and quadriceps. The patient had a notable strength deficit in the hamstring remaining. Therapy began to focus more on strengthening the hamstrings by implementing hamstring curls. Overall, the patient left with full improvement in the right lower extremity.

Discussion and Summary

Overall proximal tibia fractures are often caused by a severe trauma. There are many long term and short term complications that are seen with this type of fracture. The most common way to treat this fracture is to do an open reduction with internal fixation surgery. Depending on the patients there may be a better option but the open reduction with internal fixation method is widely used. After the surgery it is common to see deficits in the VMO and difficulty gaining the quality of VMO contraction. In this case, the patient had most strength deficits in the hamstring and not the quadriceps. The patient also had excessive edema and pain in the ankle and not at the surgical site.

Conclusion

When it comes to any invasive surgery, it is common to have muscle weakness after the surgery. The literature demonstrates that typically after this type of surgery, the weakness would be seen in the vastus medialis oblique. The patient experience hamstring weakness likely secondary to not focusing any strengthening exercises on the hamstrings. The rehabilitation approach was to help improve quality of quadriceps contraction. The patient became sedentary after the surgery and not using the muscles likely resulting in overall weakness, including the hamstrings.

References