# Pain Associated with Heterotopic Ossification: Does It Have a Neurogenic Component as Well?

## To the Editor,

Heterotopic ossification (HO) is the formation of the lamellar bone within the tissues where normally osseous tissue does not exist. Neurogenic HO is a frequent complication after spinal cord injury and traumatic brain injury and it is rarely seen after several neurologic disorders such as stroke, encephalitis, and multiple sclerosis (1). Pain, usually severe, is commonly associated with HO particularly in immature phases. Overall, HO is already a challenging condition, and pain associated with HO can result in a decreased quality of life (2).

Regarding the characteristics of the pain, nociceptive mechanisms already play an important role by insulting the adjacent soft tissues, causing inflammation, and triggering spasticity (2,3). Concerning the etiology of HO, neuropeptides, substance P, calcitonin gene-related peptide, prostaglandins, and bone morphogenic protein can cause some sensory and sympathetic changes within the peripheral nerves. Moreover, Haran et al reported that HO tissue has some nerves (4). From this point of view, a neuropathic mechanism might cause pain in patients with HO. However, to the best of our knowledge, neuropathic pain in HO has not been studied yet. Any sort of nerve entrapments can be another cause of pain in HO.

Non-steroidal anti-inflammatory drugs and bisphosphonates are the mainstay for the medical treatment of HO (5). Although non-steroidal anti-inflammatory drugs are taken in higher doses, pain remains a considerable problem in daily clinical practice. On the other hand, since the patients with HO have a neurologic insult (spinal cord injury, traumatic brain injury) as well, neuropathic pain can be attributed to these neurologic insults. As such, the possible neuropathic pain due to HO can easily be overlooked.

In short, herein we would like to draw attention to the fact that HO might cause neuropathic pain apart from nociceptive pain. However, the literature lacks sufficient data. Therefore, further studies concerning the association of neuropathic pain and morphologic and physiologic characteristics of the nerves in HO are awaited.

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# Severe Pain, Spasticity, and Heterotopic Ossification in a Patient with Spinal Cord Injury: A Vicious Circle and Management with Baclofen Pump

## To the Editor,

A 40-year-old man with complete T8 level spinal cord injury (SCI) was admitted with the complaints of severe pain, spasticity, and limited range of motion in bilateral hip joints at the thirteenth month of injury. Physical examination revealed severe spasticity (Modified Ashworth 3 – 4) in hip flexors and adductors and limited range of motion of the bilateral hip joints. Visual Analog Scale (VAS) for pain was 8/10. Laboratory investigations yielded an increased level of alkaline phosphatase (251 u/L, normal ranges: 38 – 126). Plane radiographs of the pelvis showed severe heterotopic ossification (HO) around the hip joints bilaterally (Fig. 1). Indomethacin 75 mg/d was started for the HO. The patient declared significant impairment in the activities of daily living due to spasticity (e.g., challenges in using intermittent catheterization, sitting, verticalization, and transfers). Since spasticity did not improve with the combination of oral tizanidine hydrochloride, baclofen, and cold pack application; an intrathecal baclofen pump was implanted. The dose of intrathecal baclofen was escalated up to 125 mcg/d. Overall, spasticity and pain improved significantly (Modified Ashworth Scale: 1 – 2 and VAS: 3/10), and the patient was less dependent in his activities of daily living.

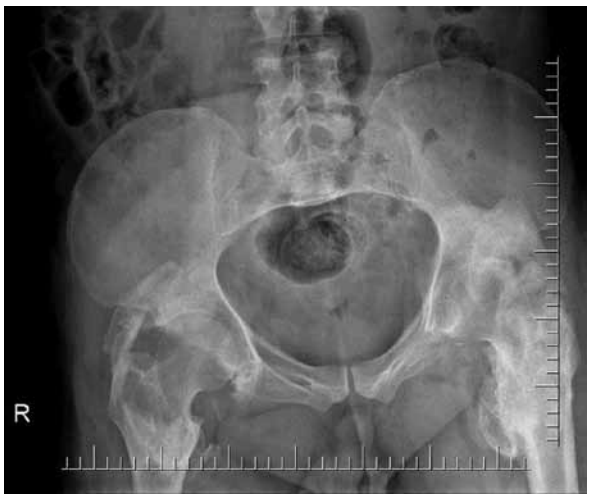


Fig. 1. *Pelvis x-ray designates the heterotopic ossification around hip joints bilaterally.*

HO is the formation of the lamellar bone within tissues where normally osseous tissue does not present. Neurogenic HO is relatively a frequent and challenging complication after SCI which can cause severe pain, limited range of motion, and loss of function. As spasticity has been previously reported as a risk factor for HO formation, HO can trigger spasticity and pain (1). On the other hand, intrathecal baclofen infusion has been reported to be effective in relieving severe spasticity in patients with SCI (2). The subcutaneously implanted pump gives baclofen by a catheter to the lumbar subarachnoid space. Since only a small portion of oral baclofen goes to the spinal fluid, an intrathecal baclofen system can be more effective with less doses taken than oral doses with some advantages: fewer and less side effects compared with oral medicine and individually adjustable infusion rates during the day according to spasticity level. By contrast, infection, catheter and pump dysfunction, nausea, dizziness, headaches, and weakness with higher doses can be seen as the side effects of intratechal baclofen pumps (2,3). In conclusion, herein presenting this challenging case we would like to underscore the role of intratechal baclofen pump, keeping in mind the complications, in the management of spasticity and pain due to HO in patients with SCI.

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