while awaiting surgery, for aiding postsurgical recovery, or for providing a bridge to more advanced durable heart failure therapies if the presentation is late and the infarct has completed with no added benefit for revascularization.

In summary, delaying CABG in an effort to reduce the risk of bleeding or to allow for a “cooling-off” period after STEMI is governed by imperfect science and driven primarily by patient-related factors and surgical judgment. If the clinical scenario mandates emergency surgery (day 1), then the risks are high and likely unavoidable. On the other hand, if waiting is a viable option, then there is nothing magical about waiting until day 2, day 3, or any other day for that matter. It is about balancing the risk:benefit ratio, which varies from one case to another.

See Article page 672.

Commentary: The times they are a-changin': Coronary artery bypass grafting following acute ST-elevation myocardial infarction

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Acute ST-elevation myocardial infarction (STEMI) is a common indication for emergency room visits and hospitalization in the United States.¹ Percutaneous coronary intervention (PCI) is the therapy of choice to rapidly restore blood flow and reduce infarction volume. Coronary artery bypass grafting (CABG) is a less frequently used modality of reperfusion and is reserved for patients with multivessel disease, left main disease, and post-myocardial infarction complications. Urgent CABG is recommended as rescue therapy after complicated or failed PCI when patients are experiencing ongoing ischemia and cardiogenic shock.² Despite these

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CENTRAL MESSAGE

Using the largest inpatient database in the United States, the authors report changes in trends in the surgical timing and management of acute ST-elevation myocardial infarction over the past 20 years.

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Disclosures: The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication April 1, 2021; revisions received April 1, 2021; accepted for publication April 5, 2021; available ahead of print April 20, 2021.

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J Thorac Cardiovasc Surg 2023;165:685-2

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2021.04.004>

recommendations, no consensus exists to dictate the optimal timing after presentation to perform surgery.

In this issue of the *Journal*, Elbadawi and colleagues³ report changes in trends over the past 20 years for the surgical management of acute STEMI. The authors conducted a retrospective review of the National Inpatient Sample (NIS) database, which represents 20% of annual hospitalizations in the United States. Their analysis spanned from 2002 to

2016 and included 251,240 patients who underwent isolated CABG following acute STEMI. The authors found that the rate of use of isolated CABG after acute STEMI decreased from 9.2% in 2002 to 5.5% in 2016 ($P < .001$). As expected, the use of PCI and mechanical circulatory support (MCS) before CABG has increased significantly since 2002. The authors also found that most CABG procedures were performed on hospital day ≥ 3 , but with a rising trend toward performing CABG on hospital day 2. Although no changes in in-hospital mortality were found over the course of the 20-year study period, there were higher rates of in-hospital mortality on day 1 (7.1%) versus day 3 (7.1% vs 3.6%; odds ratio, 1.59; 95% CI, 1.42-1.78).

Elbadawi and colleagues shed light on the timing of CABG after acute STEMI by showing that patients who undergo CABG on hospital day 1 have a greater risk of mortality compared with patients who undergo surgery on hospital day 2 or ≥ 3 . A significant contributor to day 1 mortality is that patients who required immediate surgery had more comorbidities, putting them at an increased risk of death. The authors also found that the higher survival on subsequent days may have been affected by the use of MCS, which allows for a short period of preoperative stabilization to relieve ischemia. The trends found by the authors are generalizable, because the NIS database is the largest inpatient database in the United States and is well validated.^{4,5} The use of large databases is not without problems,

because they are susceptible to documentation and coding errors. In addition, research questions requiring granular data can be difficult to answer in large databases.

Fortunately, the authors were able to overcome these limitations, and they should be commended for a well-thought-out and well-executed study that provides some clarity on the important question of CABG timing after acute STEMI. In addition, their study will have a lasting impact, delineating the 20-year trend for PCI and CABG utilization after acute STEMI.

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