

## INTRODUCTION

- ❖ Coronary artery calcification (CAC) has been shown to be a very sensitive marker of atherosclerosis (1).
- ❖ However, non-calcified atherosclerotic plaque (NCP) does exist and can be missed on the coronary calcium scan, as demonstrated in recently published data (2).
- ❖ Certain cardiovascular clinical risk factors such as diabetes mellitus, hypertension, family history of premature coronary artery disease, dyslipidemia, and smoking have failed to show an increased risk for NCP (3,4).
- ❖ The prevalence of NCP has been shown to be higher in symptomatic patients in comparison to asymptomatic patients, and it has been suggested that younger males that smoke are more likely to have NCP (5).
- ❖ In this retrospective study, we aimed to describe the prevalence of NCP in a cohort of patients with a CAC score of zero who underwent coronary CT angiography at our center.
- ❖ Additionally, we also assessed the association of various risk factors with the presence of NCP in this population.

## METHODS

- ❖ We identified 181 patients with CAC score of zero amongst those who had 64-slice Multidetector cardiac computed tomography angiography (CCTA) performed between October 2006 and August 2008 at our center (Los Angeles Biomedical Research Institute at Harbor-UCLA) to rule out coronary artery disease.
- ❖ Data related to patient's cardiovascular risk factors, body weight and height were extracted through chart review from the questionnaire filled by them at the time of the procedure.
- ❖ For comparison of categorical variables between NCP absent versus present groups Chi-square test Odds Ratio was used.
- ❖ Continuous variables were compared using Student's t test.
- ❖ Binary logistic regression to determine association of body mass index (BMI) [categorized as per the NHLBI] categories with presence of plaque.
- ❖ For all analyses, criterion for statistical significance was set at a 2-tailed p value <0.05.

## RESULTS

The presence of NCP in patients with a zero CAC score was 13.8% (25/179).

Of the 25 patients, 92% had disease limited to one segment:

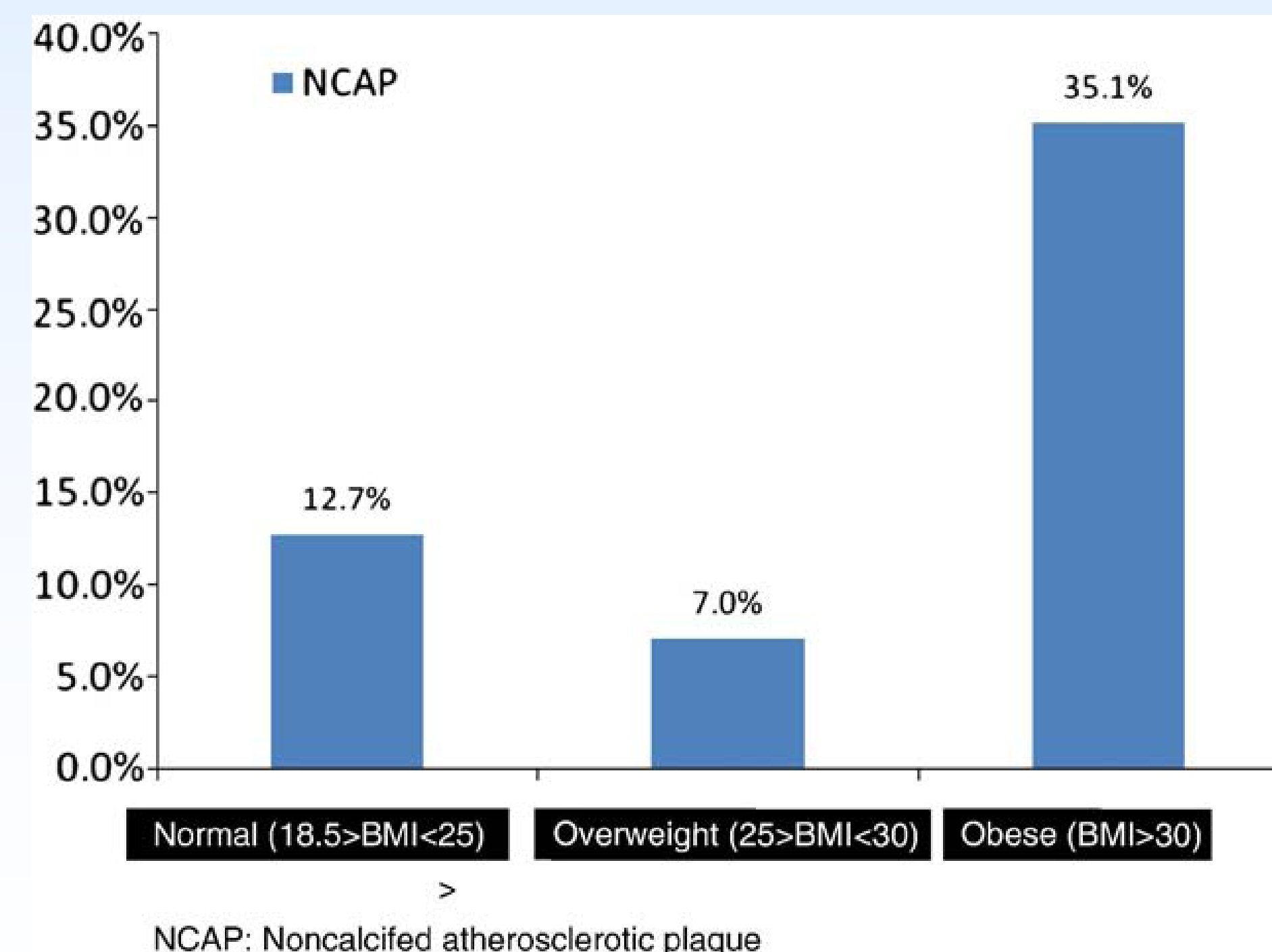
- 1) 76% had mild non-obstructive disease (< 30%).
- 2) Three had moderate non-obstructive disease (30-50%).
- 3) One patient (0.56%) had obstructive disease (stenosis >50%).

Two patients had disease limited to two segments, one with mild non-obstructive disease (<30%) and one with moderate non-obstructive disease (30-50% stenosis).

**Table 1.** Association of Non-calcified plaque in coronary arteries on CCTA with obesity.

	NCP Present No (%)	NCP Not Present No (%)	P Value
BMI (kg/m <sup>2</sup> )	27.6 (6.86)	31.5(8)	0.01
Wt (kg)	77.8 (19.2)	91.85 (23.98)	0.002
Ht (m)	1.67 (0.18)	1.71 (0.16)	> 0.05
Age (years)	52.2 (13.7)	50.4 (11.1)	> 0.05
Males	57.10%	44%	> 0.05
HTN	38.40%	40%	> 0.05
DM	10.40%	16%	> 0.05
DL	44.70%	44%	> 0.05
Smoker	6.90%	8.30%	> 0.05
Family history of coronary disease	52.60%	44%	> 0.05

BMI: body mass index, Wt: Weight, Ht: Height, HTN: Hypertension, NCP: Non-calcified atherosclerotic plaque, DM: Diabetes Mellitus, DL: Dyslipidemia.



**Fig. 1.** Association of Non-calcified plaque in coronary arteries on CCTA with obesity.

## DISCUSSION

- ❖ This study demonstrated for the first time that obese patients are 2.7 times more likely to have NCP, while no other associations with other risk factors was detected
- ❖ A study by Hausleiter et al reported a prevalence of 16% of NCP among patients with a CAC score of zero. His study did not find an association with BMI, but did find an association with higher total cholesterol, low density lipoproteins, and CRP (6)
- ❖ Our study used a larger population of 179 in comparison to 63 compared to the above mentioned study, however, blood cholesterol levels were not available in our population
- ❖ Cheng et al reported a prevalence of 6.5% with no associations of BMI or other risk factors (7). However, it was not clear in this study how many patients were obese or what the BMI range was for those with NCP.
- ❖ Our results call for a larger collaborative study to assess if the association we are reporting is truly reproducible, and if so, then to search for mechanisms that explain it.

## REFERENCES

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