The Importance of Clinical Evaluation in Managing "Atypical" Chest Pain

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The Case

A middle aged male with a two-day history of substernal chest pain and headache, presented to the Emergency Department(ED). His medical history included chronic hypertension, hyperlipidemia, and he had been a previous cigar smoker. An EKG showed sinus bradycardia at 49 beats per minute and early repolarization. No changes were evident when this EKG was compared with the one performed four years prior. His cardiac enzymes were within normal range. The ED physician discharged the patient with instructions to follow up with his primary care physician (PCP).

Within the next two days the patient was evaluated by his PCP, followed by another ED physician. His symptoms were unchanged, and the EKGs and cardiac enzymes continued to be interpreted as normal, except that now, he complained specifically about left sternal pain radiating to his left arm. The ED physician transferred the patient, by ambulance, to the hospital, where he was admitted by his PCP. The PCP requested a cardiology consult.

The morning after admission, a cardiologist, and her physician assistant (PA), evaluated the patient. He denied shortness of breath, nausea and vomiting, swelling or current chest pain. The PA described the patient’s chest pain as “atypical”. Other than sinus bradycardia, the EKG was again read as normal. The cardiac enzymes were unremarkable with the exception of troponin, which was slightly elevated at 0.11. The patient's LDL was 251. The PA’s initial plan was to consider a nuclear stress test to evaluate for ischemia. The cardiologist's notes, which followed the PA’s, indicated agreement with the diagnosis of “atypical chest pain, likely musculoskeletal". However, in light of the
symptoms, the cardiologist suggested a Thallium study. If the Thallium study was positive, then the patient would undergo cardiac catheterization. If negative, the patient would be discharged and receive follow-up care from his PCP and the cardiology group.

On day seven of his symptoms, the patient had a Thallium stress test. The on-call cardiologist interpreted the Thallium scan along with the other studies that were done.

He did not have the patient’s report in hand, nor could he recall his specific interpretation when he relayed to the PCP that none of the studies he had reviewed that morning warranted an immediate cardiac catheterization. Based on this discussion, the PCP discharged the patient from the hospital.

Two days after he had spoken with the PCP, the on-call cardiologist re-reviewed the patient’s nuclear study and his handwritten note. His note read, “It [the Thallium Scan] was a poor quality study with significant motion artifact, with possible reversible defects.” He had also written that he “could not exclude a cardiac ischemic etiology.” The cardiologist contacted the PCP, advising her to refer the patient back to him for a follow-up appointment. He denied that he had changed his mind regarding the Thallium scan. Instead, he said he was providing her with his official read of the study. The patient died two days before the appointment, and exactly 10 days after the onset of his “atypical” chest pain.

An autopsy determined the patient had an ischemia-induced arrhythmia, which caused sudden death. Also noted on the report was that both the patient’s left main and right coronary arteries were 90% stenosed.

The lawsuit alleged both cardiologists negligently failed to identify the patient’s significant cardiac risk, and should have performed the cardiac catheterization while he was in the hospital. The case was settled against the two cardiologists and their group for a large amount.

**Clinical Risk Management Commentary**

Patients with what is termed “atypical chest pain” form a substantial proportion of emergency admissions. The symptoms often persist or recur. The most common cause of atypical chest pain is non-ischemic. However, the lack of a definitive diagnosis may lead to inappropriate chest pain investigations and management.

Cardiology experts who reviewed this case opined:

1. The use of the term “atypical” as a description may not adequately represent the complex set of a patient’s symptoms. The term “atypical” can promote an inconclusive management strategy.
2. The patient’s history of “exertional chest pain associated with radiation to the left arm and relieved with rest” is problematic.
3. One of our experts was concerned about the elevation in troponin, and felt this change was significant.
4. Because the Thallium stress test was inconclusive due to poor quality, cardiac ischemia could not be excluded. At that point, the experts stated the standard of care required that the patient undergo timely further evaluation with cardiac catheterization. If the cardiac catheterization had been performed shortly after the Thallium study, the patient could have been diagnosed, treated, and sudden death avoided.
5. The patient had “balanced” coronary artery disease. In this setting, the nuclear stress test, Thallium in this case, may be normal due to global hypoperfusion. Always consider this possibility as part of the clinical evaluation and decision-making process, particularly when studies are not conclusively normal.
6. Please note: An autopsy report is not necessarily conclusive evidence of what a cardiac catheterization would have shown. Post-mortem coronaries evaluated by autopsy frequently show a greater percentage of narrowing than a viable artery with internal pressure.

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