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Painful Proximal Oriented Large Heterotopic Spur Formation in an Active Adult Non-Traumatic Amputee

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Abstract

Heterotopic ossification (HO) is excess bone growth in soft tissues. Typically juxta-articular and interfascicular, with varying incidence, HO has been well documented in traumatic amputees but less frequently observed in the non-traumatic amputee population. Symptomatic HO usually includes pain during prosthetic use, with management involving prosthetic adjustments for comfort. This atypical case highlights a non-traumatic amputee developing proximal oriented large spur formation that was painful not with ambulation but with doffing of his prosthesis.

Case Description

A 58 year old gentleman with a history of atrial fibrillation on coumadin and peripheral vascular disease presented to an emergency room in Italy in June 2015 with shortness of breath. The patient was in acute respiratory failure requiring intubation and mechanical ventilation and prolonged vasopressor support for septic shock. He required 15 days of extracorporeal membrane oxygenation (ECMO) and was in acute respiratory failure requiring intubation and mechanical ventilation and prolonged vasopressor support for septic shock.

The patient had pre-injury prosthetic training in September 2015 and inpatient prosthetic training in February 2016, demonstrating proficiency and independence in ambulation and activities of daily living with his prosthesis. At that time, he did not have any atypical pain, nor was there any evidence of heterotopic ossification.

The patient was highly active with his tight fitting prostheses. However, he began to complain of severe pain in the left residual limb, not with weight bearing, but only when he removed his residual limb from his socket. Upon his follow up appointment with his physiatrist, an X-ray was ordered which revealed a 3.9 x 2.3 cm calcified lesion at the medial aspect of the femoral shaft of his residual left femur. This heterotopic spur was oriented proximally. He was referred to plastic surgery, who removed the spur and noted that the spur had a significant blood supply. Post-operatively, the patient was pain free and continued to be active with his prosthesis.

Discussion

The pathophysiology of HO is not very well described in the literature. It is thought to be due to the transformation of dormant osteoprogenitor stem cells into osteoblasts, leading to bone formation [3]. Various humoral, neural, and local factors must come together to create the necessary environment for HO to occur [7]. When the peristeum covering bone that is retained is stripped, ectopic bone formation can occur [8]. This results in the formation of a simple bone spur. However, what makes this case unique is the extension of the bony growth into adjacent soft tissue as well as its irregular shape. An extensive literature review revealed only one case report of heterotopic ossification in the residual lower limb in an adult non-traumatic amputee [9]. To our knowledge, heterotopic ossification in an adult non-traumatic amputee is a rare occurrence.

In the particular presentation of pain with donning of the prosthesis along with his proximal orientation of his heterotopic spur, appear to be unique. Dudek et al. [5] described two separate case reports of patients with HO that caused significant residual limb pain post-amputation. The first was a 39 year-old woman who had a left transfemoral amputation after a traumatic event. Radiologic examination at 6 months post-amputation revealed a bone growth along the femoral shaft extending from the amputation site to adjacent soft tissues. Release of the sciatic nerve as well as adjustments to her prosthetic socket were not helpful in relieving the magnitude of her limb pain. Surgical excision was performed 18 months after amputation with significant relief of her pain along with an improved functional use of the prosthesis. The second was a 59-year-old man who also underwent a left transfemoral amputation after a traumatic injury. His radiograph revealed bony spurring at the distal end of the femur as well as bony formation in adjacent soft tissues. The patient was limited in movement as weight-bearing on the amputated limb caused him pain. His radiograph revealed a new prostatic socket provided pressure relief at the distal lateral femur. Kömürçü et al. [10] described a 35 year-old man who also had a transfemoral amputation following a traumatic injury. Sonographic as well as radiographic imaging of the right knee revealed a bony spur on the tibia. There was no mention of management of this patient’s condition as the report only focused on diagnosis of the condition. Subsequently, HO was described as a nonsteroidal anti-inflammatory drugs and bisphosphonates are used to manage progression, requiring a right transfemoral amputation following a traumatic event.

In addition, the patient’s presentation of pain with doffing of the prosthesis, heterotopic osteoarthritis in an adult non-traumatic amputee appears to be unique. The second was a 59 year-old man who also underwent a left transfemoral amputation after a traumatic injury. His radiograph revealed bony spurring at the distal end of the femur as well as bony formation in adjacent soft tissues. The patient was limited in movement as weight-bearing on the amputated limb caused him pain. His radiograph revealed a new prostatic socket provided pressure relief at the distal lateral femur. Kömürçü et al. [10] described a 35 year-old man who also had a transfemoral amputation following a traumatic injury. Sonographic as well as radiographic imaging of the right knee revealed a bony spur on the tibia. There was no mention of management of this patient’s condition as the report only focused on diagnosis of the condition.

Heterotopic Ossification

Heterotopic ossification (HO) is excess bone growth in soft tissues. Typically it develops outside the borders of normal periosteum and has its own vascular supply [1]. It can be contiguous with the periosteum of the residual limb. Typically HO is not painful or causing pain and irritation [2]. If not well covered by the soft tissues, it may be contiguous with the residual limb.

References