



Spine Bracing Options: Halo Ring, Crowns, or Vest

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A halo, also known as a "halo ring" or "halo crown," is a piece of equipment that encircles and is fixed to the head of a patient. This device is crucial for the management of a variety of conditions that destabilize the cervical spine.

Background

Although bed-based spinal traction has been used since the early 1930's for the stabilization or reduction of cervical spinal cord injuries, the complications that occur with long-term confinement to bed (pressure sores, muscle wasting, etc.) are considerable. In the late 1950's, the concept of the "halo vest" was first described. This technique is based on the attachment of the halo to a device worn around the patient's torso, rather than to equipment attached to a hospital bed, to provide the needed force to immobilize the cervical spine. The modern version of the halo vest attaches through adjustable metal bars to a rigid, lightweight, fleece-lined vest that fits snugly around the patient's chest. This apparatus provides continuous stability to the cervical spine while simultaneously allowing the patient to be comfortable and mobile.

The advantages of the halo vest include precise positional control and solid external stabilization of the cervical spine, ease of application, a low complication rate, minimal patient discomfort, and early patient mobilization. The halo vest has been shown to be extremely effective at preventing further neurological injury for patients who have sustained cervical spinal injuries. Studies have demonstrated excellent rates of healing after three months of halo vest use; however, in some cases there may be persistent instability from bony or ligamentous damage to the cervical spine and surgery could be necessary to ensure proper stabilization.

At times a halo is needed to stabilize the cervical spine after surgery. Usually the operation was meant to fuse the spine. This means that two or more of the bones in the spine will grow together. The role of the halo is to hold the spine immobile until the fusion matures.

Application of a Halo and Halo Vest

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Fixation of the halo to a patient's head relies on a series of four titanium "pins" which are equally spaced around the ring. After injection of a local anesthetic, the pins are placed in tight connection with the head at two locations on each side (generally over the ridge of the orbit and just behind the ear). The vast majority of patients do not experience significant pain from the pins being too tight; in fact, loosening of the pins is by far the most common cause of pain at the pin sites. Once the halo is in place, the physician may want to keep the patient in bed-based traction for a few days before connecting the vest and getting the patient up and around.

Once the halo vest is in place and appropriately positioned, a series of radiographs are obtained to ensure adequate immobilization and positioning of the cervical spine. When this has been verified, the patient is generally ready to go home. Accepted conservative management of cervical spine instability requires the use of a halo vest for a period of three months. Studies have shown that only a small minority of patients (~2%) find this three-month period to be too long and will not tolerate the halo vest. During these three months, the physician will want to see the patient back at regular intervals to verify the proper positioning and tightness of the halo vest. These visits are usually more frequent early in the course of the treatment. At these appointments, the patient will have the same series of radiographs that were performed initially (again, to ensure adequate positioning and stabilization of the cervical spine). In addition, the physician will do a complete neurological assessment of the patient and tighten all of the hardware on the halo vest.

Side Effects/Complications

Pin loosening is by far the most common of the potential complications. This happens for around 60% of patients over the three-month course and, as mentioned above, can result in some pain at the pin sites. However, this situation is very easily remedied by ensuring tightness of the pins at each of the weekly follow-up visits. Infection at the pin sites is another potential complication that is much less common, occurring in only 10-20% of patients. If a pin site does become infected, the pin will most likely be removed and another pin placed in a new site. Serious side effects are extremely rare, and infection can be avoided by ensuring that daily cleaning of the pin sites is performed. Adequate cleaning of the patient's skin and fleece vest liner are crucial to prevent the

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possibility of localized skin breakdown or the rare pressure sores that can be caused by the vest itself.

Initially, the patient may have some difficulty with balance after having their cervical spine fixed in place with a halo vest. This problem will rapidly improve as the patient becomes more accustomed to the device. The patient may have some difficulty sleeping in the initial period after application of the halo vest. After the vest is removed, some patients feel that their heads are heavy or wobbly, due to weakening of neck muscles which have not been used for some time. This resolves over the next few weeks. Occasionally physical therapy is helpful in alleviating the problem.

In conclusion, the halo vest is an excellent method of cervical spine immobilization that is acceptable to most patients. Side effects and complications are generally mild, if they occur at all, and rates of healing for many cervical spine injuries are excellent. The risks attributable to long-term bed confinement or surgery on the cervical spine can be avoided while simultaneously allowing patients to heal and continue with the majority of their everyday activities.

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