



Coronary Artery Disease Association with Arterial Calcifications on Hand Radiographs

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Introduction

Arterial calcifications have been linked with an increased risk of coronary artery disease (CAD) and attendant comorbidities. Few studies have evaluated if the frequency and impact of upper extremity calcifications remains similar to that demonstrated in the lower extremity or cardiac vessels. Our study examines if a correlation exists between CAD and the presence of arterial calcifications on routine hand radiographs.



Figure 1. 66-year-old male non-smoker with history of CAD with calcifications of radial, ulnar, palmar arch, and digital arteries

Conclusions

Our data demonstrated that patients with CAD have a higher incidence of hand arterial calcifications on X-ray. Arterial calcifications seen on hand radiographs in the hand surgery patient population may warrant referral for further CAD diagnostic testing.

Methods

A retrospective review of 345 patients who presented to a single institution hand clinic with ICD-9 and ICD-10 diagnosis codes of CAD and who underwent plain radiograph of the hand were performed. All patients underwent CAD screening with cardiac stress testing or coronary angiography, which determined patients with CAD and patients without CAD. Patients with chronic kidney disease (CKD) or end-stage renal disease were excluded from primary analysis given the known confounder for arterial calcifications.

Results

The study patient population had a mean age of 71.8 years (r, 47-105), BMI of 28.8 (r, 15.7-45.6), and male gender of 55%. Ethnicity included Caucasian (82%), Black (8%), Hispanic (6%), and Asian (4%). Patients had comorbidities of hypertension (92%), hyperlipidemia (87%), diabetes (37%), smoking (53%), and stroke (8%).

Patients with CAD had a 40% (68/168) incidence of arterial calcifications on hand radiographs compared with 10% (6/61) of patients without CAD ($p < 0.0001$).

One-hundred sixteen patients with CKD were excluded from primary analysis, 75% (87/116) of whom had calcifications on hand x-ray.

Table 1

	(+) CAD (%)	(-) CAD (%)	p
N	168	61	
Age	72.4 ± 11.4	70.4 ± 11.7	0.13
BMI	29.0 ± 5.9	28.0 ± 5.0	0.13
Male	108 (64)	19 (31)	
Ethnicity			
Caucasian	138 (82)	49 (80)	0.75
Black	12 (7)	7 (11)	0.29
Hispanic	12 (7)	2 (3)	0.28
Asian	7 (4)	3 (5)	0.81
Calcifications	68 (40)	6 (10)	<0.0001
Comorbidities			
Hypertension	156 (93)	54 (89)	0.29
Hyperlipidemia	153 (91)	46 (75)	0.002
Smoking	93 (55)	29 (48)	0.29
Diabetes	70 (42)	15 (25)	0.02
Stroke	15 (9)	4 (7)	0.57