Introduction

Arteriovenous malformations (AVM) are a rare cause of nontraumatic spinal cord injury (NTSCI). Arteriovenous malformations are categorized as Type I or Arteriovenous (AV) fistulas, Type II which are intramedullary, Type III or Juvenile AVM and Type IV. Type I and Type II AVMs are common compared to Type III and Type IV (1). The most common presenting symptoms are gradual onset of sensory abnormalities, pain, bowel and bladder dysfunction, rarely acute neurological worsening from bleeding (2). The proposed theories for spinal cord damage in AVM are venous hypertension and thrombosis causing ischemia or infarctions. Early diagnosis and treatment of these vascular malformations can reverse the myelopathy (5). Unfractionated heparin or low molecular weight heparin is widely used in clinical practice for anticoagulation and bleeding is a known complication (2). The occurrence of spontaneous bleeding from undiagnosed arteriovenous malformations after anticoagulation has not been previously reported.

Case

The patient is a 66 year old female with past medical history of hypertension, hyperlipidemia and diabetes mellitus who presented to the emergency room with chest pain. After initial investigation, the patient was diagnosed with non ST elevation myocardial infarction (NSTEMI) and was treated with aspirin, clopidogrel and low molecular weight heparin as per protocol. Twenty four hours after commencement of anticoagulation therapy the patient started experiencing low back pain and progressive lower extremity weakness with eventual paraplegia and associated neurogenic bowel and bladder. Magnetic resonance imaging (MRI) of her thoracic spine showed intrathecal, subdural and subarachnoid hemorrhage with mass effect below T10. After the angiogram, the patient was diagnosed with dural AVF. The patient subsequently underwent T11 to L3 laminectomy and evacuation of hematoma as well as removal of nidus. Post-surgical MRI of the thoracic spine with expansive from T6 through the T12 level. On exam, the patient had 0/5 motor strength in bilateral hip flexors, knee extensors, ankle plantar flexors, great toe extensors and ankle dorsi flexors. Patient's deep tendon reflexes in the bilateral lower extremities were absent. Her sensations to light touch and pin prick were absent below T6. During her hospital stay patient experienced autonomic dysreflexia which was treated with nitroglycerine topical gel. Patient was discharged to an acute rehabilitation facility on hospital day 10.

Preoperative MRI showing intrathecal, subdural and subarachnoid Hemorrhage below T10

Postoperative MRI showing spinal cord edema from T6 to T12

Discussion

Spinal cord injury secondary to AVM ranges from asymptomatic to sensory and motor disturbances and paraplegia. Studies have shown that early diagnosis and treatment of AVM resulted in various levels of improvement in bowel, bladder, sensory, sexual and motor function (3,4,6,8). When presented early, modern imaging modalities like MRI or angiogram will allow the clinician to accurately diagnose AVM and determine the treatment plan. The challenge comes when patients with undiagnosed AVM require anticoagulation or thrombolytic treatment. This combination poses a high risk for bleeding in theory as well as in practice as evident in our patient. Screening for spinal or intracranial AVM would potentially avoid permanent disability; however, it is impractical and less cost effective to screen patients for AVM who need anticoagulation. Nevertheless, treatment with anticoagulants or thrombolytics could be lifesaving in certain situations regardless of diagnosis of AVM. While the current practice of rehabilitation in spinal cord injury secondary to traumatic vs. non-traumatic remains similar, making other clinicians aware of the bleeding tendencies of AVM/AVF before considering anticoagulation is advantageous. The functional outcome of spinal cord injury after such an injury may not be as good as traumatic spinal cord injury (7).

Conclusion

The screening for AVM/AVF before anticoagulating any patient is not cost effective. However, early diagnosis and treatment of AVM/AVF with modern therapeutic modalities can potentially save patients from permanent disability.

References