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Neurogenic Heterotopic Ossification of the Hip: a Case Report

Neurogenní heterotopická osifikace kyčle: kazuistika

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SUMMARY

Heterotopic ossification (HO) denotes aberrant osteogenesis in extra-skeletal tissues, often associated with neurological disorders, total hip arthroplasty, and specific traumatic scenarios. Neurogenic heterotopic ossification manifests prominently subsequent to traumatic brain injury or spinal cord injury, with Guillain-Barre Syndrome presenting an infrequent etiological link. This article details the case of a 56-year-old female diagnosed with Guillain-Barre Syndrome, who developed neurogenic heterotopic ossification around both hips within two years of disease onset. The patient's medical history included mechanical ventilation, incomplete tetraplegia, and prolonged immobilization. A conclusive diagnosis of HO was established through radiological and clinical assessments. After neurogenic heterotopic ossification was confirmed, the patient had surgery to remove the lesions, radiation therapy, and medication treatments as planned. Physical therapy was introduced one week post-surgery, with subsequent follow-ups tracking improvements in pain levels, range of motion (ROM), and Activities of Daily Living scores.

Key words: neurogenic heterotopic ossification, Guillain-Barre syndrome, hip, excision.

INTRODUCTION

Neurogenic heterotopic ossification (NHO) represents the spontaneous transformation of muscular tissues into endochondral bone. While NHO commonly arises from post-traumatic brain injury (TBI) or spinal cord injury (SCI), it may also manifest as a rare complication of Guillain-Barre Syndrome (GBS) (1). NHO predominantly affects the hip, knee, and shoulder joints, imparting pain and restricting joint mobility. Daily functions such as sitting, ambulation, stair climbing, and activities of daily living may be compromised (2). Even though the exact cause of the disease is still unknown (3), Chauveau et al. (4) wrote in a published article that there were big differences in gene expression patterns between normal bone and heterotopic bone. This study explains how the treatment for a rare case of GBS with bilateral hip neurogenic heterotopic ossification worked.

CASE DESCRIPTION

A 56-year-old female patient diagnosed with GBS came to our outpatient clinic with a decreased bilateral hip range of motion, warmth, and pain around both hips. The patient had no comorbidities other than major depressive disorder and trigeminal neuralgia, which she managed with many medications for the last ten years. The body mass index of the patient was 29. The patient had been intubated and stayed in the intensive care unit (ICU) for two months following her GBS diagnosis. After extubation, she was discharged from the ICU and followed up in the neurology inpatient clinic for apheresis for about six weeks. When neurologic treatments were completed, the patient was transferred to the physical therapy and rehabilitation unit due to a restricted range of motions in both lower extremities, which took physical therapy about six weeks. Despite all the treatments and efforts, the patient could not gain any movement in the hip joints. Both hip joints had no passive range of motion (PROM). Increased pain and warmth around the patient's hips accompanied her restriction of movement. The VAS score was nine, and Barthel's activities on the daily living scale were 25 for the patient.

The patient was referred to our outpatient clinic approximately two years after diagnosis. We ordered plain radiographs, CT, and 3D CT scans, which showed massive HO in both hips (Fig. 1). Surgical removal of the ossifications is planned. The patient is informed about the procedure, major complications, and alternative treatments. After signing consent, surgery was performed (Fig. 2). Although there was minimal serous oozing from the wounds bilaterally in the early postoperative period, wound and blood cultures did not grow any organisms, as the patient did not complain of any fever or other infection signs. We managed that with daily wound care and a one-week course of İV antibiotics, wounds were clean at the end of the sixth day. During this time, the patient was encouraged to perform passive and active range of motion exercises on both hips. After all, the wounds healed, and the patient was immediately referred to the physical therapy unit for

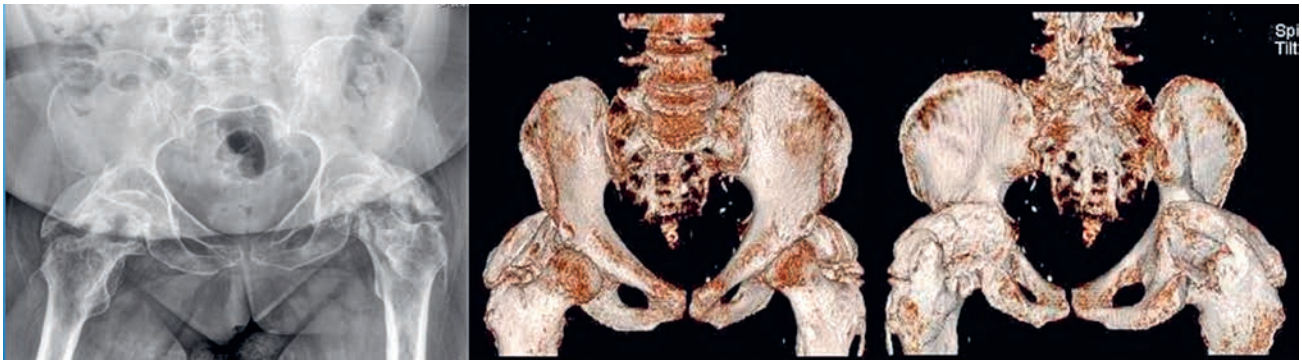

Fig. 1. Preoperative X-ray and 3D CT scans.

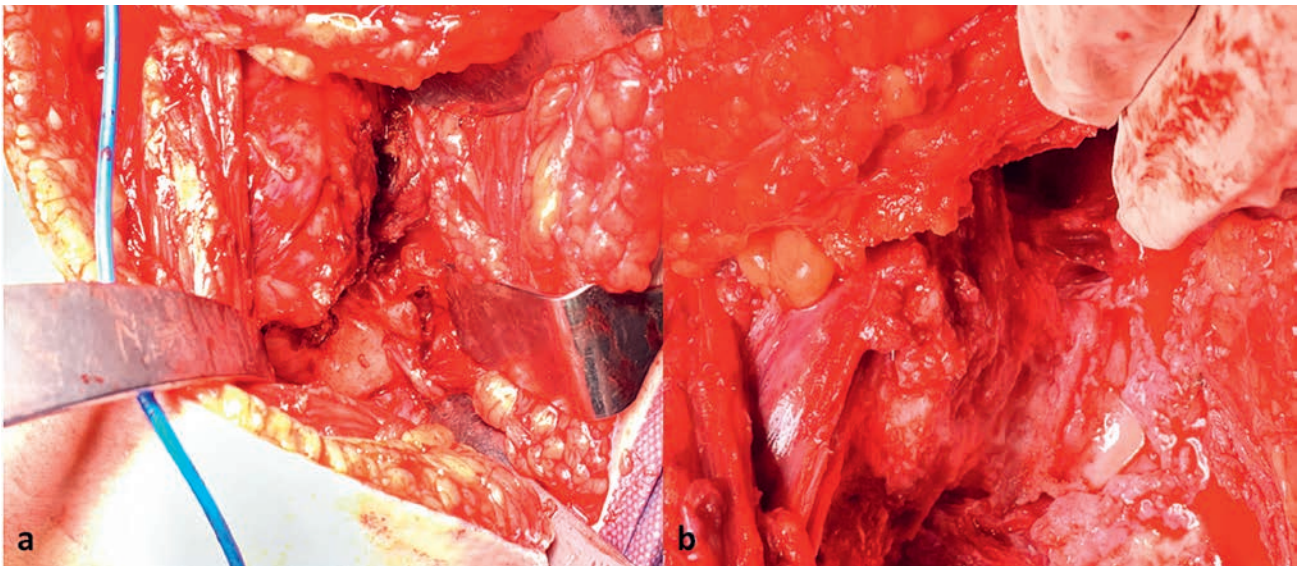

Fig. 2. Intraoperative image of NHO (a), after image of removal of NHO (b).

Fig. 3. Postoperative X-ray image.

ambulation. The patient underwent physical therapy and rehabilitation treatment for about four weeks. The sixth-month control of the PROM of both hip joints was 105° flexion, 15° extension, 30° abduction, 15° adduction, 20° internal rotation, and 35° external rotation. The VAS score was three, and Barthel's activities on the daily living scale were 60 for the patient. The patient was walking with the help of one person and transferring the bed to a chair with minor help.

Surgical technique

Exposure of both hips of the patient was performed using the posterolateral approach. Bluntly dissect the tendinous insertions of the short external rotators. We reached the area where HO was dividing the tendons and joint capsule with a T-shaped with the help of this approach, HO was visualized and removed with an osteotome and high-speed burr (Fig. 3). We were protecting the sciatic nerve during the surgical procedures.

DISCUSSION

Heterotopic ossification commonly occurs after traumatic brain injury (TBI) or spinal cord injury (SCI). Less frequently, it can also develop after total hip replacement surgeries and burn injuries (5, 6). Nevertheless, it is seen as extremely rare after peripheral nerve disorders such as GBS (7).

Many publications have debated heterotrophic ossification and its incidence in neurologic diseases; however, the number of cases of surgical excision of lesions in GBS is limited. So, there is no current guideline for approaching GBS-related NHO cases (8, 9). Recently, de l'Escalopier et al. (5) published their own experiences about treatment in NHO cases of secondary TBI,

SCI, or hip surgery and trauma. They evaluated 377 patients diagnosed with NHO, treated them surgically, and followed them for 16 years. In their experience, they concluded that surgery should be performed as soon as a diagnosis is made. Their mean time to operation is sixteen months after diagnosis. They ordered CT and 3D CT scans for preoperative planning, as we did. The treatment included anti-inflammatory medications and surgical excision. They did not add adjuvant radiotherapy to the regiment since it increases the risk of postoperative infection (5).

Conversely, we added radiotherapy to the process as some authors believed it could decrease the recurrence of the disease (10). Although there was minimal serous oozing from the wounds bilaterally in the early postoperative period, wound and blood cultures did not grow any organisms, as the patient did not complain of any fever or other infection signs. We managed that with daily wound care and a one-week course of İV antibiotics, wounds were clean at the end of the sixth day.

CONCLUSIONS

We concluded that surgical removal of the bilateral hip NHO in patients with GBS was an effective and safe method. Adding radiotherapy to this treatment was unnecessary to prevent a recurrence.

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