Conservative Care for Neck Fractures in Older Adults

Physical Therapy in California South Bay for Upper Back and Neck

Researchers from Australia present the positive results of 42 patients with a *Type II odontoid (neck) fracture* who were treated conservatively (without surgery). Everyone in the study was at least 65 years old. Ages ranged from 67 to 91 years old. This type of fracture is most common in older adults who fall and break off the odontoid in the cervical spine (neck).

The odontoid is a bony knob or upward projection of bone on top of the second cervical vertebra (C2). C2 is also known as the *axis*. The odontoid process is also called the *dens*. The dens points up and fits through a hole in the first cervical vertebra (called the *atlas*). The joints of the axis give the neck most of its ability to turn to the left and right.

A Type II odontoid fracture occurs right where the odontoid process attaches to the C2 vertebral body. Without this piece of bone in place, the first two vertebral bones (the atlas and the axis) can slide apart. This puts a tremendous compressive or stretching force on the spinal cord as it goes down through the *spinal canal*. The spinal canal is a round opening or hollow tube formed by the vertebrae stacked on top of each other.

Type II odontoid fractures are unstable because they can be displaced so easily. Nonoperative treatment to allow the bone to knit back together can be successful. In fact, this approach is preferred because of known complications that occur when surgery is done for this problem in older adults. If conservative care fails, then surgery to fuse the spine can be done. Surgery is indicated in cases of nonunion instability such as recurrent dislocation or when there is serious neurologic involvement (e.g., paralysis).

If the atlas and axis have not been *displaced* (moved), then immobilizing the neck for a period of time is an option. The two most common forms of immobilizers used in this study included a rigid *cervical collar* and a *halothoracic brace*.

Results were compared for 10 patients who used the cervical collar and 32 patients who were placed in a halothoracic brace. The halo brace is a titanium ring (the halo) that goes around the head. This portion of the brace is secured to the skull by metal screws (pins). Four metal bars attach the halo ring to a vest worn on the chest. This vest offers the weight to anchor the ring and immobilize the neck. Sometimes the halo brace is referred to as a *halo vest*.

Bracing was used for 12 to 24 weeks. X-rays were taken to see if bone fusion had taken place. Pain and function were two other outcome measures used to compare patient results with conservative care. Function included neck range-of-motion and ability to perform daily activities. Two specific tests of long-term function were used: the *Neck Disability Index* and the *Smiley-Webster Scale*.

Nine of the 10 patients treated with a rigid cervical collar had good results. Cervical spine stability was achieved either by bone fusion or by fibrous union. Fibrous union means the fracture filled in with strong enough scar tissue (but not bone cells) to prevent movement at the fracture site. Ratings from the Neck Disability Index and Smiley-Webster Scale for this group showed mild disability in eight of the patients.
In the halothoracic group, stability of the fracture site was achieved in all 32 patients. But the fracture union rate was lower in this group (37.5 per cent) compared to the patients treated with the cervical collars (50 per cent). Function was good-to-excellent in almost all of the patients in this group. Mild-to-moderate disability was reported in 24 or the 32 patients. No one had severe disability.

These conclusions support the results of other studies that show some disadvantages in using cervical collars alone for Type II odontoid fractures. For example, cervical collars don't always hold the fracture site until healing occurs. Sometimes there is a loss of reduction (the bones slip or displace). The reason for this may be because the collars limit, but don't prevent, neck motion.

Complications can occur with either choice (cervical collar or halo vest). Pressure ulcers (skin sores) develop with either form of immobilization. Infection can occur at the pin sites for the halo brace. Difficulty breathing leading to respiratory problems has been reported. But some experts think that the respiratory compromise and the other symptoms may really be as a result of inactivity and poor follow-up care.

And the potential complications with surgery are much more serious than with nonoperative care. Bone loss in older adults makes surgery very difficult. The surgeon may have a hard time finding solid enough bone to insert screws to help stabilize the spine. Sometimes, the weak or brittle bone fractures when the surgeon tries to place screws to fix the fracture.

Permanent disability can occur if the spinal cord or vertebral arteries are injured during surgery. And the older patients are, the more health issues are present and the greater the risk for complications from the use of anesthesia.

The authors conclude that surgery doesn't have to be the first line of treatment for Type II odontoid fractures in older adults. Unless conservative care fails or there is instability in the cervical spine, nonoperative care has good results.

Clinical and functional results were the same whether the patient healed with a fibrous union or a bony union. In other words, a stable, fibrous union was good enough and may mean the freedom to choose nonoperative care. For an older adult with the increased risk of serious complications, that choice is important. All things considered, results of bracing (conservative care) seem to be best when halothoracic bracing was used instead of a cervical collar.