Title: The prevalence and risk factors of thoracic aortic dilatation detected incidentally in adjuvant radiotherapy planning CT scans in patients with breast cancer

Authors:
MBBS Aada Lattu1,2 , PhD, MD Petteri Kauhanen3, Docent, MD Ari Mennander4 , Professor, MD Marja Hedman3,5,6 , Docent, MD Irina Rinta-Kiikka1,2 , Docent, MD Tanja Skyttä1,7 , Docent, MD Otso Arponen1,2

Keywords:
thoracic aortic dilatation, breast cancer, incidental findings, radiotherapy, computer tomography

Abstract

Background: Thoracic aortic dilatations (TADs) are commonly detected incidentally and can develop into aortic aneurysm, potentially leading to life-threatening aortic dissections. Early detection could lead to surgical intervention, if needed, reducing the risk of lethal complications. Thoracic sectional imaging studies performed for other indications, including breast radiation therapy planning, could be readily used to detect TADs. The prevalence and risk factors of TADs in females undergoing adjuvant breast radiation therapy remains unestablished.

Methods: We collected retrospectively a consecutive cohort of 861 female patients with breast cancer who underwent adjuvant radiotherapy planning with computed tomography (CT). We manually measured thoracic aortic dimensions on the hospital's dedicated picture archiving and communication (PACS) software. Following the European Society of Cardiology guidelines, a segment of the aorta was defined dilated when its maximal diameter exceeded 4.0 cm. Clinical patient data regarding known risk factors predisposing patients to TADs were also collected.

Results: 80 (9.3%) patients had TAD. Compared to those without any TAD, patients with TAD were older (71.3 ± 9.7 years vs 62.9 ± 11.7 years; P < .001) and had more often hypertension (62 (77.5%) vs 354 (45.3%), P < .001), a history of TIA or stroke (10 (12.5%) vs 36 (4.6%), P = .007), and had aortic valve regurgitation (10 (12.5%) vs. 51 (6.5%), P = .047).

Conclusions: Opportunistic use of planning CT scans allows a window-of-opportunity for earlier diagnosis of TADs. The findings may indicate the need to consider a systematic screening of TADs in patients undergoing adjuvant radiotherapy.