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Breast Arterial Calcification— At the Heart of Screening: A Canadian Perspective

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Introduction

Cardiovascular disease remains the primary cause of mortality in Canadian women, with deaths from adverse cardiac events rising in women over the past 5 decades.¹⁻³ Despite recent advances in cardiac care, the current methods used for cardiovascular risk stratification underestimate cardiovascular risk in women,^{4,5} and there is an ever-increasing need for a system that considers sex-specific risk factors in addition to traditional cardiovascular risk factors.

Just as there are sex-specific cardiovascular risk factors for women that differ from traditional cardiovascular risk factors, men and women experience different signs and symptoms of acute coronary syndrome. Women with myocardial infarction are more likely to present with atypical symptoms such as gastrointestinal upset rather than typical retrosternal chest pain triggered by exercise and relieved with rest.^{6,7} Despite this fact, the majority of Canadian women are unaware of their personal cardiovascular risk and factors that influence their risk for adverse cardiac events.^{2,8} By reporting breast arterial calcification (BAC) found on mammography, radiologists can add value to patient care by identifying women at higher cardiovascular risk, allowing for earlier preventive measures.

Clinical Importance of Breast Arterial Calcification

Evidence of the association between the presence of BAC on mammography and increased cardiovascular risk, and the development of clinically significant heart disease, is growing.⁹⁻¹⁴ Patients with BAC have been found to have an increased incidence of critical coronary artery stenosis and are more likely to develop ischemic heart disease or ischemic stroke compared with those without BAC on mammography, even when controlling for age.^{15,16}

Despite some evidence to the contrary,^{17,18} an ever-increasing volume of studies are finding a correlation between BAC and coronary artery disease. These newer studies, which are being performed prospectively on larger cohorts, are providing stronger evidence of the clinical significance of BAC.^{19,20}

While many authors caution against using BAC as a diagnosis of cardiovascular disease or to justify invasive testing, supporters of BAC reporting, including The Canadian Society of Breast Imaging, note that the findings should prompt conversations between women and their health care providers about preventative care.²¹

Current Perceptions and Practice

Reporting of BAC among radiologists is inconsistent across North America. In Canada, although 50% of radiologists are aware of the relationship between BAC and cardiovascular risk, only 16% routinely report its presence on mammography.²² One-third report the presence of BAC when it is found in young patients or if the calcium burden is high.²² Of those who report BAC, only 4% follow-up or offer management recommendations, and even fewer (only 1%) directly inform the patient.²² With only 4% of radiology departments having established protocols for reporting BAC, it is widely agreed that national guidelines are needed.²²

In the United States, up to 87% of radiologists report BAC on mammography; however, only 15-41% do so consistently,^{23,24} and fewer than half agree that identification of BAC adds value to screening mammography.²⁴ Of the radiologists who routinely report BAC, only 0.7% consistently provide follow-up recommendations.²⁴

Results of North American survey studies suggest that referring physicians would like to be made aware of the presence of BAC on mammography.^{25,26} Furthermore, an overwhelming majority of patients surveyed in a 2020 study by Margolies et al indicated that they wanted to be made aware of the presence of BAC on mammography in order to guide informed decision-making.²⁷ Approximately 22% of the those patients were familiar with BAC prior to taking the survey.²⁷ In a 2023 study by Vincoff et al, 57% of patients who were notified about BAC on their mammogram had discussed the results with their physician within 3 months, and 81% said that direct notification of the presence of BAC was “very helpful” or “somewhat helpful.”²⁸ In a 2025 prospective cohort, McKee et al reported that informing patients without known cardiovascular disease about BAC and coronary artery calcium on calcium score CT led to increased primary care follow-up and lifestyle changes.²⁹

Practical Considerations

While there is limited evidence on when and how to meaningfully report BAC, the Canadian Society of Breast Imaging has published a grading system and reporting guide to support radiologists.²¹ There are geographic barriers to BAC reporting in some provinces and territories. For example, the standard reporting templates utilized by some screening programs do not currently allow for free text; adding a free-dictation text box or equivalent could facilitate nationwide BAC reporting.²²

Discussion on the reporting and clinical management of BAC on mammography is not complete without acknowledging the potential impact of widespread reporting on an already-stretched Canadian health care system. An increase in administrative burden and unnecessary referrals can be avoided with coordination and clear communication among radiologists, family physicians, cardiologists, and oncologists surrounding the reporting and management of BAC. The decision to report BAC on mammography should be made in partnership with regional referring physicians to mitigate capacity issues resulting from increased cardiology referrals.

For patients in whom BAC is identified on mammography, the primary recommendation is that the referring physician and/or family physician assess the patient's cardiovascular risk factors and optimize primary or secondary preventative methods. This may encompass lifestyle modifications such as increased physical activity, dietary adjustments, decreasing alcohol consumption, and smoking cessation, in addition to initiation or adjustment of lipid-lowering medications and altered treatment thresholds for hypertension.

Conclusion

Routine reporting of BAC on mammography is a powerful opportunity for radiologists to enhance patient care by identifying women at increased cardiovascular risk and enabling timely preventive interventions. With a significant overlap between postmenopausal women and those undergoing screening mammography, incorporating BAC reporting into standard practice can serve as a critical tool in early cardiovascular risk stratification. By facilitating the early initiation of optimal medical management, BAC reporting has the potential to significantly improve long-term health outcomes and drive greater awareness of cardiovascular disease prevention in women, ultimately transforming routine mammography into a dual-purpose screening tool for both breast and heart health.

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