Heterotopic Ossification (HO)

What is Heterotopic Ossification (HO)?

- Heterotopic ossification (HO) is unusual bone growth outside of the skeleton. HO is usually found in the soft tissues, such as muscle, around large joints that are below the injury level. It can be found on one or both sides of the body, in areas that do not typically have bone.
- HO starts to form as a soft mass that becomes calcified over time into true bone.
- HO is usually diagnosed between one and six months after SCI, rarely later.
- The most commonly affected joints are the front and inside of the hip area, followed by the inside of the knee. In people with tetraplegia, it may also be found around the shoulder or elbow joints.
- The reason HO forms after SCI is unclear.

What are signs and symptoms of HO?

- Warmth, redness, or swelling around a large joint
- Pain
- Unexplained fever, autonomic dysreflexia or worsening spasticity
- Loss of joint flexibility (range of motion), which can cause difficulty with moving into a seated position, a lopsided sitting posture, or difficulty bending the hip for dressing and transfers.
- Loss of function such as strength or feeling, due to the bone pressing on a nerve (rare)
- Blood clot due to the bone pressing on a blood vessel (rare)

How is HO diagnosed?

- A triple phase bone scan is a very sensitive radiology test that can detect early HO.
- A plain X-ray can show HO, but not as early as a triple phase bone scan.
- Bloodwork may show some lab abnormalities (elevated alkaline phosphatase, ESR, CRP), but these abnormalities are not specific to HO, and may be present in several other conditions.

What is the treatment for HO?

- Medications:
  - Etidronate is a drug taken by mouth that may temporarily halt the maturation of the HO. It is used only for a maximum of 6 months due to the risk for developing Paget's disease.
  - Non-steroidal anti-inflammatory medications (indomethacin is the best studied) may be used to decrease the inflammation that comes with HO.
- Gentle range of motion helps to prevent loss of flexibility.
- Surgery for HO carries a high risk of complications such as dangerous blood loss and infection. Because of this, surgery to remove all or part of the HO is only recommended in cases where it severely affects function. The surgery should be performed by an experienced surgeon, and ideally when the bone has already fully matured. Most people with HO after SCI will not need surgery.
- Prevention: Although studies on HO are being conducted, there is currently no widely recommended or used medication protocol to effectively prevent formation of HO.

Resource for patients:

Burns, SP and Hammond, MC, eds. (2009). *Yes You Can! A guide to self-care for persons with spinal cord injury*, 4th ed. Washington, D.C.: Paralyzed Veterans of America. Retrieved from: http://www.pva.org

Resource for health care providers:

Teasell RW, Mehta S, Aubut JL, Ashe MC, Sequeira K, et. al. (2010). *A Systematic Review of the Therapeutic Interventions for Heterotopic Ossification After Spinal Cord Injury.* Spinal Cord 48: 512-521.

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