

Invasive Cervical Traction

Application of Gardner-Wells Tongs (CPT code 20660)

Our institute evaluates a substantial number of patients with Chiari I malformations, an abnormality of the skull base wherein there is a limitation of posterior cranial compartment necessary to accommodate the normal brainstem and cerebellum. This leads to displacement of the cerebellar tonsils into the foramen magnum creating a restriction of normal, pulsatile spinal fluid outflow from the intracranial compartment. This circumstance can cause severe occipital headache and brainstem symptoms including balance difficulty, dizziness, swallowing problems, sleep apnea, cardiac arrhythmia, autonomic instability, visual disturbances, and limb numbness and pains.

This condition can be seriously aggravated by head and neck trauma and certain hereditary connective tissue diseases (e.g. Ehlers-Danlos syndrome) characterized by ligament laxity. An important clinical feature in these patients is their beneficial response to cervical traction, which is applied with standard strap and pulley equipment used for physical therapy and/or home use.

This presents a possible option for surgical treatment in the performance of a cranio-cervical fusion using internal fixation and fusion with Danek system bars and screws. This is a permanent and significant intervention with a number of acute and chronic surgical risks.

In the selection of patients in anticipation of such a surgical procedure, patients are next evaluated with the application of invasive cervical traction to assess, at the bedside, their clinical and physical response to the graded application of 7 to 25 lbs of cervical traction. The information gained thereby is then used to 1) advocate surgical treatment and 2) at the time of surgery, position the patient in the optimal extracted position for permanent cranio-cervical fusion.

The application of Gardner-Wells tongs for invasive cervical traction is a surgical procedure performed under MAC anesthesia.

ANESTHESIA: Monitored anesthesia care (MAC) is a specific anesthesia service in which an anesthesiologist has been requested to participate in the care of a patient undergoing a diagnostic or therapeutic procedure.

Monitored anesthesia care includes all aspects of anesthesia care - a pre-procedure visit, intra-procedure care and post-procedure anesthesia management.

During monitored anesthesia care, the anesthesiologist or a member of the anesthesia care team provides a number of specific services, including but not limited to:

- Monitoring of vital signs, maintenance of the patient's airway and continual evaluation of vital functions
- Diagnosis and treatment of clinical problems, which occur during the procedure
- Administration of sedatives, analgesics, hypnotics, anesthetic agents or other medications as necessary to ensure patient
- Provision of other medical services as needed to accomplish the safe completion of the procedure

Monitored anesthesia care often includes the administration of doses of medications for which the loss of normal protective reflexes or loss of consciousness is likely.

Monitored anesthesia care refers to those clinical situations in which the patient remains able to protect the airway for the majority of the procedure. If, for an extended period of time, the patient is rendered unconscious and/or loses normal protective reflexes, then anesthesia care shall be considered a general anesthetic."

OPERATIVE PROCEDURE: The patient is placed on the operating table in the supine position. An intravenous line is implanted. After satisfactory MAC anesthesia had been established, two small areas of the scalp immediately above the pinna of each ear are prepared with triple applications of povidone and iodine. Both areas of the scalp are infiltrated with 5cc of Marcaine 0.5% solution with epinephrine.

After satisfactory local anesthesia has taken effect, Gardner-Wells tongs are brought to the head of the table. The cranial pins are inserted in the scalp 1.5cm above the highest point of the pinna each ear. The pins are advanced through the outer cortex of the skull into the diploe. The pins are then secured in place with locking screws.

The patient is then transferred to a hospital bed with an overhead frame and pulley system. Invasive cervical traction is usually applied starting at seven pounds extraction weight and increased with detailed clinical and neurological testing as necessary.

OBJECTIVE: During the application of traction at varying weight loads the patient is observed for critical functional and objective neurological parameters (e.g. headache, nystagmus, dizziness, dysphagia, dysphonia, sensation in the arms and legs, and corticospinal tract signs (i.e. hyperreflexia). In addition, a fluoroscopic assessment is made of the degree of closed reduction of odontoid angle with respect to the clivus and foramen magnum. Continuing at 6 hour intervals, the patient is reassessed for a critical, individually chosen, subset of parameters with application and relaxation of specified traction weights.

In the case of negative testing the patient is discharged the following day or prepared for appropriate surgical management within 24 to 48 hours.