MI but a Clean Cath?

Nissen, Steven. “Application of intravascular ultrasound to characterize coronary artery disease and assess the progression or regression of atherosclerosis.” *American Journal of Cardiology* 2002; 89(2): 24B-31B.

**Key Points:**

- Gold standards can be misleading
- Use all tests help you refine your clinical decision-making from pre-test to post-test probability
- “Clean cath” is not a valid Pubmed search term

**The Gold Standard**

- Angiography: gold standard for noninvasive tests for CAD
  - Limits: can underestimate disease severity, interobserver variability, comparisons with diseased reference diameters in other vessels
  - Quantitative angiography: greater predictive physiologic significance
- Posttest referral bias
  - True-positive or false-positive noninvasive test results (not true negative) -> angiography
  - Normalcy rate as surrogate for specificity: % of normal scans in patients who have <5% posttest likelihood of CAD with pre-cath data (should be considered with all new tests)
- New tests: highly selected patient populations (normal volunteers or severely diseased patients) - > higher sensitivities and specificities for any new tests

**Elevated troponin or myocardial infarction with angiographically normal coronary arteries**

- Prevalence: 3% among those with MI; up to 10-15% of those undergoing angiography with suspected CAD
- Varies by age (10% under age 35), prior lysis, timing of cath, definition of MI / troponin elevation
- Data is limited, but suggests better prognosis
- Recognized associations with troponin elevation:
  - MI – thrombotic, embolic, spasm, microvascular
  - Pulmonary embolus
  - Severe CHF
  - Direct injury to the heart (trauma, ablation, cardiac surgery, defibrillation)
  - S/P percutaneous coronary intervention
  - Viral infection / myocarditis
  - Pericarditis
  - CVA
  - Tachycardia with hemodynamic compromise
  - Sepsis
  - Toxins (cocaine, adriamycin, 5-FU)
  - Heterophile antibodies (RA)
  - Renal impairment
  - Prolonged strenuous endurance exercise
- Da Costa (France):
  - AMI (chest pain, ECG changes, raised plasma enzymes -> not more strictly defined)
  - With normal angiogram (<50% stenosis) at 6.2 +/- 4 days (1-15)
  - 91 patients: 34 female, 57 male, mean age 50+-13 (24-78); 71 prospectively studied, matched with 91 patients with stenosis (>50% stenosis)
    - Coronary spasm 15.5% (70% reduction of diameter using ergonovine maleate)
    - Congenital coagulation disorders 12.8% (C, ATIII, Factor V Leiden)
    - Collagen tissue disorders 2.2%
    - Embolization 2.2%
    - OCP 1.1%
  - Compared with pts with stenosis: higher EF (60 vs 55%, p=0.04), higher event-free survival (75 vs 50%), no significant difference in survival (94.5 vs. 92%)
  - Predictors of events (death, reinfarction, CHF, stroke): EF, age, DM, smoking
- IVUS: plaque size, distribution, composition; less dependent on 2D view / angle; remodeling may disguise plaqued vessel with preserved luminal diameter
  - Some studies show luminal irregularities in 36% of patients with normal angiograms and suspected CAD (not necessarily defined by prior MI)
  - No outcomes-based research demonstrating worse prognosis for disease only by IVUS
  - Used peri-PCI to define high-risk lesions, confirm angiographic estimates, evaluate post-stent