Is the Burden of Incomplete Revascularization Following Coronary Artery Bypass Grafting (CABG) Increasing Over Time?

Chase R. Soukup, Benjamin C. Sun MD, Carmen K. Chan-Tram MS, CCRP, Christian W. Schmidt MS, Jay H. Traverse MD
Minneapolis Heart Institute Foundation at Abbott Northwestern Hospital, Minneapolis, Minnesota

ABSTRACT

Background: Up to 50% of patients undergoing coronary artery bypass grafting (CABG) may experience incomplete revascularization. It is associated with a 35% increase in long-term mortality, a 22% increase in myocardial infarction, and a 26% increase in repeat revascularization (Garcia S et al, JACC, 2013). Incomplete revascularization is an important potential target for new therapies. Therefore, the rates and causes of incomplete revascularization need to be better understood.

Methods: A retrospective review of consecutive patients who underwent elective and isolated CABG for multivessel coronary artery disease (CAD) at the Minneapolis Heart Institute at Abbott Northwestern Hospital was performed. Patients who underwent CABG in a contemporary time period (2017) were compared to patients who underwent CABG in a historical time period (2007). Operative findings, cardiopulmonary bypass, and CABG operative reports were reviewed in order to determine completeness.

Revascularization was considered complete when all major epicardial vessels and their major branch vessels (≥2 mm) were bypassed either directly or indirectly via perfusion from a neighboring vessel. The completeness of the revascularization that was exact was used where appropriate for demographic comparisons. Patients with completeness of revascularization that were used for age and use revascularization index score.

Results: From January 2006 to December 2017, 151 patients underwent elective and isolated CABG. In the historical time period, 19 (13%) operations were classified as incomplete revascularization. In 2017, 105 patients underwent elective and isolated CABG. In the contemporary time period, 49 (25%) operations were classified as incomplete revascularization. This constitutes a relative increase of 101% in incomplete revascularization (12.6% vs. 25.4%; P < 0.003). The patient base in the contemporary time period was older (86.9 ± 10.8 vs. 83.3 ± 4.4; P = 0.023) in addition to being comprised of a larger proportion of males (73.4% vs. 65.5%; P = 0.03). There were more diabetics in the contemporary period (30.5% vs. 22.6%; P = 0.075). In addition to the incidence of incomplete revascularization increasing, the RIS for each cohort decreased from 0.96 to 0.91 over the 10-year period (P = 0.021).

Conclusions: The incidence of incomplete revascularization following CABG significantly increased over the ten-year period between 2007 and 2017. Potential reasons for the increase in incomplete revascularization may be related to patient factors resulting in more severe coronary artery disease including older age and greater incidence of smoking and diabetes. The historical cohort exhibited a greater percentage of cardiac mortality in patients with incomplete revascularization.

CONTACT

Chase Soukup
Email: chase.soukup@allina.com
Phone: (612) 756-4440

TABLE 1: Patient Characteristics by Historical and Contemporary Time Period

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Incomplete Revascularization Overall (n=344)</th>
<th>Complete Revascularization (n=207)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
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<td>33 (25)</td>
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<td>2017</td>
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DISCLOSURES

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ACKNOWLEDGEMENTS

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Figure 1: Incomplete Revascularization in the Historical vs. Contemporary Time Periods

Figure 2: Coronary Angiogram

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Table 2: Incomplete Revascularization Patient Characteristics by Time Period

Figure 1: Operative Findings Heart Diagram

Figure 2: Coronary Angiogram

METHODS

- Population

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CONCLUSIONS

- The incidence of incomplete revascularization following CABG significantly increased over a 10-year period between 2007 and 2017.
- Potential reasons for the increase in incomplete revascularization may be related to patient factors, resulting in more severe coronary artery disease including older age and greater incidences of smoking and diabetes.
- The historical cohort exhibited a greater percentage of cardiac mortality in patients with incomplete revascularization.