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Clay-Shoveler Fracture in a Golfer: A Rare Sports Injury Case Report

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Abstract

Clay-shoveler's fracture is a relatively rare stress-type avulsion fracture of the lower cervical or upper thoracic spinous processes, most commonly occurring at C7 and T1. The term of this injury comes from its historical association with manual laborers who lifted and threw big objects, as well as with scooping huge loads of clay in the early 20th centuryThe case report describes A 29 year old male experienced severe back pain after playing golf. at the time of the golf swing, the golf swing did not hit the ball but hit the ground. the patient experienced radiculopathy pain to both hands. A "pop" sound was audible in the spine at the moment of the hitting fault, and there was no paralysis in the lower limbs.The primary method for managing a clay-shoveler fracture is conservative. In most cases, traction of the rhomboid and trapezius muscles on the spinous process leads to nonunion. In rare cases if the pain persists, surgically removing the bone fragment may be a possibility.

Introduction

Clay-shoveler's fracture is a relatively rare stress-type avulsion fracture of the lower cervical or upper thoracic spinous processes, most commonly occurring at C7 and T1. The term of this injury comes from its historical association with manual laborers who lifted and threw big objects, as well as with scooping huge loads of clay in the early 20th century (de Boer et al., 2016) . At the moment, this has been mentioned in relation to a number of sports, including football, golf, and powerlifting (de Boer et al., 2016; Kim et al., 2012). The majority of treatment involves immobilization, the use of a support device, and the administration of painkillers. On the other hand, in situations when there is excruciating, ongoing pain linked to non-union and delayed union, surgery may be recommended (Murphy & Hedequist, 2015). In this article, we present clay shovel fractures of T1, T2 in amateur golfers.

Case Presentation

A 29 year old male experienced severe back pain after playing golf. at the time of the golf swing, the golf swing did not hit the ball but hit the ground. the patient experienced radiculopathy pain to both hands. A "pop" sound was audible in the spine at the moment of the hitting fault, and there was no paralysis in the lower limbs. He has no medical history including musculoskeletal disorders such as osteoporosis On physical examination, there was tenderness when pressing on the thoracal spine. Computed tomography revealed displaced fractures in the spinous processes of vertebrae T1 and T2 (Fig.1). Magnetic resonance imaging (MRI) scan showed soft tissue edema surrounding the fracture site (Fig.2). The patient received oral analgesics as needed and used a Thoracal orthosis for 6 weeks. Following this accident, he was told not to indulge in activities that were strenuous. pain radiating to both hands slowly

decreased in the second week and the pain was no longer felt in the fourth week. In the sixth week, there was no pain in the spine. 3 months after the incident, the patient was able to play golf again and no pain was felt.

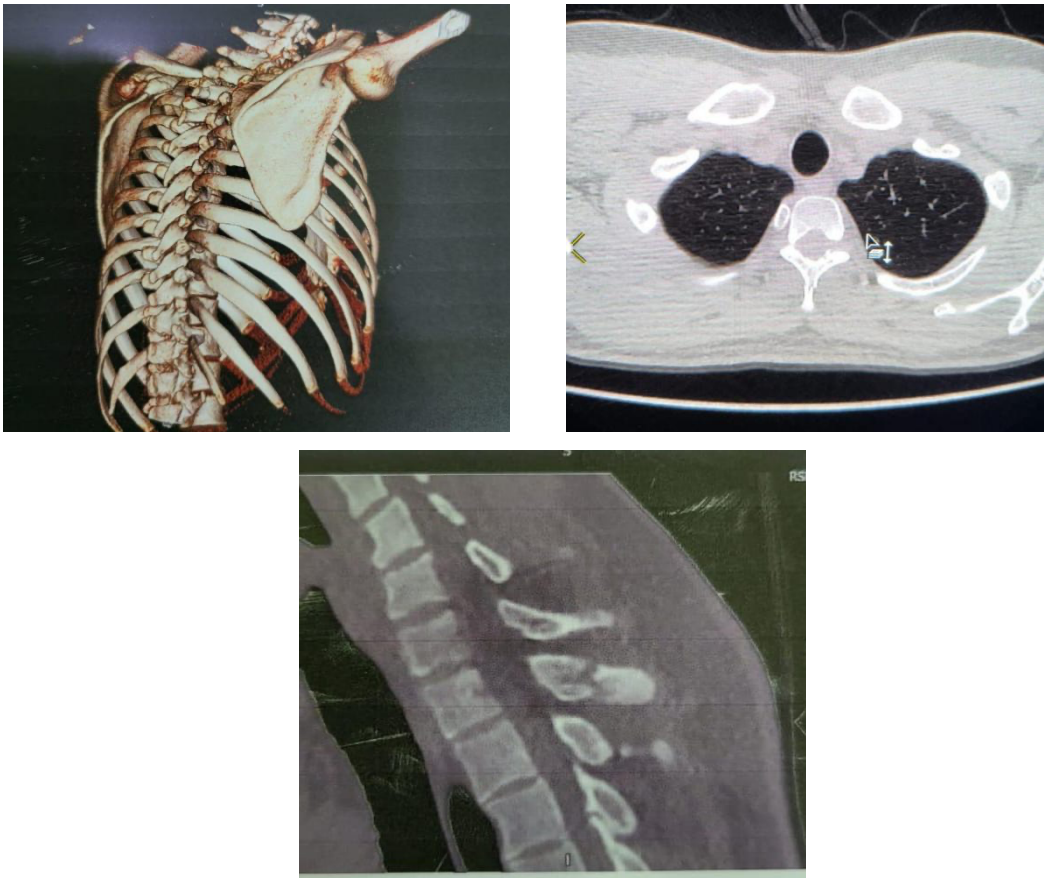

Figure 1. Computed Tomography Revealed Displaced Fractures in the Spinous Processes of Vertebrae T1 and T2

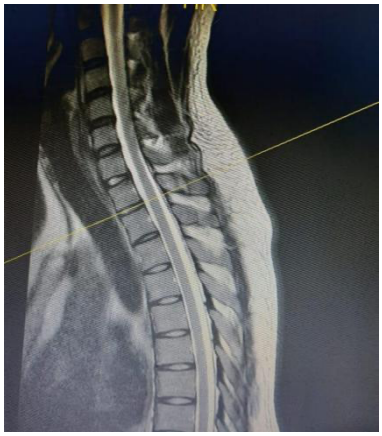

Figure 2. Magnetic Resonance Imaging (MRI) Scan Showed Soft Tissue Edema Surrounding the Fracture Site

Discussion

It is believed that the first reports of spinous process fractures in laborers following repeated pulling of the upper back muscles date back to approximately 1875 (Venable et al., 1964; CANCELMO, 1972). According to his description, the fractures usually happen when the shovel becomes stuck with clay during throwing or when an impediment abruptly stops the shovel, which both cause the shovel to suddenly slow down and tug on the spinous processes in the back muscles (Hall, 1940). This is still possible in modern times in the game of golf. To

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effectively transfer the power produced by the swing, a synchronized series of whole-body muscle activation is needed (McHardy & Pollard, 2005).

Golfers have various musculoskeletal disorders or golf swing-related fractures, including stress fractures caused by repeated bone shocks and fractures caused by rapid twisting (Gluck et al., 2008; McHardy et al., 2006). Golf-related injuries can occur from overuse or damage and typically impact the elbow, wrist,neck,shoulder, and lower back. Stress fractures result from repeated loading that damages bone more than it can heal. These fractures happen when the region over which the force is applied decreases, the individual load increases, or the number of repetitions increases (Knapp & Garrett, 1997).

The trapezius and rhomboid muscles, which are linked to spinous processes in the upper back and neck, are believed to be the primary source of shearing pressures that cause this injury (de Boer et al., 2016). In our instance, the damage was likewise caused by the trapezius muscle. The external occipital protuberance of the occipital bone, the medial one-third of the superior nuchal line, the seventh cervical and all thoracic verbetrae spines, and the intervening supraspinal ligament are the origins of the trapezius muscle (McHardy & Pollard, 2005). In conjunction with other muscles, it helps to suspend the shoulder girdle. It is rather thin and flat, but in the upper thoracic and lower cervical regions, it thickens. Where a noticeable diamond-shaped buildup of tendinous fibers of origin corresponds to its increased thickness (McHardy & Pollard, 2005). In comparison to the upper cervical region, the lower cervical region has a comparatively longer spinous process. Its strands come together in the direction of the shoulder bones (McHardy & Pollard, 2005). The right upper and middle trapezius muscles contract during the back swing. The left middle trapezius muscle tightens during the forward swing. Thus, we can hypothesize that a muscular contraction makes a bow-like movement from the right to the left. The force may be increased during the acceleration phase due to the pectoralis muscle (McHardy & Pollard, 2005). The energy built up during the back swing cannot be transferred to the ball when a right-handed golfer swings such that the club makes contact with the ground before the ball. The contraction of the right upper and middle trapezius muscle abruptly shifts to its attachment point, the spinous process. A spinous process fracture could occur if the trapezius tendon is subjected to sufficient force (McHardy & Pollard, 2005).

The primary approach to managing a clay-shoveler fracture is mostly conservative (Sayari et al., 2021; Brown & McKenna, 2009). A support device is often used during immobilization, and analgesic medication is taken for 4-6 weeks as part of a conservative treatment plan.in most cases patients can walk again and have no complaints after 4 months (de Boer et al., 2016; Kim et al., 2012). If conservative treatment fails, surgery to remove bone fragments may be an option (Lenza et al., 2019; Prost et al., 2021; Brown & McKenna, 2009) . In our patient was given analgesic therapy for 6 weeks and the use of thoracal orthosis on the spine. After the sixth week the patient had no pain and stopped the use of analgesic drugs. the patient played golf after 3 months of injury and did not have any pain.

Conclusion

Clay-shoveler's fracture is a relatively rare stress-type avulsion fracture of the lower cervical or upper thoracic spinous processes. This has been reported in reference to several sports, including football, golf, and powerlifting.The trapezius and rhomboid muscles, which are connected to spinous processes in the upper back and neck, are thought to be the primary source of shearing pressures that produce this injury. The primary method for managing a clay-shoveler fracture is conservative. In most cases, traction of the rhomboid and trapezius muscles on the spinous process leads to nonunion. In rare cases if the pain persists, surgically removing the bone fragment may be a possibility.

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