

Aortic aneurysm: Imaging modality for risk assessment: A comprehensive review

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Introduction: Aneurysm size assessment is one of the most useful tools to risk stratify patients with AAA. This is the only guideline available. The risk of AAA rupture warrants intervention with diameter of 5.5 cm or growth rate more than 1cm/year. Mortality reduction can be achieved up to 53% by using abdominal ultrasound screening. Hence, we performed a comprehensive review of imaging studies for AAA risk assessment.

Methods: We aimed to evaluate the different imaging modalities and techniques other than the standard that could predict earlier AAA growth and rupture.

Discussion: MRI studies using ultrasmall particle of iron oxide has the capability of penetrating deeply into the very tight interstitial endothelial pores rich in inflammatory has been used to study to delineate and identify areas of active inflammatory changes within the aortic wall that predict aneurysm formation and higher growth rate compared to those areas with no or unspecific contrast uptake which ultimately correlated with AAA formation and growth. Temporal monitoring of longitudinal AAA progression and collagen content within the wall by molecular MRI determined that reduced collagen amount correlated with increased risk of aneurysm progression or rupture. MRI has been used for macrophage counting within the aneurysm wall and is associated to collagen breakdown and aneurysm growth. Direct measure of collagen content in the aneurysm wall of mice using a collagen-specific gadolinium-labeled lipid micelle found an association between decreased collagen content and increased risk of aneurysm rupture. For the last, SPECT can determine specific sites of the vessel wall that presents with increased metabolic activity that was associated with acute symptoms and high wall stress in AAA.

Conclusion: Imaging modalities other than usual methods can also predict earlier AAA growth and rupture and be used as an adjunctive diagnostic tool for AAA assessment.

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