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Pre-operative EKGs – pitfalls of unexpected findings

Story from the Front Lines:

“They say something’s wrong with my heart” the man begins, “I thought I just had the colon cancer to deal with, but now this.” In his 70s, he had been lucky to avoid any major medical problems aside from his recently diagnosed malignancy. Thankfully, his surgeon hopes to cure him with a sigmoidectomy. A very pleasant and active man, he is on no medications other than a ‘statin,’ exercises regularly, and had no prior cardiac history. He arrived for his surgery this morning in his usual state of good health, though recalls his surgeon was concerned that he did not have pre-operative ‘clearance’ from his primary care doctor though the patient was completely asymptomatic without any history concerning for CHF or ischemic heart disease. His surgeon ordered an EKG that morning per usual protocol, which was interpreted by the EKG machine as “Junctional Rhythm” – thereby causing his case to be canceled and leading to direct admission to the Internal Medicine team.

Teachable Moment:

Our asymptomatic, though elderly patient had a screening EKG performed immediately prior to his non-elective, time-sensitive surgery – was this necessary? Unfortunately, major societies provide no strong guidance in this situation. The European Society of Cardiology & European Society of Anesthesiology joint guidelines state: “Pre-operative ECG may be considered for patients who have no risk factors, are above 65 years of age, and are scheduled for intermediate-risk surgery. “ This was assessed as a class IIb, level C recommendation suggesting it is based on “only consensus opinion of experts, case studies, or standard of care”.ⁱ Similarly, the 2014 American College of Cardiology / American Heart Association guidelines assign this a class IIb, level B recommendation.ⁱⁱ Both sets of guidelines recommend against (class III) routine preoperative EKG’s in asymptomatic patients for low-risk surgery, though our patient’s would qualify as intermediate risk. Thus, based on current guidelines the ordering of this EKG pre-operatively is within the accepted standard of care though not based on high-quality trials or data.

There is a second, perhaps more major issue in this case as well – reliance on the machine EKG read. “Computer-based interpretation of the ECG is an adjunct to the electrocardiographer, and all computer-based reports require physician overreading.”ⁱⁱⁱ It was readily apparent to the Internal Medicine team and confirmed by the reviewing Cardiologist that the EKG was in fact a normal sinus rhythm, with the p-waves not being picked up by the computerized algorithm. For this gentleman, seemingly benign pre-operative testing led to significant anxiety and an unnecessary admission with the resultant increased costs to the patient and healthcare system. One could also speculate that perhaps his surgeon did not want to proceed with the surgery after a ‘curbside’ consultation with this ECG interpretation “on the books” in case something was to happen during the surgery, without formal consultation and review of the EKG. No further pre-operative testing was performed and the patient underwent his sigmoidectomy the next day, without complication.

References:

ⁱ Kristensen SD, Knuuti J. New ESC/ESA Guidelines on non-cardiac surgery: cardiovascular assessment and management. *Eur Heart J* 2014; 35:2344.

ⁱⁱ Fleisher LA, Fleischmann KE, Auerbach AD, et al. 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation* 2014; 130:2215.

ⁱⁱⁱ Kligfield P, Gettes LS, Bailey JJ, et al. Recommendations for the standardization and interpretation of the electrocardiogram: part I: The electrocardiogram and its technology: a scientific statement from the American Heart Association Electrocardiography and Arrhythmias Committee, Council on Clinical Cardiology; the American College of Cardiology Foundation; and the Heart Rhythm Society: endorsed by the International Society for Computerized Electrocardiology. *Circulation*. 2007 Mar 13;115(10):1306-24.