Case Report

Acute Closed Traumatic Sciatic Nerve Injury: A Complication of Heterotopic Ossification and Prominence of the Femoral Nail: A Case Report

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The report of a 27-years-old man with presence of heterotopic ossification (HO) after femoral nailing 7 years ago who developed foot drop after falling to the ground on his buttocks. Radiographs revealed a prominence of the femoral nail with HO in his right hip. EMG confirmed peroneal nerve injury of the hip region. Femoral nail and the HO were removed and external neurolysis was performed. At 9 months after surgery, he had not regain motor power, thus posterior tibialis tendon transfer was performed to restore ankle dorsiflexion. Finally, at 2 years follow-up, he could ambulate well but did not regained sensation, extensor digitorum communis and peroneal muscle function.

Keywords: *Sciatic nerve injury, Heterotopic ossification, Prominence of the femoral nail*

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Acute, closed, traumatic sciatic nerve injury can occur in a traumatic dislocation of the hip[1], acetabular fractures[2], iatrogenic hip surgery[4], heterotopic ossification (HO) after intramedullary nailing (IM) of a femoral fracture resulting from the patient in the lithotomy position[6]. It has also been reported in uro surgery but, to our knowledge, no reports on sudden nerve injury caused by heterotopic ossification have been published on these patients.

Case Report

A 27-years-old man, a motorcyclist who had a history of a femoral fracture treated by femoral nailing 7 years ago, was the subject. Thereafter, he was grazed by another motorcycle and fell to the ground on his buttocks. His resulting position was with his hip in flexion and externally rotated and knee in a flexed position. When he sat up, he felt a burning pain and numbness below the knee. He noticed that his right leg was weak. Since the accident was minor, he thought it was probably caused by muscle spasms. He received Thai massage therapy from a traditional folk practitioner for one week. Although the burning pain had improved, he still experienced foot drop. And at this point, he went to the hospital. On the physical examination, he showed weakness at tibialis anterior, extensor digitorum, and his peroneus muscle grade was zero (Fig. 4) with impaired sensation from below his knee progressing to the dorsum of his right foot. The x-ray showed that there was a prominence of the femoral nail with heterotopic ossification (Fig. 1, 2). The EMG confirmed that there was sciatic nerve injury at the peroneal area of the hip region. Surgery was performed to remove the nail and explore the condition of the sciatic nerve. It was discovered that there was heterotopic ossification and this was found to be the cause of the nerve displacement. There was a thickening of the epineurium with evidence of injury at the tip of the femoral nail's position (Fig. 3). The femoral nail and the heterotopic ossification were removed and external neurolysis was performed. At ninth month after surgery, the patient did not regained normal motor power. Then, a posterior tiblialis tendon transfer was performed to restore the ankle's dorsiflexion (Fig. 5). At the two year follow-up, he could ambulate well but did not regained sensation. Extensor digitorum communis and peroneal muscle still did not have any function.

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Discussion

HO is a relatively common complication following hip surgery. It has been recorded as a complication of intramedullary nailing, but has not been

Fig. 1 Anteroposterior radiographs showing the heterotopic ossification and prominence of the femoral nail.

Fig. 2 Frog-leg lateral radiographs showing the heterotopic ossification and prominence of the femoral nail.

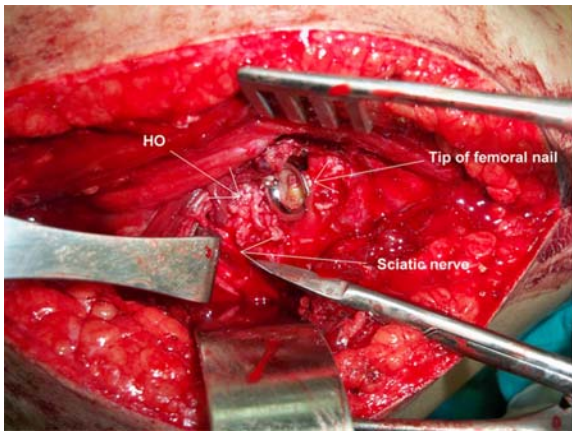

Fig. 3 Heterotopic ossification was found causing nerve displacement. There was a thickening of the epineurium with evidence of injury at the tip of the femoral nail's position.

Fig. 4 Preoperative tibialis posterior tendon transfer on right foot.

mentioned as a significantly relevant problem. The present study of Dodenhof[7] has shown a significant relation between hip pain and heterotopic ossification resulting from femoral nailing. The HO could be a reason for resulting sciatic nerve problems in acute and chronic instances. Reisetein[6] reported on a case of HO following IM nailing with a resulting acute sciatic nerve injury from performing the operation in the lithotomy position and regarding chronic injury, there are two

Fig. 5 Postoperative tibialis posterior tendon transfer on right foot.

reports on record.

In the present case study, the patient had a problem of HO and prominence of the IM nail. He fell on his hip in the position of hip flexion and an external rotation of the hip similar to the position of Reistein's patient[6]. The authors postulated that the presence of HO could possibly compromise the mobility of the nerve, making the nerve vulnerable to injury, especially, in combination with the prominence of the tip of femoral nail. When the hip is in the position of flexion and external rotation, the sciatic nerve could become taut and could be compressed by the HO. In our patient, aside from the HO problem, he also had a problem with a prominence of the tip of the femoral nail. The authors assume that the tip of the femoral nail probably pushed into the sciatic nerve during his fall. This was confirmed by surgical exploration as the thickening of the epineurium was found in the position that was in close proximity to the HO and the tip of the nail. The peroneal portion of the sciatic nerve was injured in the same manner as would be present in an injury following hip trauma.

Although, more than half of the cases in sciatic nerve injury recover within 30 months[5], the injury to our patient is more severe than others previously reported. The authors followed this patient for nine months after removal of the nail, together with surgical excision of the heterotropic ossification and the treatment of external neurolysis. However, he did not regained normal motor function following decompression of the nerve. The absence from work of work was a big problem for an active patient. Then, a tendon transfer was performed to restore the ankle dorsiflexion in regard to the patient's desire to return to work. After two years of follow-up, he was able to use his leg well but the numbness continued and the peroneal muscle function had still not been regained.

Conclusion

The presence of HO after femoral nailing with a prominence of the tip of the femoral nail can cause a sciatic nerve injury. The authors recommend using appropriate femoral nail length and warning the patient of the problem of the possibility of a prominence of the femoral nail. Especially, in a patient with a subsequent HO, and the prominence of the nail should prompt removing of the IM nail as soon as possible after the bony union to prevent this complication.

Potential conflicts of interest

None.

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การบาดเจ็บของเส้นประสาทไซอาติกแบบเฉียบพลันจากการล้มโดยไม่มีบาดแผล ผลจากแกนดามกระดูกนูนบริเวณสะโพกหลังจากผ่าตัดเชื่อมต่อกระดูกที่หักด้วยแกนโลหะดามในโพรงกระดูกต้นขาร่วมกับมีการสร้างกระดูกในกล้ามเนื้อ: รายงานผู้ป่วย 1 ราย

สัญญาณ เนียมปุก, สุคณิศ ฉ่ำชื่น

รายงานผู้ป่วยหนึ่งรายที่มีการบาดเจ็บของเส้นประสาทไซอาติก ซึ่งเกิดจากการกระแทกของแกนโลหะดามในโพรงกระดูกต้นขาที่ยื่นนูนร่วมกับมีกระบวนการสร้างเนื้อกระดูกที่บริเวณสะโพกเหนือจากตำแหน่งโลหะ ดังนั้นจึงควรเลือกขนาดความยาวของแกนดามกระดูกที่ใช้ให้เหมาะสม และหากจำเป็นต้องใส่แกนดามกระดูกที่ยาวนูนขึ้นมาหรือตรวจ พบว่ามีกระบวนการสร้างกระดูกในกล้ามเนื้อบริเวณที่แกนดามกระดูกนูน ควรให้คำแนะนำผู้ป่วยถึงโอกาสที่จะเกิดการบาดเจ็บของเส้นประสาทไซอาติก และควรพิจารณาผ่าตัดเอาแกนดามกระดูกภายในออกหลังจากที่กระดูกต้นขาติดดีแล้ว