Spinal Vascular Malformation

General information

Often also referred to by the term spinal AVMs, which technically refers to a subset of spinal vascular malformations (SVMs). The incidence of SVM is about 4% of primary intraspinal masses. 80% occur between age 20 and 60 years [1)].

The literature on spinal vascular malformations contains a great deal of confusing terminology. Some of the nomenclatures is inconsistent with the lesions described.

History

Epochs

Black [2)] identifies three epochs in the development of the concepts and treatment of spinal vascular lesions:

1) early observations (1860s-1912), with the lesions during this time period recognized only at autopsy

2) the “middle ages” (1912-1960), with surgical intervention sporadic and yielding dismal results

3) the modern era (beginning in the 1960s), coincident with parallel dramatic advances in radiology, microsurgical instrumentation, and anesthesiology. These advances resulted in a better understanding of the pathophysiological aspects and angioarchitecture of the lesions. Whereas the nomenclature of the lesions in the past was confusing, a new understanding of these diseases that have emerged during the modern era has permitted refinement of the classification of the lesions as distinct biological entities. Modern diagnostic imaging has enabled the identification of patients who may benefit from surgical or embolic occlusion, and treatment has become rationally based. Future progress in the management of spinal vascular lesions may be anticipated, with improvement in noninvasive imaging for early detection of suspected abnormalities. Furthermore, advances in spinal cord neuroprotection may expand the range of future options for surgical or embolic intervention [3)].

From the earliest observations of spinal vascular malformations, successful management has been challenging. Initially the challenges were diagnosing, understanding, and treating these lesions. They were originally considered all to be the same, or at least to be a single general type, of disease. With the introduction of selective spinal arteriography in the 1960s and more recently with the introduction and widespread use of MR imaging, the initial challenge of diagnosing spinal vascular malformations was overcome, and significant progress has been made in understanding their anatomy as well as the pathophysiology that underlies the myelopathy commonly associated with them. The anatomical features defined by selective arteriography and the observations permitted with the operating microscope ultimately led to distinctions between the major categories of the vascular lesions affecting the spinal cord; these distinctions were based on the lesions' anatomy, epidemiology, and

the mechanism of spinal cord injury [4].

Epidemiology

The incidence of SVM is about 4% of primary intraspinal masses. 80% occur between age 20 and 60 years [5].

Classification

Spinal vascular malformation classification.

Clinical features

Spinal Vascular Malformation clinical features.

Diagnosis

Spinal Vascular Malformation Diagnosis.

Treatment

Spinal Vascular Malformation Treatment.

Case series

Spinal Vascular Malformation case series.

References

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Youmans JR. Neurological Surgery. Philadelphia 1982
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[4]
Oldfield EH. Introduction: Spinal vascular malformations. Neurosurg Focus. 2009 Jan;26(1):E1. doi: 10.3171/FOC.2009.26.1.E1. PubMed PMID: 19119887.