

Coronary Angiography: No Longer The Gold Standard?

Despite tremendous advances in non-invasive cardiac diagnosis, Coronary Angiography remains the only means of looking at Coronary anatomy in the living patient. Coronary obstructive lesions seen in this manner have been classified as a percentage reduction in lumen profile diameter compared to the normal adjacent coronary lumen. This way of describing coronary lesion as a percent stenosis was based on good experimental data and therefore any lesion showing greater than 50% diameter narrowing was classified as a significant stenosis.

Over the years, this "Gold Standard" of determining the significance of coronary lesions has been seriously questioned. First came the autopsy studies which showed a consistent under-estimation of Coronary narrowing by angiography even when the arteries were fixed under pressure. This was mainly because a large number of patients have diffuse disease. Therefore, in reality a more diseased area was being compared to a less diseased area rather than the diseased area versus completely normal vessel. So, other anatomic variables besides percent stenosis, e.g. Lesion mean or minimum diameter, lesion mean or minimum area, computer assisted geometric or video densitometric generation of these indices and more complex indices like calculated pressure drop across the lesion, were introduced but all had a wide range of confidence limits compared to the "New Gold Standard", that of Coronary Flow Reserve, i.e., increase in concerned vascular bed flow after maximum vasodilatation. This means that while, as an index of severity, anatomy is a good guide to the resultant derangement of physiology in various grades of stenosis, in individual cases, however, anatomic variables cannot totally define the physiologic dysfunction thereby produced in a particular coronary bed. And, as decision regarding intervention has to be made in each individual, it becomes imperative to have evidence of physiologic derangement before a decision is made on coronary anatomy alone. This may mean a simple history of angina, a positive ETT or Thallium Test or Nuclear Angiogram or a PET scan or an estimate of coronary flow reserve. Looking back, it is surprising why it was not clearly realized that such would be the case, right from the introduction of Coronary Angiography.

As if the above was not enough of a limitation of Coronary Angiography, think of the fact that a third of the lesions resulting in the ultimate complication of coronary disease, i.e., acute myocardial infarction are those that would be classified as hemodynamically not significant, i.e., not capable of even producing ischemia, leave aside infarction!

Azhar Faruqui
Editor.