

Harness Hang Syndrome

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What is Harness Hang? Read on the importance of a rescue plan as well as the impact of fall protection training for the safety of your employees.

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By Mike McCreary

The scenario

A lineman sets up his truck for the repair of a light that the neighborhood has requested be fixed because of a city park across the street. The worker climbs in the aerial bucket and elevates it up to the position where the light can be reached. Then something out of the ordinary occurs. The truck revs higher than normal, and then the bucket as in slow motion tilts and the worker loses balance and falls against the controls. As he does the controls are jammed and the bucket tilts more tossing the worker out of the apparatus. Thanks to a policy accepted by the workers, he is wearing an ANSI approved/certified full body harness. He also has a 6 foot lanyard and shock absorber attached. Both of these help the worker to avoid a thirty-three foot fall. What the relieved worker does not realize is that a stopwatch has been started that will eventually end his life.

To further complicate this situation, as the worker fell he bumped his head against the top edge of the bucket. Though it did not cause a loss of consciousness it did give him a two inch laceration on his forehead. Once he realized he had fallen, and was suspended, he first frantically attempted to reach behind his head and right himself into a position where he could climb back into the bucket. He thought it would be an easy maneuver. What he actually accomplished was to completely exhaust himself due to the surge of adrenaline. Once he realized this he stopped moving and then felt the surge of pain and a warm liquid running down from his forehead. Because this job was assigned only one worker there was no one immediately available to operate the lower bucket controls and lower him safely to the ground.

The worker felt hot and sweaty and fought off a feeling of impending doom.

It has been 3 minutes since the fall. A passerby looked up and saw the worker and called 911. The emergency operator dispatched the closest fire station and the first engine company arrived at the scene 4 minutes after receiving the alarm. 30 seconds to call 911, 45 seconds for the emergency operator to gather the information, 20 additional seconds to alarm the fire engine, and then only 4 minutes for the crew to arrive at the scene. It has now been 8 minutes and 30 seconds since the worker fell.

The engine company arrived at the scene to find that the lineman is now unconscious and does not respond. They immediately locate the controls for the bucket and attempt to lower it to the ground. Finding that the hydraulic controls are not operable they use a ladder from their truck to reach the bucket above the lineman. Once they safety off the ladder a firefighter pulls the lineman over and detaches his lanyard and assist him to the ground. The rescue takes an additional 10 minutes. The fire engine's crew removes the worker from the harness and reports his condition to the arriving paramedics. They immediately start CPR because the worker has no pulse. The paramedics also assumed he must have had a heart attack and proceeded to work a full code on the lineman.

What has occurred?

The scenario described is classic. It is of a death that has gone incorrectly explained for a number of years. This worker died of complications caused by harness hang syndrome.

Harness hang syndrome is also called several other names, a few of these are orthostatic intolerance, crush syndrome and also rescue death. Sadly a majority of rescue workers, paramedics and even doctors miss the call early on. It is the attempt of this article not to solve the issue of harness hang, but to make readers aware of the condition and to encourage emergency workers to open up dialog and discuss this important life threatening occurrence.

Harness Hang Syndrome prevention.

New equipment that assists with the prevention of harness hang syndrome once a fall is realized is appearing on the market constantly. There are different ideas about how to alleviate the problem once a fall has taken place. This equipment can generally be grouped into two divisions. Passive and manually activated. The idea behind the worker activated products is that once the worker experiences a fall and is suspended that he/she would then be able to release a secondary device to assist with the idea of righting oneself. This may be in the form of a webbing ladder sewn to the lanyard that can be released from its holder thus providing a means to climb back up. Another idea is a harness that allows the worker to activate a mechanism that turns the worker from being dorsally attached to a chest attachment point. This allows the worker to reach their attachment point and also to hang in a more recumbent position until rescue arrives. Still others allow a webbing loop to be deployed that provides a standing surface for one to be able to take their body weight off their harness one leg at a time. These and others similar to them all rely on one important fact; the victim is conscious and able to react to the event.

The second division of equipment operates without the worker taking an active role. These devices instantly start to lower the victim from the height suspension. This is in the manner of a controlled decent. They actually place the worker on the ground or other horizontal surface below the point of fall.

Both of the fore mentioned devices are not without their specific shortfalls. The first set are dependent on the worker being conscious whereas the device that lowers the worker may actually lower them directly into another situation that may be as bad as or worse than the original - Such as a utility worker suspended above a primary wire or back yard where a guard type animal is kept. Both of these could prove deadly.

Rescue from harness hang.

Once this type of incident occurs a rescue team should immediately realize the seriousness of the event. Depending on the amount of time that the victim has been hanging the team can take immediate steps if the victim is conscious that could lessen the problems. Some of these steps are to, encourage the victim to move their lower limbs, also to provide a standing surface such as a board or a pipe that the victim could place partial body weight on. This may help to circulate a portion of the trapped blood and to prevent the total trapped blood from becoming as acidotic as it would without this assistance. Both of these can be attempted while a rescue effort is being attempted by other personnel. Another step that should be taken is that advanced life support should be provided as soon as possible.

This ALS care should include bicarbonate solutions that help to counteract the pH problem in the blood as it reach's the heart. The need for ALS support should be recognized early in the event and started as soon as is practical. The victims lowering from height should not be delayed in order for ALS care to be initiated, but once the victim is lowered there should be no hesitation in its application. Paramedics should be better educated as to the mechanism of injury that is caused by harness hang syndrome. Also the paramedics can give a more accurate report of these findings to the emergency room staff so that they can be more aggressive with blood gas analysis to treat the acidotic state. Ordinarily the emergency room staff would not think of treating the acidotic state until later in the patient survey. All of these are ways that education into this occurrence of harness hang syndrome can help to prevent this from taking workers lives unnecessarily.

References

These references were used in the research of this topic.

1. <http://www.osha.gov/dts/shib/shib032404.html>
2. Robertson, David. Orthostatic Intolerance. Vanderbilt University, Nashville, Tennessee.
3. New York Medical College. Orthostatic Intolerance. Vahalla, New York.
4. Seddon, Paul. Harness Suspension: Review and evaluation of existing information. Health and Safety Executive. Research Report 451/2002. 104 pp.
5. Sheehan, Alan. Suspension Trauma. Training handout.
6. Weems, Bill and Bishop, Phil. Will Your Safety Harness Kill You? Occupational Health & Safety. 72(3): 86-88, 90, March, 2003.

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