Extracorporeal Shockwave Therapy for Painful Chronic Traumatic Heterotopic Ossification after Right Acetabulum Fracture Fixation: A Case Report and Literature Review

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Abstract

BACKGROUND: Heterotopic ossification (HO) usually occurs in trauma, such as fractures. To the best of our knowledge, there is a lack of studies about the effects of shockwave on the size of HO in the literature.

AIM: The aim of this study was to describe the effects of extracorporeal shockwave therapy (ESWT) on the size of HO as well as the lower extremity functions in patients with fracture right acetabulum.

CASE REPORT: A 36-year-old gentleman had a traffic accident on August 30, 2015, resulted in a fracture of the right acetabulum and fracture left clavicle. Fracture right acetabulum treated by open reduction and internal fixation on September 2, 2015. The patient has complained of severe right hip pain with limitation of daily activities, especially walking, standing, and sitting, visual analog scale about 7-8/10 with painful and restricted ROM of the right hip. Plain X-ray of the right hip revealed HO at greater trochanter with a long axis length 37.3 mm. ESWT was applied for HO. ESWT was administered 6 times each weekly for 6 weeks. At 6-month follow-up, the size of HO had become slightly smaller with the improvement of pain, and lower extremities functions.

CONCLUSION: ESWT is a novel non-invasive and safe treatment for HO. The effects of ESWT on the size of HO had become slightly smaller with the improvement of lower extremities functions.

Introduction

Heterotopic ossification (HO) is defined as bone formation in non-osseous tissues. HO usually occurs in trauma such as fractures and surgical procedures of the hip. Traumatic HO occurs in 10–20 % of predisposed patients [1]. Extracorporeal shockwave therapy (ESWT) generates pressure waves through the collision of solid bodies [2]. It has been widely used to treat various musculoskeletal injuries [3, 4].

To the best of our knowledge, few reports have been reported about the effects of ESWT on the size of HO as well as functions of the lower extremity in the literature. Thus, the objective is to describe the effects of ESWT on the size of HO as well as the lower extremity functions in patients with fracture right acetabulum. Thus, the objective is to describe the effects of ESWT on the size of HO as well as the lower extremity functions in patients with fracture right acetabulum.

Case Presentation

A 36-year-old male with no notable medical history had been involved in a traffic accident on August 30, 2015, resulted in fracture right acetabulum and fracture left clavicle. Fracture right acetabulum treated by open reduction and internal fixation on September 2, 2015. Fracture left clavicle treated conservatively.

The patient came to the physical medicine and rehabilitation department at Al Razi hospital in Kuwait referred from orthopedic doctor complaining of severe right hip pain which affects his ADL activities, especially walking, standing, and sitting. Clinically, his visual analog scale was 7-8/10 with a painful limited range of motion (ROM) of the right hip. Passive ROM of the left hip was restrictively measured using a goniometer in a supine position due to pain.

Plain X-ray of the right hip was done and revealed HO at greater trochanter and femoral head with long axis length for greater trochanter HO 37.3 mm.
ESWT was applied using Piezo shockwave (Richard Wolf, century, Germany) for the right hip HO because conservative treatments were ineffective. Each application of ESWT used 3000 shocks at the rate of 5 Hz and the energy flux density between 0.064 and 0.139 mJ/mm$^2$ (intensity 10~18) and ESWT was administered 6 times each weekly. During the 6 weeks of the treatment period, the subject tolerated ESWT treatments, and no serious side effects were observed.

![Figure 1: (a) Radiograph of the right hip showed before extracorporeal shockwave therapy (ESWT). (b) Radiograph of the right hip showed after ESWT. The size of the heterotopic ossification had become slightly smaller](image)

At 5-month follow-up, he got an improvement of his daily activities, especially walking and sitting, reduction of pain with visual analog scale about 1/10 and increased ROM of right hip (Table 1).

| Clinical outcome | Before ESWT | After 3 weeks of ESWT | After 6 weeks of ESWT | After 6 months |
|------------------|-------------|-----------------------|----------------------|---------------|
| VAS              | 7–8         | 3                     | 2                    | 0             |
| Functional activity | 4          | 3                     | 2                    | 1             |
| ROM              | 80          | 90                    | 90                   | 100           |
| Flexion          | 15          | 20                    | 30                   | 30            |
| Abduction        | 10          | 15                    | 15                   | 20            |
| Internal rotation| 15          | 20                    | 20                   | 30            |
| External rotation| 0           | 5                     | 5                    | 5             |

Moreover, we found that the effects of ESWT on the size of HO had become slightly smaller in our patient with the improvement of pain, ROM, muscle strength, and lower extremities functions (Table 1 and Figure 1).

**Discussion**

HO is defined as bone formation in non-osseous tissues. HO usually occurs in trauma such as fractures and surgical procedures of the hip. Traumatic HO occurs in 10–20% of predisposed patients [1]. Traumatic HO causes significant morbidity, including pain and loss of motion, especially around joints and can significantly impair quality of life. Therefore, it seems desirable to find ways of either preventing or treating this pathological process for improved rehabilitation [1].

ESWT is a novel non-invasive and safe treatment for reducing pain resulting from traumatic HO in patients with fracture right acetabulum. The effects of ESWT on the size of HO had become slightly smaller with the improvement of pain, ROM, muscle strength, and lower extremities functions of the patient. Moreover, ESWT might be an interesting treatment for traumatic HO and can be a complement to usual medical treatment, physiotherapy, and before surgery.

**Consent for Publication**

Oral informed consent was obtained from the patient for publication of this case report and any accompanying images.
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