Brown-Sequard Syndrome : Causes, Pathophysiology and Symptoms

Brown-sequard syndrome is a condition that results from damage (resection) to one half of the spinal cord on either side.

This hemisection causes damage to the spinal cord tracts which are pathways for transfer of information to and from the brain.

Hemisection often occurs in the cervical spinal cord and it is rare for the entire hemisection to be affected, but this does occur, more often incomplete hemisection occurs.

This syndrome results in weakness or paralysis (hemiparaplegia) on one side of the body and a loss of sensation (hemianesthesia) on the opposite side.

Brown-Sequard syndrome most commonly occurs in the thoracic spine (upper and middle back)

Basic anatomy and physiology of the spinal cord

A sensory stimulus passes through **three neurons**

The lateral branch of the first order neuron carries info to the dorsal root.

The second-order neuron crosses over to the opposite side of the spinal cord

The third order neuron located in the ventral posterior region of the thalamus to the sensory cortex of the brain.

Causes of a brown-sequard syndrome

There are several causes of Brown-Sequard syndrome, including:

- A spinal cord tumor,
- Penetrating trauma (such as a puncture wound to the neck or back),
- Infectious or inflammatory diseases (tuberculosis or multiple sclerosis), and
- Disk herniation
- Ruptured intervertebral disc
- Ischemia (obstruction of a blood vessel), or

Signs and symptoms

1. Loss of pain and temperature contralaterally for body regions from affected dermatome and down
a small region of bilateral loss of pain and temp at the level of the lesion and 2 segments below

2. Motor Effects: – Ipsilateral Spasticity and Weakness

3. Loss of fine discrimination touch, vibration, and position sense ipsilaterally for body regions from affected dermatome

Diagnosis

Diagnosis is made by an MRI

Treatment

Treatment varies depending on the underlying cause.

Treatment for Brown-Sequard syndrome patients focuses mainly on the underlying cause of the disorder.

Early treatment with high-dose steroids may be beneficial in many cases.

Physical, occupational and recreational therapy.

Another treatment is symptomatic and supportive.