of active bleeding) or after failure of LMWHs. Novel oral anticoagulants have not yet been studied in the cancer setting.

SPINAL CORD COMPRESSION

Epidemiology

Spinal cord compression is the second most common neurologic complication of cancer after brain metastasis; it is estimated that 2.5% of cancer patients will suffer from cord compression. Breast, lung, and prostate cancers and multiple myeloma are the most common etiologies.

Pathology

Most cases (60% to 70%) occur at the level of the thoracic spine, followed by the lumbar and cervical spine. The conus medullaris terminates at the level of the L1 or L2 vertebral body; epidural disease below that level is associated instead with a cauda equina syndrome. Most spinal metastases affect the vertebral body; compression results from posterior extension of the tumor to the thecal sac. This leads to obstruction of the epidural venous circulation and vasogenic edema of the white and gray matter.

Clinical Presentation

Cord compression usually manifests with gradually worsening back pain around the level of involvement. Sudden positional back pain should raise the suspicion for vertebral compression fracture instead. Pain can become radicular and is usually worsened by the Valsalva maneuver. Sensorimotor neurologic deficit is a sign of advanced cord compression. Motor weakness is more common at presentation (up to 85% of patients); it is usually symmetric, but radicular motor weakness may be noticed with lateral vertebral metastases. Sensory deficit is less common and can manifest as paresthesia or lack of sensation. Bowel and bladder incontinence and urinary retention are usually late findings.

Diagnosis

Cord compression should be suspected clinically with any new back pain in the setting of cancer and rapidly investigated with spinal imaging. Plain radiographs of the vertebrae can reveal abnormalities such as lytic lesions or vertebral fractures, but magnetic resonance imaging (MRI) is the preferred diagnostic imaging modality. MRI of the full spine should be obtained even with localized symptoms, because multiple vertebral levels may be affected.

Treatment

The magnitude of the neurologic deficit before treatment is a good predictor of response and outcome. On diagnosis, pain management is important to allow better ambulation. Glucocorticoids have been used, while definitive therapy is awaited, at doses between 16 and 96 mg/day with both symptomatic and functional relief. There is no proven advantage to higher doses, which can be associated with more side effects. Surgical decompression and radiation are the two main treatment modalities.

In a phase III trial, 101 cancer patients with spinal cord compression were randomly assigned to receive radiation alone (30 Gy in ten fractions) or surgical decompression followed by the same radiation regimen. More people in the surgical arm were ambulatory at interim analysis (84% versus 57%), and more people in that group regained the ability to walk (10/16 versus 3/16). Radiation therapy alone is useful for palliation of symptoms and local control; it is usually reserved for patients with spinal cord compromise without neurologic deficit or for those with an expected shorter survival time. Initial chemotherapy can be used in highly chemosensitive malignancies such as certain lymphomas or small cell lung carcinoma. Patient age, overall prognosis, and other comorbidities should be considered in treatment decision making.

SUPERIOR VENA CAVA SYNDROME

Definition

Superior vena cava syndrome in malignancy is the result of flow obstruction by either external compression or intravascular thrombosis. The superior vena cava is thin walled and therefore easily compressed. The most common malignant causes are lung cancer and lymphoma.

Clinical Presentation

Presentation depends on the rate of obstruction. Slow compression allows for the development of collaterals from the azygos, internal mammary, paraspinous, lateral thoracic, and esophageal venous systems. The azygos vein is the most important of these, and obstruction below its level is not well tolerated. Symptoms can be sudden or insidious. Most patients experience dyspnea (60% to 70%) and facial or neck swelling (50%). Cough, pain, arm swelling, and dysphagia are less common. Symptoms are frequently exacerbated by leaning forward or lying down. Physical findings may include venous distention of neck and chest wall, facial edema, plethora, cyanosis, and upper extremity edema.

Diagnosis

Plain chest radiographs are usually abnormal; mediastinal widening (64%) and pleural effusion (26%) are the most common findings. The diagnosis is best established with contrast-enhanced computed tomographic scanning of the chest. It demonstrates the location and size of masses, the presence of intravascular thrombosis, and collateral venous drainage. When superior vena cava syndrome is the initial manifestation of malignancy, pathologic diagnosis is the first step in establishing the proper initial treatment modality.

Treatment

The goals of treatment are to alleviate symptoms urgently and to treat the underlying malignancy. General supportive measures include head elevation and administration of glucocorticoids and diuretics. It is essential not to start radiation or glucocorticoids before obtaining a biopsy, because they could mask the diagnosis. Specific management depends on the underlying pathology. Chemotherapy is the preferred first line of therapy for chemosensitive malignancies such as lymphoma, small cell lung cancer, or germ cell tumors. For non–small cell lung cancers and other less chemosensitive tumors, initial radiation therapy may be preferred.