

# High-Pressure Water Injection Causing an Isolated Tendon Laceration: A Case Report

John C. Austin, MD, and Fred M. Hankin, MD

**H**igh-pressure injection of water frequently elicits a minimal inflammatory response. However, the mechanical force of the stream can cause significant soft-tissue injuries, including tendon lacerations.

## CASE REPORT

A 43-year-old man using a pressure washer to clean the aluminum siding on his home was using well water as the final rinse. No chemicals were added to the tank. The 6.5-hp (4.85-kW) engine of his pressure washer can move 3 gal (11.4 L) of water per minute and generate a water pressure of 17 MPa, or 2500 psi. A nozzle creating a fine, flat, fan spray and a pressure of 2300 psi (16 MPa) had been selected.

During the patient's descent from the ladder, the spray wand held in the patient's right hand was inadvertently brought across the dorsum of his left, nondominant hand. The point of contact was at the anatomic snuff box, and pressurized water was injected into his forearm through this portal.

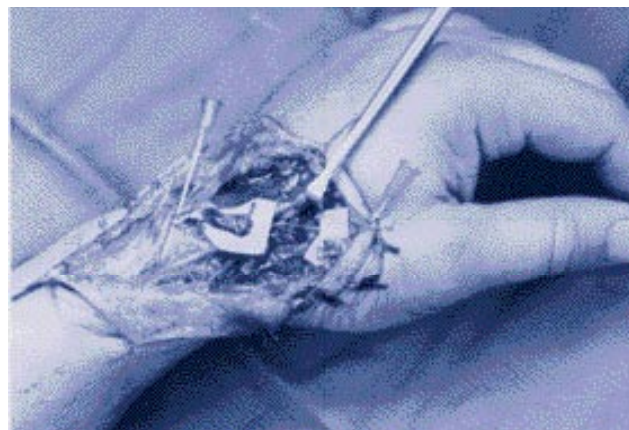
The initial evaluation in an emergency room focused on the fluid extravasation in the forearm. No evidence of compartment syndrome was found, and after a period of observation, the patient was discharged home. He was referred to our office and was seen 2 days following the injury.

The examination in our office was unremarkable with the exception of what appeared to be a superficial, 1-cm wound over the anatomic snuff box (Figure 1), diminished sensation distal to this wound, and absence of extensor pollicis longus tendon function.

At surgical exploration, there was minor disruption of the first dorsal interosseous muscle, laceration of one



**Figure 1.** Laceration in the anatomic snuff box was caused by the water spray.



**Figure 2.** Extensor pollicis longus tendon laceration caused by the high-pressure water stream.

branch of the sensory portion of the radial nerve, and complete transection of the extensor pollicis longus tendon (Figure 2). The tendon laceration was clean, and the edges of the tendon required minimal débridement as part of the tenorrhaphy.

## DISCUSSION

Pressure washers have rapidly entered the armamentarium of home owners and handymen. Many home units are capable of moving 4 gal (15 L) per minute and generating a nozzle pressure of up to 3500 psi (24 MPa). A variety of nozzle spray patterns and angles are available.

Industrial water guns generating pressure streams in excess of 50,000 psi (345 MPa) and moving volumes of

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Dr. Austin was Resident in Orthopaedic Surgery, University of Michigan, Ann Arbor, Michigan at the time of writing. He is now Staff Physician, Northwest Orthopedic Surgery and Sports Medicine, Tuality Community Hospital, Hillsboro, Oregon. Dr. Hankin is Staff Physician, St. Joseph Mercy Hospital, Ypsilanti, Michigan.

Requests for reprints: Fred M. Hankin, MD, Huron Valley Hand Surgery, 5315 Elliott, Suite 202, Ypsilanti, MI 48197 (tel, 734-712-0600; fax, 734-712-0522).

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80 gal (303 L) per minute can cause significant, limb-threatening soft-tissue injuries.<sup>1-4</sup> Soft-tissue problems associated with the extravasation of caustic solutions into the hand have been well documented in the literature.<sup>2,5-7</sup> Pressurized water injection injuries have often been managed by conservative, nonoperative measures because water typically elicits a minimal inflammatory response.<sup>2,4-7</sup> Tendon injuries in the foot have been reported following high-pressure water gun injection injuries.<sup>3,4</sup> The cause of our patient's tendon injury in the hand was the mechanical action and force of the spray rather than the solute/solvent used.

A pressure washer water stream has not previously been implicated as the source of an isolated tendon laceration of the hand.<sup>2,4,5,7</sup> Despite the unusual mechanism of injury, the clinical examination was consistent with a functional deficit later corroborated by the operative findings. As home pressure washer units increase in availability and use, an increased incidence of related injuries can be expected.

## AUTHORS' DISCLOSURE STATEMENT AND ACKNOWLEDGMENTS

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