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### Ultrasonographic Carotid Changes in Patients with Hodgkin's Disease after Radiotherapy: A Historical Cohort Study

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#### Abstract:

Background/objective: Radiotherapy is the most effective treatment for Hodgkin's disease in early stages. However, it can cause various side effects in radiated tissues, e.g., vascular structures. One of the effects of radiation on vessels is atherosclerosis. The primary objective of this study was to compare the atherosclerotic changes of carotid arteries, expressed as the mean intima-media thickness (IMT), in patients with Hodgkin's disease after radiotherapy with a matched non-exposed group. We also tried to see whether there is a correlation between the time elapsed since the last radiotherapy session and the prevalence and severity of atherosclerosis. Moreover, we tested if radiation can augment the effect of age, as an in-dependent risk factor for atherosclerosis. Patients and Methods: In two groups of 50 patients, sonography of the common and internal carotid arteries in bifurcation of the artery was performed and the IMT was measured for both groups of patients exposed and unexposed to radiation. Results: The mean±SD IMT was significantly higher in exposed ( $0.67\pm 0.22$  mm) than unexposed ( $0.51\pm 0.07$  mm) group. There were early atherosclerotic changes, diagnosed based on the vessel morphology, in 18% of exposed and none of the unexposed group. Correlation of IMT with age is stronger in the exposed than in the unexposed group. ( $r=0.61$  in the exposed vs.  $0.22$  in the unexposed). Conclusion: Atherosclerotic changes are more prevalent in post-radiotherapy patients that may indicate the necessity of regular and careful follow-up of these patients for the early diagnosis of vascular pathologies and considering suitable screening and therapeutic interventions for prevention of cerebral complications. Ultrasound could be a suitable technique for screening and early detection of atherosclerosis considering its relatively low cost and non-invasiveness.

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