

Penetrating Ulcers of the Aorta

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Penetrating ulcers represent one of several atherosclerotic, degenerative diseases of the aorta. It is relatively more common in the thoracic aorta as compared to the abdominal aorta, but with respect to other degenerative pathologies such as aneurysms, penetrating ulcers occur in less than 15 percent of cases. On CT angiograms, penetrating ulcers are characterized by a focal disruption of the aortic wall involving only a discrete section of the total aortic circumference. The ulcer may be filled with either blood and/or thrombus, and may extend extramurally beyond the limits of the actual disruption. Elements of the aortic wall may or may not be seen surrounding the ulcer. Depending on the size and neighboring changes of the aorta, penetrating ulcers have also been classified as either “saccular” aneurysms or chronic pseudoaneurysms.

The pathogenesis of penetrating ulcers has been a subject of some controversy. There has been inconclusive evidence that penetrating ulcers and intramural hematoma, another relatively infrequent aortic pathology, may represent forme fruste of aortic dissection. While perfect examples of each of these diseases can demonstrate certain easily recognizable features on cross-sectional imaging, there are often instances where elements of each of these entities co-exist within the same patient.

As with most degenerative aortic lesions, penetrating ulcers are discovered incidentally on CT angiograms or occasionally on plain chest x-rays obtained for unrelated reasons. The natural history of these lesions is ill-defined. There is no good evidence to recommend any specific size criteria for repair of asymptomatic lesions, especially given the fact that the sizing of these lesions has been variable in the literature with some reporting the overall wall-to-wall diameter of the ulcer including the aorta and others reporting just the depth of the ulcer. However, when the ulcer becomes symptomatic, it should be repaired urgently to avoid the risk of rupture. In general, for good risk patients, elective treatment can be considered in ulcers greater than two-cm in depth.

While surgical repair may always be an option in select patients, the focal nature of these lesions makes them ideally suited for endovascular repair. In most cases, there is a suitable proximal and distal landing zones and a short endograft may be used to achieve a satisfactory, durable repair. Typically, the procedures are technically straightforward and associated with a low incidence of stroke or spinal cord ischemia. That being said, lesions occurring near the distal arch or supraceliac aorta require the same degree of meticulous technique, careful sizing and planning as in the repair of conventional aneurysms. In such cases, adjunctive procedures such as left subclavian revascularization or diligent evaluation of visceral collateral circulation are required to avoid vertebrobasilar insufficiency or hepatic ischemia.

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