

## Heterotrophic Ossification And Outcome Of Physical Therapy - A Case Study

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### ABSTRACT

Outcome of physiotherapy after heterotrophic ossification (HO) formation remains challenging and unsatisfactory. We report such a case who instead shows remarkable improvement in range of motion (ROM) after physiotherapy. A 21 year old gentleman sustained closed cervical spine fracture complicated with neurological deficit. He underwent posterior instrumentation and was on rehabilitation post operatively. ROM of bilateral hip was still limited despite remarkable neurological improvement after 8 months. It was then incidentally noted heterotrophic ossification formation over the bilateral hip. Patient was put under physiotherapy session to increase bilateral hip ROM and 4 months later patient was able to stand and ambulate without pain. We present this case for its rarity in term of ROM outcome after such a massive HO formation at joint region.

Key words: heterotrophic ossification, range of motion, hip, cervical spine fracture, physiotherapy.

### INTRODUCTION

The incidence of heterotrophic ossification (HO) following spinal cord injury is between 16% to 53%. The most common site is at the hip (70%-97%)<sup>5</sup>. We report a rare case of outcome of Heterotrophic ossification following physical therapy. The challenges in diagnosis and other option treatment are discussed.

### CASE REPORT

A 21 year old gentleman sustained closed C5-C7 burst fracture with T1 lamina fracture complicated with neurological deficit and spinal shock (fig 1 and 2). Upon presentation there was neurological deficit from T1 level and below. Patient later underwent emergency posterior instrumentation on C4 until T1 (fig 3) level however patient did not show any immediate neurological recovery post operatively. Patient was then referred to rehabilitation unit to reduce patient dependency and improve the quality of life. 8 months post operatively patient

neurological condition gradually improves with both upper and lower limb muscle power recovered fully. However patient still unable to ambulate because of pain and reduced ROM over the bilateral hip despite improvement in neurological function. Bilateral hip mass over the bilateral hip was incidentally found out during regular orthopedic clinic follow up. Xray of the hip reveals extensive calcification at bilateral hip region with mature HO formation (fig 5). Patient was then put under numerous session of physical therapy in order to increase bilateral hip ROM and 4 months later patient able stand and ambulate without pain (fig 6).

### DISCUSSION

HO is thought to be associated with local inflammation which affects mesenchymal stem cells present in soft tissues. These mesenchymal cells transform into osteoblasts which are regulated by prostaglandins. Inflammation releases prostaglandins, particularly prostaglandin E<sub>2</sub>, which has been found to lead to lamellar heterotopic bone formation in experimental animal studies. The use of physical therapy in heterotrophic ossification has long been controversial compared to other treatment method of heterotrophic ossification. Study done by Rossier in 1973 noted occasional transverse microfractures on sections of heterotrophic ossification that they thought might be caused by aggressive passive range of motion (PROM)<sup>1</sup>. Since then, the debate between resting the joint and aggressive PROM has continued. The treatment of heterotrophic ossification is challenging and many cases shows unsatisfactory result. Based on several studies it was concluded that the major goal of physical therapy is to maintain ROM and to preserve the remaining function. Other modalities of Heterotrophic ossification such as surgical intervention, radiotherapy and NSAID are often the preferable treatment option. A study conducted in 1986 concluded that patient with risk of developing HO that was managed with beyond pain free PROM progressed to