

Title : Calcium accumulation: A new marker of AAA risk

Abdominal aortic aneurysm (AAA), an enlargement of the lower aorta, is generally defined by its size, with a 50% increase in diameter over normal being a common diagnostic index. However a one-time snapshot of the aneurysm's dimensions reveals nothing about the rate of its expansion, an important clinical feature when assessing clinical risk. And risks of AAA rupture increase greatly when the diameter expands beyond a certain point, like a time bomb that can explode without warning —the failure of this massive vessel is associated with mortality rates of up to 85%.

A new study by a team led by the University of Tokyo's Atsuko Nakayama, published in *Circulation Journal*, now reports calcium accumulation as a useful metric of AAA expansion, which coupled with aneurysm diameter, may benefit clinical decision-making with regard to both surveillance and repair. The authors find that the degree of calcification of the aortic wall is inversely correlated to the rate of AAA expansion, a finding with potential implications for both monitoring and intervention.

The team made a retrospective study of a cohort of 414 patients with infrarenal AAA at the University of Tokyo Hospital between 2003 and 2011. They used computed tomography (CT) imaging to measure the extent of aortic calcification. Previous work by another group had shown that aneurysms expand more slowly in AAAs with greater accumulations of calcium; diabetic patients, for example, typically show greater amounts of mural calcification, but lower AAA prevalence and slower aneurysm growth. This prompted Nakayama and her colleagues to look more closely for possible relationships between calcification, AAA diameter, and rate of expansion.

Comparing the calcification index as initially measured by CT with that taken at a follow-up scan, they found that all patients tended to show higher calcium accumulation over time. Interestingly, higher calcification was significantly associated with the annual rate of AAA expansion, as calculated by change in diameter over the number of years between CT images. Given that faster-expanding AAAs are at greater risk of rupture, the authors suggest that less-calcified aneurysms should be followed-up more frequently than more highly calcified ones. However, as noted in an accompanying editorial by Hiroki Aoki of Kurume University, it remains unclear why more calcified AAA expands more slowly. That question, once answered, may shed new light on the tangled relationship between abdominal aortic aneurysm and atherosclerosis.

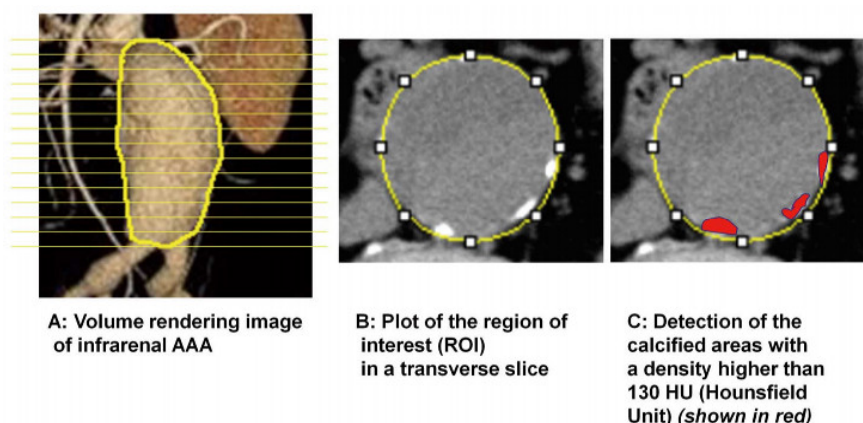


Fig 1. from Atsuko Nakayama, Hiroyuki Morita, Naoto Hayashi, Yukihiro Nomura, Katsuyuki Hoshina, Kunihiro Shigematsu, Hiroshi Ohtsu, Tetsuro Miyata, Issei Komuro. Inverse Correlation Between Calcium Accumulation and the Expansion Rate of Abdominal Aortic Aneurysms *Circ J*. 2016;80(2):332-339