“You’re right, you’re right, I know you’re right”

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Central Message

For better risk stratification of those having reoperative surgery for radiation-induced valvular and coronary disease, more detailed information is needed to optimize appropriate therapy selection.

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In the classic romantic comedy movie *When Harry Met Sally*, when Sally accurately summarized Marie’s hopeless romantic future, stating that Marie’s married lover will not leave his wife for her, Marie replies fatalistically, “You’re right, you’re right, I know you’re right.” So, too, in their article in this issue of the *Journal* on radiation-induced valvular disease and reoperation, Ejiofor and colleagues¹ remind us once again about the perils of radiation and its adverse effects on the heart. Mantle and tangential radiation strategies for mediastinal tumors and breast cancer are remarkably effective tools in the cure of such diseases but are complicated by continued incessant tissue damage through many years, with patients presenting with cardiac disease on the average between 15 to 20 years after the original treatment.

The article of Ejiofor and colleagues¹ is a retrospective single-institution study of 261 consecutive patients with previous mediastinal radiation therapy who underwent either primary or reoperative valvular surgery with or without coronary operations between the year 2002 and May 2015. Ejiofor and colleagues¹ evaluated all patients for operative mortality, in-hospital complications, length of stay, and long-term survival, comparing results of patients undergoing reoperation with those undergoing primary operation alone. The predictable findings verified that patients undergoing reoperation had more comorbidities and a higher Society of Thoracic Surgeons score (5.21 vs 2.58; $P = .001$). Further, patients undergoing reoperation had longer intensive care unit and overall hospital stays (all $P \leq .001$), had more bleeding, consumed more blood products, and carried a higher operative mortality than did those undergoing primary operation (17% vs 3.7%; $P = .003$). The observed-to-expected Society of Thoracic Surgeons mortality ratios were 3.2 for reoperations and 1.4 for primary cases. Estimated overall survival of the patients undergoing reoperation was 55% at 10 years, whereas observed survival was significantly higher for patients undergoing primary operation (median, 9.5 years; 95% confidence interval [CI], 8.7-10.4 years) than for those undergoing reoperation (median, 5.7 years; 95% CI, 4.113-

7.6 years). Cox proportional hazards modeling revealed reoperative status (hazard ratio, 1.92; 95% CI, 1.15-3.22; $P = .013$), diabetes (hazard ratio, 2.14; 95% CI, 1.31-3.59; $P = .002$), and peripheral vascular disease (hazard ratio, 1.99; 95% CI, 1.17-3.40; $P = .012$) adversely affected survival, whereas the type of cancer, age, sex, preoperative renal insufficiency, preoperative history of stroke, congestive heart failure, and the type of procedure were not contributory.

The conclusions of the article reinforce the combined perils of radiation and reoperative cardiac surgery, each with its detrimental effects on cardiac function and postoperative survival. Ejiofor and colleagues¹ rightfully demonstrated an increased risk for reoperation in this group ($n = 47$), documenting increased right ventricular dysfunction, more complicated surgery, higher incidences of congestive heart failure and right coronary artery involvement, slightly lower left ventricular ejection fraction, and more peripheral vascular disease. They conclude that mediastinal radiation therapy and reoperation for valvular disease carry a higher risk than predicted by Society of Thoracic Surgeons modeling and, because of the significant difference in outcomes, have raised the question of whether transcatheter aortic valve replacement (or heart transplant) might be a better future consideration in this population because of the insidious ongoing damage that can occur in an extended period.

Unfortunately, the reader is left with an observational truth, radiation and reoperation for valvular disease are

combined insults to patients that produce worse outcomes than do primary operations. In keeping with my analogy from *When Harry Met Sally*, however, we later learn that Marie does form a most romantic relationship with Harry's friend, Jess, disproving her original pessimistic premise that her only chance for love was a married man leaving his wife, ultimately ending in her loneliness. Marie's original statement, "You're right, you're right. I know you're right," was in fact true but, in the end, misleading. Ejiofor and colleagues¹ made a similar mistake in assuming that the facts (preoperative conditions that they examined) proved the observational conclusion that reoperation in the face of previous mantle or tangential radiation carried worse short- and long-term outcomes. They failed to provide the reader with the more important details for a better understanding of the reasons for the results and, more importantly, how to improve our risk stratification process to benefit patients

being considered for operation or some other treatment. In the end, type of radiation, targeted dose of the treatment, specific measurements of right ventricular systolic and diastolic function, tricuspid valve disease, and the influence of postoperative atrial fibrillation (to name a few) need to be examined and detailed if we are better to objectify the risk profile of patients with radiation-induced valvular or coronary artery disease. Just as in the movies, "You're right, you're right, I know you're right"—but larger, more detailed studies are necessary to understand why and how this new information could benefit the comprehensive and better long-term treatment of these patients with this insidious disease.

Reference

1. Ejiofor JI, Ramirez-Del Val F, Nohria A, Norman A, McGurk S, Aranki SF, et al. The risk of reoperative cardiac surgery in radiation-induced valvular disease. *J Thorac Cardiovasc Surg*. 2017;154:1883-95.