Comparing Radiation Doses From 2 Diagnostic Tests

This letter is a comment on the recent study in *JACC* by Coles et al. (1) on the “Comparison of Radiation Doses From Multislice Computed Tomography Coronary Angiography and Conventional Diagnostic Angiography.”

I would like to congratulate the investigators for pointing out the radiation doses of both of these diagnostic tests. Most cardiologists have no idea of the radiation dose with either technique. In fact, I suspect if polled, most cardiologists would think that coronary angiography delivers more of a radiation dose to the patient than multislice computed tomography (CT).

The administration of contrast agents also puts the patient at risk for kidney damage and allergic reactions, and oftentimes beta-blockers have to be used for rate control. Despite these limitations, I expect that multislice CT is here to stay and will obviously get better as techniques improve and radiation doses decrease. However, it is not clear what the radiation dose will be with 64-slice and beyond.

One of my major concerns is the abuse of multislice CT. Because most nonradiologist physicians do not understand the radiation dose delivered to the patient with this technique, the technique is commonly used in the emergency department when a simple chest X-ray would be adequate. In addition, if patients are admitted to hospital, it is not uncommon for several multislice CT examinations to be done in the same patient.

The excellent accompanying editorial to this piece by Zanzonico et al. (2) argues that multislice CT is “safer” than cine cardiac angiography (excluding contrast reactions). I am not completely willing to buy that position. Cardiac catheterization and angiography is the only method to measure intracardiac and vascular pressures accurately, it readily evaluates left ventricular function, myocardial perfusion, coronary artery pathology, myocardial viability, valve function, peripheral artery disease, and when ultrasound or ocular coherence tomography is used, the coronary arterial wall. Microcirculation can be assessed using coronary flow reserve, myocardial blush, and presence of collaterals (3).

In my opinion, cardiac catheterization and contrast cine angiography still remain the reference standard for everything else we do and is the best buy for the radiation dose delivered.

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**REFERENCES**


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**Reply**

We appreciate and agree with Prof. Conti’s insightful commentary and the perspective he provides. We do not advocate either multislice computed tomography (MSCT) or conventional coronary angiography as the superior diagnostic modality (1). Rather, we have attempted to place their respective radiation risks in the context of total procedure risk. Although there is a greater procedure risk associated with selective coronary arteriography than with MSCT, this is only one component of the total decision-making process. Catheterization, with intent to treat, provides a range of options that can be readily exercised during the procedure. Depending on the clinical circumstances, selecting catheterization with the potential to perform a percutaneous intervention, rather than MSCT, might be entirely appropriate. However, in the patient where there is uncertainty about the diagnosis or where a “road map” may expedite the interventional procedure, MSCT may be a valuable first step in the process.

Patients will, of course, ultimately benefit by receiving the appropriate diagnostic and therapeutic procedures. Prof. Conti has identified circumstances where conventional coronary angiography is the “gold standard,” and clinical considerations would, justifiably, lead the physician to choose conventional over MSCT coronary angiography. Our contention remains that this choice should, however, not be based on dosimetric considerations.

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