

Asymptomatic Patients With Suspected Coronary Artery Disease: What Are Clinicians Afraid Of?

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Introduction

In contemporary practice, myocardial revascularization, particularly Percutaneous Coronary Intervention (PCI), is frequently performed in asymptomatic individuals with suspected Coronary Artery Disease (CAD). This occurs despite robust evidence from Randomized Clinical Trials (RCTs) over the past two decades demonstrating that, in patients with Chronic Coronary Syndromes (CCS), neither PCI nor Coronary Artery Bypass Grafting (CABG) reduces mortality when compared with Guideline-directed Medical Therapy (GDMT).¹ In selected populations, revascularization confers symptomatic relief, particularly among patients with frequent angina, but without prognostic advantage.²

The persistence of invasive strategies in asymptomatic patients appears to be driven largely by two cognitive biases: the “oculostenotic reflex”, the impulse to correct angiographically visible stenoses, and the “oculoischemic reflex”, the perceived need to revascularize documented ischemia irrespective of symptoms. Both are rooted in the fear that untreated coronary obstructions inevitably herald sudden cardiac death or Acute Myocardial Infarction (AMI).^{3,4}

This brief review examines the evidence regarding screening and revascularization in asymptomatic patients and discusses why these strategies fail to improve clinical outcomes.

Overdiagnosis and Overtreatment

Current guidelines from the American College of Cardiology and the American Heart Association advise against routine preoperative noninvasive testing before noncardiac surgery unless the results are likely to influence management.⁵ However, registry data from the United States show that most preoperative cardiac catheterizations are done in asymptomatic patients, with revascularization suggested in nearly a quarter of cases.⁶ Importantly, the randomized trial by McFalls and colleagues found no reduction in mortality or myocardial infarction with prophylactic revascularization before major vascular surgery.⁷

Keywords

Coronary Artery Disease; Acute Coronary Syndrome; Percutaneous Coronary Intervention; Risk Factors

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Appropriateness analyses further highlight this issue. In a nationwide U.S. registry encompassing over 1.2 million PCIs performed in stable CAD, approximately one quarter were classified as rarely appropriate.⁸ A substudy of the ISCHEMIA trial reinforced these findings, showing that anatomical complexity (number of diseased vessels, SYNTAX score, proximal left anterior descending involvement) and diabetes did not identify subgroups deriving incremental prognostic benefit from an initial invasive strategy. Rather, baseline symptom burden and antianginal therapy were the principal determinants of health-status improvement.⁹

The Myth of Imminent Catastrophe

The belief that asymptomatic ischemia predicts sudden death remains deeply ingrained in clinical culture. However, in ISCHEMIA, the annual incidence of sudden cardiac death among patients with moderate-to-severe ischemia treated conservatively was approximately 0.4%.^{10,11} Furthermore, although spontaneous myocardial infarction occurred more frequently in the conservative arm, periprocedural infarctions in the invasive arm offset this difference, resulting in similar overall AMI rates at follow-up.¹⁰

Nearly four decades ago, Atilio Maseri observed that diagnostic and therapeutic decisions are often driven more by fear of death and infarction than by symptom relief. This observation remains pertinent.¹² Misinterpretation of the role of PCI in CCS — particularly conflating anatomical correction with prognostic benefit — likely underlies much of the current practice variation.¹³

Do Screening Tests Modify Prognosis?

A critical question emerges: how can a diagnostic test alter prognosis in asymptomatic individuals in the absence of a proven effective downstream intervention?

Noninvasive strategies — whether anatomical (coronary CT angiography) or functional (stress testing with imaging) — frequently increase rates of cardiac catheterization and revascularization without reducing hard clinical endpoints.

In the SCOT-HEART trial, CT angiography plus usual care was associated with a modest absolute reduction (1.6%) in the composite endpoint of cardiovascular death or nonfatal AMI compared with usual care alone.¹⁴ However, no reduction in all-cause mortality was observed. Furthermore, greater use of preventive therapies in the CT group raises concerns regarding treatment imbalance. The study's fragility index further suggests limited statistical robustness.¹⁵

Conversely, the PROMISE trial, which randomized over 10,000 patients to anatomical versus functional testing strategies, demonstrated no difference in major cardiovascular

outcomes between approaches.¹⁶ Similarly, the FACTOR-64 trial found no reduction in death, AMI, or unstable angina hospitalization among asymptomatic diabetic patients screened with CT angiography compared with usual care.¹⁷

At the population level, the Danish DANCAVAS study, which screened more than 46,000 community-dwelling men for multiple cardiovascular conditions, including CAD, found no mortality reduction after more than five years of follow-up.¹⁸

Collectively, these data indicate that screening asymptomatic individuals for CAD does not translate into improved survival or reduced myocardial infarction rates.

The Central Role of Risk Factor Control

While screening and revascularization have not demonstrated prognostic benefit in asymptomatic individuals, intensive risk factor modification has consistently shown a durable impact.

A substudy of the COURAGE trial revealed a striking gradient in long-term outcomes: after 14 years, mortality was 8% among patients who achieved control of all major risk factors compared with 28% among those who controlled none.¹⁹ Similarly, analyses from ISCHEMIA demonstrated that attainment of comprehensive GDMT targets — systolic blood pressure < 130 mmHg, LDL cholesterol < 70 mg/dL, smoking cessation, and antiplatelet therapy — was associated with a 16-percentage-point absolute reduction in cardiovascular death or myocardial infarction over four years (number needed to treat < 7).²⁰

These findings emphasize that prognosis in stable CAD is determined less by focal coronary stenoses and more by systemic atherosclerotic burden and its modifiable determinants.

Conclusion

Current evidence does not support routine noninvasive or invasive testing for CAD in asymptomatic individuals, nor does it justify revascularization in the absence of limiting symptoms. The fear of sudden death or infarction from untreated stenoses is not substantiated by contemporary randomized data.

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Clinical management should instead prioritize aggressive risk factor modification and adherence to guideline-directed medical therapy. Future research should focus on refining risk stratification tools and identifying subgroups, if any, that may derive prognostic benefit from targeted interventions. Until such evidence emerges, restraint in testing and intervention represents not therapeutic nihilism, but evidence-based care.

Author Contributions

Conception and design of the research, acquisition of data and statistical analysis: Rocha ASC; analysis and interpretation of the data, writing of the manuscript and critical revision of the manuscript for intellectual content: Rocha ASC, Kruczan D.

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Use of Artificial Intelligence

The authors did not use any artificial intelligence tools in the development of this work.

Data Availability Statement

All datasets supporting the results of this study are available upon request from the corresponding author.

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