



# An Uncommon Mechanism of Work-Related Partial-Thickness Triceps Tear

**Urgent message:** Triceps tears are an uncommon acute injury that can occur from multiple mechanisms, including direct trauma. Assessment of these injuries requires obtaining a medical history and exam and a knowledge of characteristic diagnostic imaging findings. Early diagnosis and identification in patients presenting to an urgent care center is critical to ensure that appropriate treatment is initiated in a timely fashion.

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## Introduction

Triceps tendon (TT) tear is the least common of all tendon injuries and comprises <1% of all upper extremity injuries.<sup>1</sup> Partial tears of the TT typically affect the distal tendon.<sup>2</sup> The commonly accepted mechanism of injury for triceps tear is an active overloaded contraction of an extended triceps muscle.<sup>1</sup> Injuries may also occur from lacerations, adrenergic steroid injection, volleyball serving, hammering, and weight lifting.<sup>1,3</sup> An uncommon mechanism of triceps tear is a direct impact injury to the posterior elbow; thus, this type of injury may be less commonly considered as a diagnosis in these instances.<sup>4</sup> Plain film findings, such as the so-called “flake sign,” may be helpful in the diagnosis of these injuries.<sup>2</sup> As clinical outcomes may vary relative to the time from injury to repair, early diagnosis and treatment are important for restoring full function.<sup>5</sup>

## Case Report

A 59-year-old male with no history of elbow injuries was working as a welder for the local parks and recreation department. On the date of injury, he tripped over cables at work and fell, striking the posterior aspect of his dominant elbow against the hard edge of a metal tabletop. He had immediate discomfort of the posterior

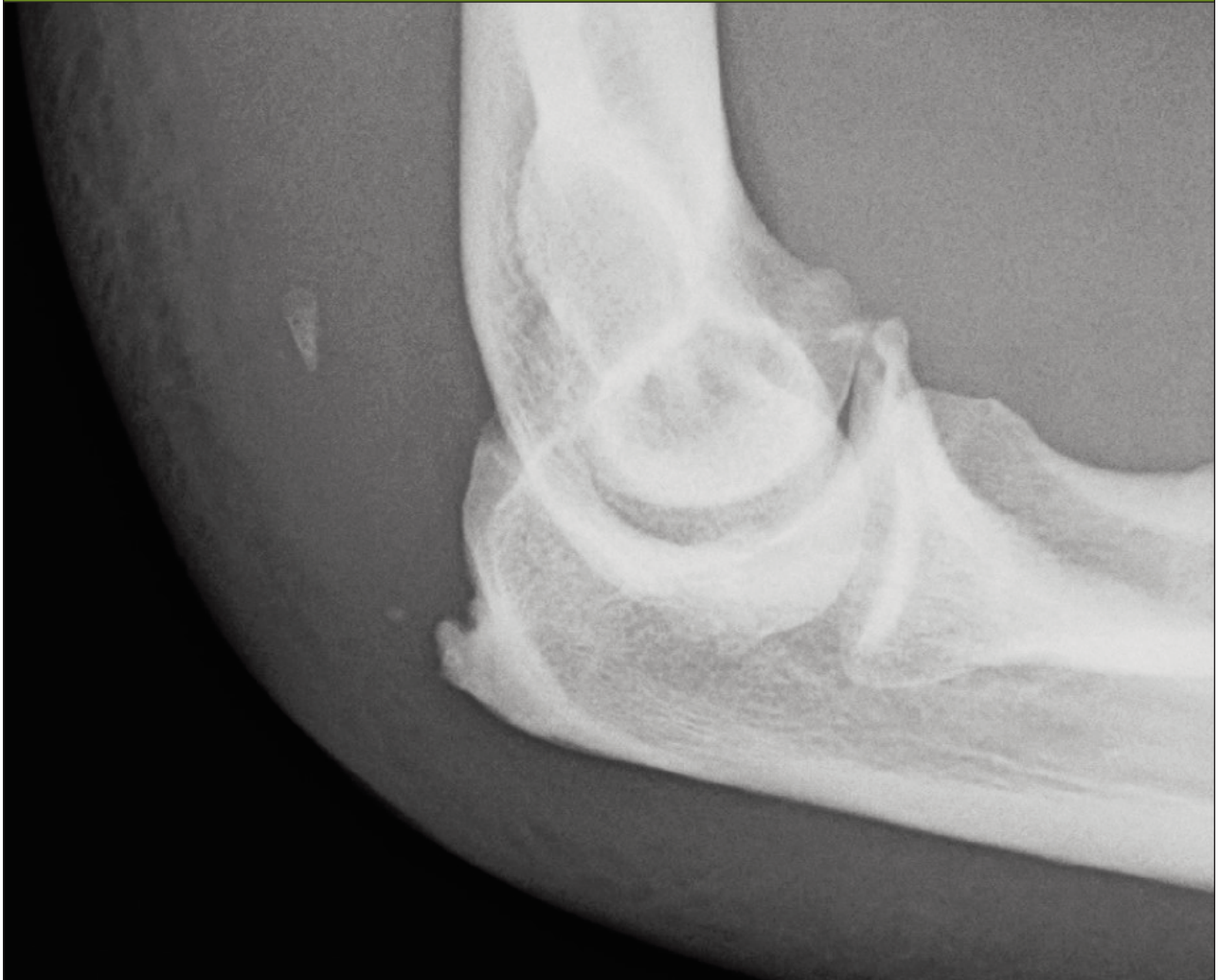


elbow, but was able to move the elbow with pain.

The initial clinical examination on the date of injury revealed swelling and tenderness of the posterior aspect

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Figure 1.



of the elbow. Range of motion was limited to 10° of decreased extension and 90° of flexion, compared with 0° at full extension and no hyperextension of the uninjured elbow. The radial head and biceps insertion were nontender. The remainder of the upper arm and shoulder examination were unremarkable. Four-view (anterior-posterior [AP], lateral, oblique, and radial head) plain films of the elbow and two-view (AP, lateral) plain films of the humerus were performed. The radiology report of the elbow x-ray (**Figure 1**) on the date of injury was negative for fracture or dislocation, but noted mild degenerative arthritis. Additional findings included mild soft tissue swelling, a hypertrophic spur along the posterior aspect of the elbow, and two small corticated bony densities posterior to the distal humerus. There was no

evidence of acute bony avulsion at the TT insertion.

The initial presentation of the injury was felt to be most consistent with a posterior elbow contusion. The initial treatment was conservative, consisting of home range-of-motion exercises, ice, elevation, an over-the-counter nonsteroidal anti-inflammatory medication, and a sling for comfort. A physical therapy referral was placed in follow-up 4 weeks after the injury occurred.

Due to persistent pain, a magnetic resonance image (MRI) was ordered at the seventh follow-up visit. An MRI study nearly 3 months status postinjury demonstrated a high-grade partial tear involving approximately 30% to 40% of the distal TT accompanied by mild atrophy of the triceps musculature. Based on this finding, the patient was referred to an orthopedic surgeon for further

evaluation. The TT was surgically repaired 3.5 months following the original injury. During surgery, the superficial 50% of the triceps muscle was noted to be retracted several centimeters from its distal insertion. The TT was sutured to an anchor placed over the posterior cortex of the posterior ulna, and the procedure was accomplished without complications.

Fourteen weeks postoperatively (7 months after the original date of injury), he was released back to work without restrictions.

### Discussion

This case demonstrates a unique mechanism of TT injury from a direct traumatic impact to the posterior elbow rather than from an excessive contraction of a flexed triceps muscle. This mechanism has not been reported frequently in the literature.<sup>1,4,6</sup> It is important to maintain clinical suspicion if a likely contusion or strain injury fails to respond within the normal period of expected healing. Elaborative imaging studies will include baseline radiographs and musculoskeletal ultrasonography or MRI. Plain film signs of a distal TT tear include excessive soft tissue swelling or hematoma, avulsed bone from the olecranon process, a posterior fat pad (ie, “sail” sign), or a fluid-filled defect where the TT has retracted.<sup>2</sup> The finding of an avulsed bone fragment on x-ray is commonly described as a “flake” or “fleck” sign; this may appear as a triangulated radiopaque density posterior to the elbow on lateral view measuring 0.4–1.9 cm in length and typically retracted at least 2.4 cm proximal from the olecranon.<sup>2,7</sup>

Surgical repair for incomplete or partial tendon tears is controversial, since nonsurgical treatment is often effective in treating partial tears.<sup>3,5,6</sup> Nonsurgical treatment may range from no intervention to restrictions of 4–6 weeks in an extension splint.<sup>1,5</sup> Nonsurgical treatment may be ineffective in individuals who routinely extend weight above their heads, such as some workers, children,

*“Early diagnosis of triceps tears is critical to ensure that appropriate treatment is initiated in a timely fashion to minimize prolonged impairment.”*

and some athletes.<sup>5</sup> Chronic TT injuries may require autograft reconstruction using the palmaris longus tendon or other reconstructive procedures.<sup>8</sup> The possibility of less-than-favorable outcome increases with delayed diagnosis and underscores the importance of an appropriate treatment algorithm.

In this case, the patient’s work demands resulted in ongoing pain and a failure to respond to conservative management. The determination of which patients may require

surgical intervention suggests that collaborative management between the occupational or treating physician, the orthopedic surgeon, and the physical therapist should begin early in such injuries.

### Key Points

- Direct trauma to the triceps tendon is an uncommon mechanism for triceps tears and is reported infrequently in current literature.
- Surgical intervention may be necessary for partial triceps tears in patients who have persistent pain or who fail to respond to conservative management.
- Early diagnosis and identification of triceps tears are critical to ensure that appropriate treatment is initiated in a timely fashion to minimize prolonged impairment.

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