Stenosis Grading

There are many different methods to grade the degree of stenosis, including visual assessment; manually determined diameter or cross-sectional area on multiplanar reformats perpendicular to the median centerline of the vessel ("end-on" view); diameter on maximum intensity projection (MIP) images parallel to the long axis of the vessel; and software calculation of diameter or area. Dodd et al found that the cross-sectional area technique had the highest correlation with quantitative coronary angiography, and MIP technique had the smallest interobserver variability. Grading is less accurate in calcified plaques and in distal coronary vessels.

Maximum intensity projection (MIP): MIP image of a left anterior descending (LAD) artery stenosis secondary to calcified plaque. MIP images parallel to the long axis of the vessel can be used to assess the degree of stenosis.

"End-on" multiplanar reformat (MPR): "End-on" MPR view (perpendicular to the median centerline of the vessel) of a left anterior descending (LAD) artery stenosis secondary to calcified plaque. The degree of stenosis could be assessed on this view visually, or from manually or software-calculated diameter or cross-sectional area. Because the spatial resolution is inadequate for precise grading, coronary stenoses are often graded with semiquantitative descriptors such as normal, mild (< 50%), moderate (50–70% stenosis), severe (>70% stenosis), and occluded.

Stenosis is typically overestimated in areas where heavily calcified plaques are present. Zhang et al offer the following suggestions to better assess the degree of stenosis when calcified plaques are present:

- A significant luminal stenosis is unlikely if the plaque thickness measures 50% or less of the diameter of a nearby normal segment and if it is eccentrically positioned on a cross-sectional multiplanar reconstruction (MPR) view or there is visible lumen adjacent to the plaque on a long-axis MPR view.
- A significant stenosis is likely if calcified plaque fills the entire central portion of the lumen on a cross-sectional MPR image.
A significant stenosis can be suggested if calcified plaque is 50% or greater than the diameter of a nearby normal segment on cross-sectional MPR images but does not completely fill the lumen; however, the interpreter might add that CCTA may overestimate the degree of stenosis in this situation.