

## Use of imaging to guide heart attack treatment



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According to an expert consensus paper published in the European Heart Journal, imaging provides a more precise diagnosis of a heart attack that can be used to individualise treatment.

Currently, heart attacks are diagnosed and treated using coronary angiography. While invasive imaging can provide more detail of the arteries, its use is still limited in clinical routine because of significant debate and controversy. This particular paper aims to resolve this debate and promotes the adoption of intracoronary imaging in two major areas: 1) acute coronary syndromes including heart attack and 2) when diagnostic information from angiography is unclear.

The paper also provides specific criteria when invasive imaging should be used and in which patients. There is criteria for assessment of the arteries, interpretation of images, choice of treatment, and guidance during stent insertion (percutaneous coronary intervention; PCI). There was a time when it was assumed that acute coronary syndromes were caused by ruptured plaque. But with the use of intracoronary imaging, it has now been identified that there are other causes such as plaque erosion and eruptive calcified nodules that should also be addressed when outlining treatment. Intracoronary imaging also shows thrombus, which angiography may miss or misidentify.

"Imaging is more accurate, helps guide decisions and facilitates tailored therapy, especially in younger heart attack patients who more frequently have plaque erosion or non-atherosclerotic coronary artery disease," said senior author Dr Giulio Guagliumi, of the Ospedale Papa Giovanni XXIII, Bergamo, Italy.

Coronary angiography can often provide incomplete information and may not identify the culprit lesion specifically. In some heart attack patients, there may be multiple lesions contributing to the disease. This is not clear with coronary angiography. But intracoronary imaging provides clarity before and during PCI. This is especially useful keeping in mind the fact that in ageing patients and patients with diabetes, more than one lesion may be causing the heart attack. This is difficult to detect with angiography and can be more challenging for PCI. Angiography is also not very specific for certain anatomies such as tortuous vessels and aneurysms.

Patients who are referred for PCI tend to have comorbidities and complex coronary artery disease. Intracoronary imaging can be very useful in these patients and could provide greater benefit in patients with non-ST elevation acute coronary syndromes, calcified vessels, long lesions or in-stent restenosis. According to Dr. Guagliumi, imaging companies generally focus more on improving image quality but they should also pay attention to making imaging systems more user-friendly for clinicians and should be designed to provide automated analysis and classification.

He concluded: "The role of intravascular imaging to diagnose acute coronary syndromes, select treatment, and guide PCI will continue to grow. With it we expect to achieve superior long-term outcomes."

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