

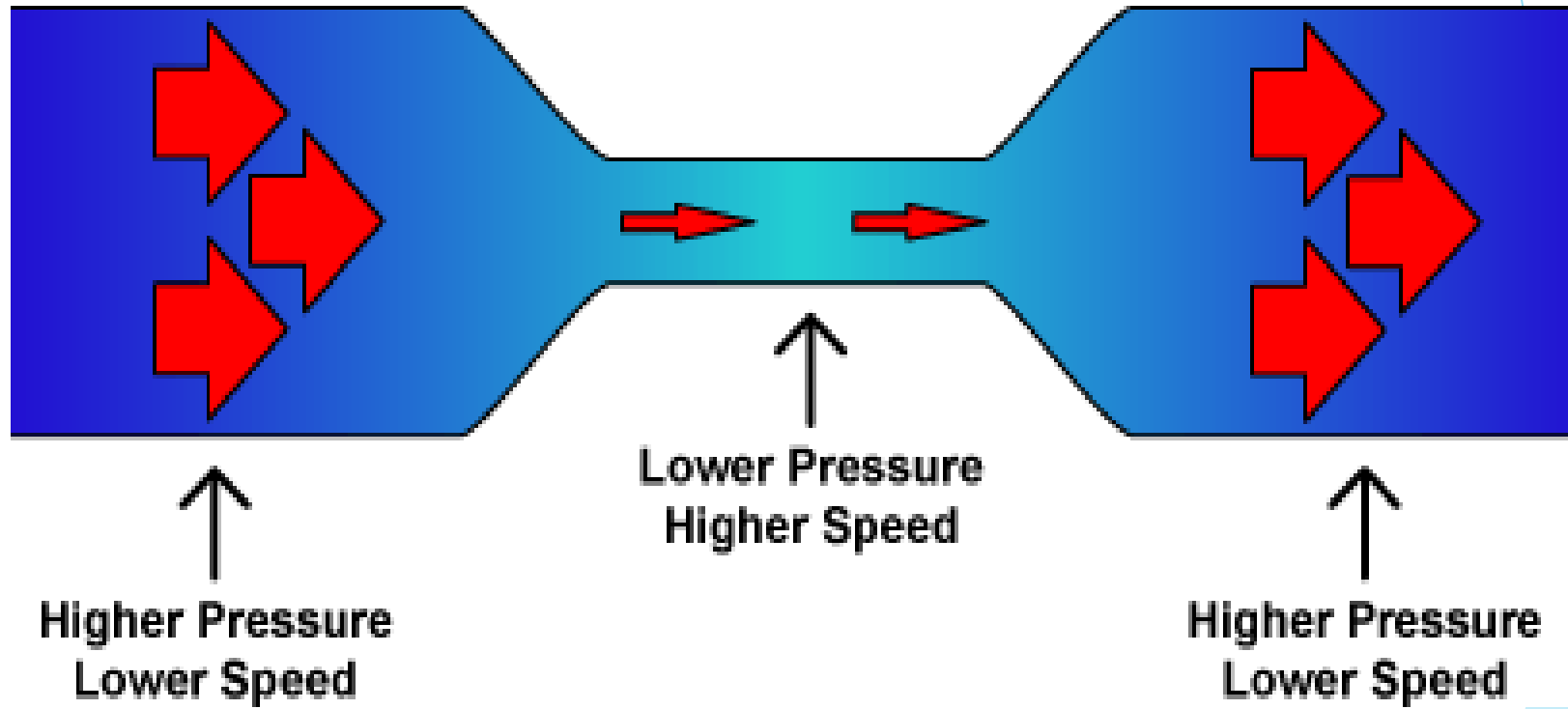
# A 75% stenosis created turbulent flow, ruptured bubbles, eroded the vulnerable cap and triggered acute myocardial infarction

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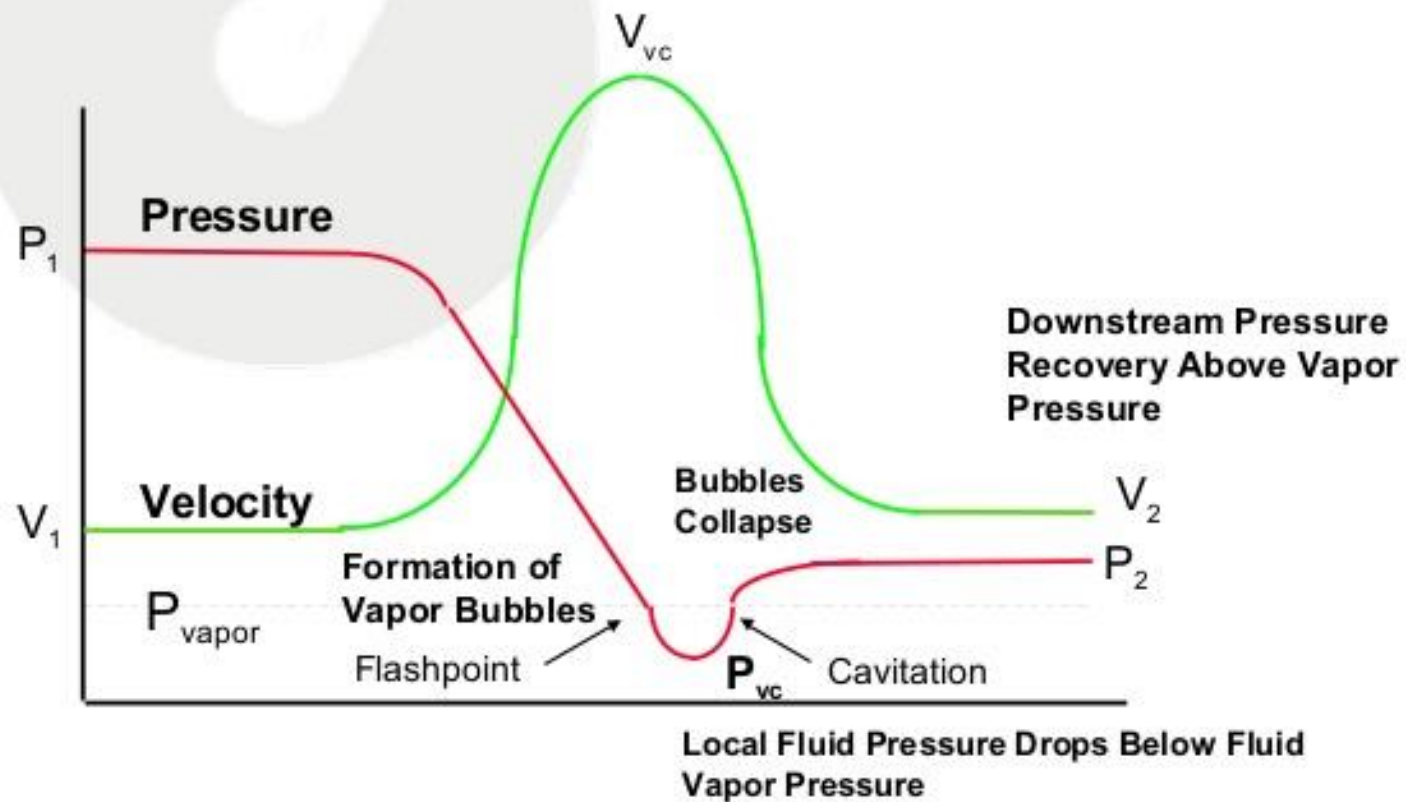
# Hypothesis

We found out that a 75% stenosis created turbulent flow, ruptured bubbles, eroded the vulnerable cap and triggered acute myocardial infarction.

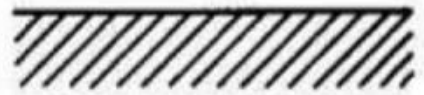
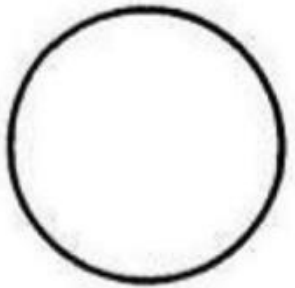


# Hydraulic principles

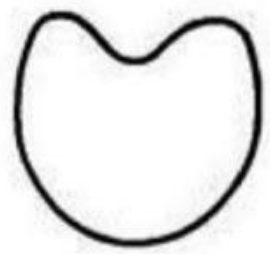
## Cavitation Phenomena



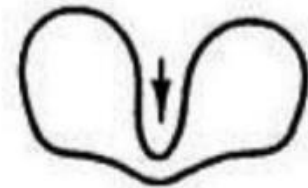
**FLOW DIRECTION →**



**Initial spherical  
bubble**



**Perturbation of  
side away from surface**

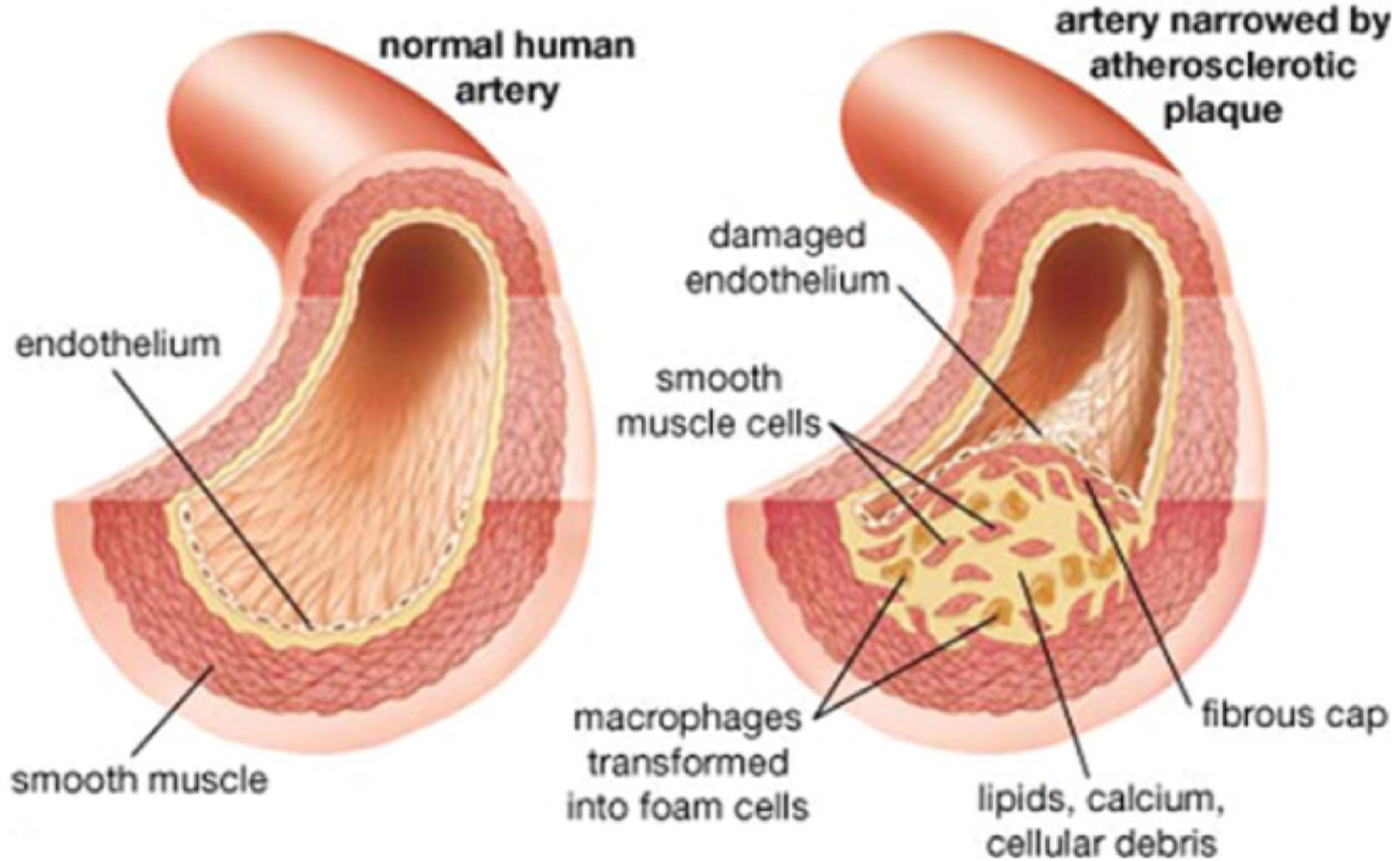


**Upper fluid penetrating  
flattened side**

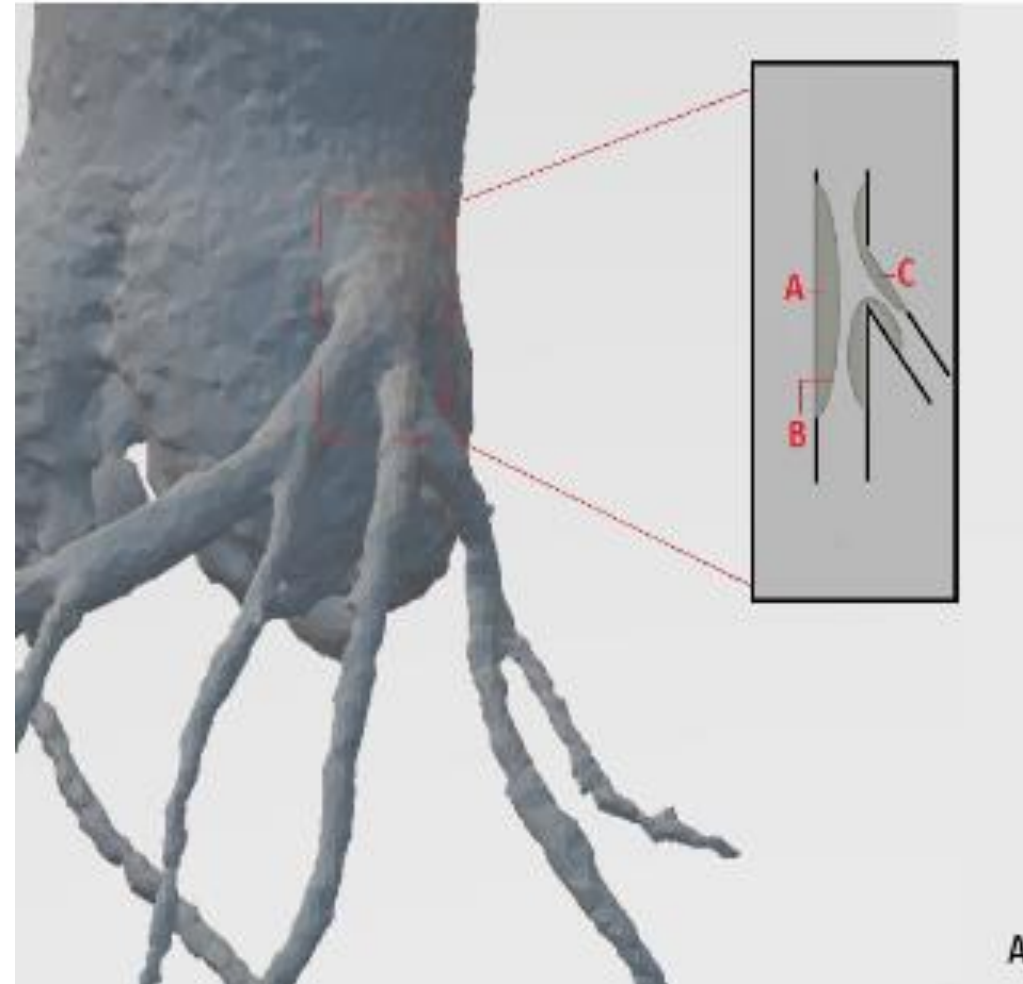


**Formation of jet**

# Atherosclerosis

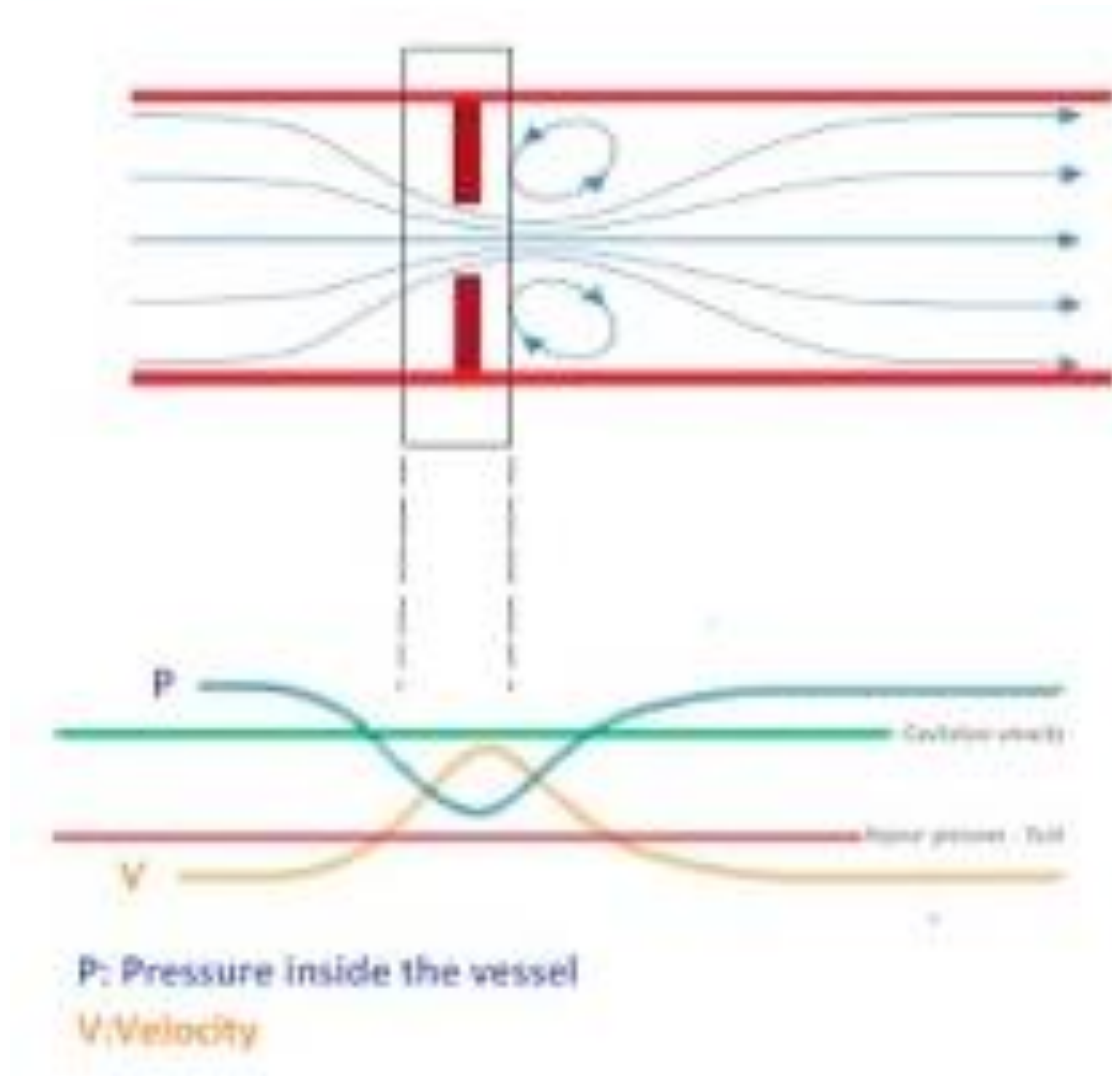


# Method



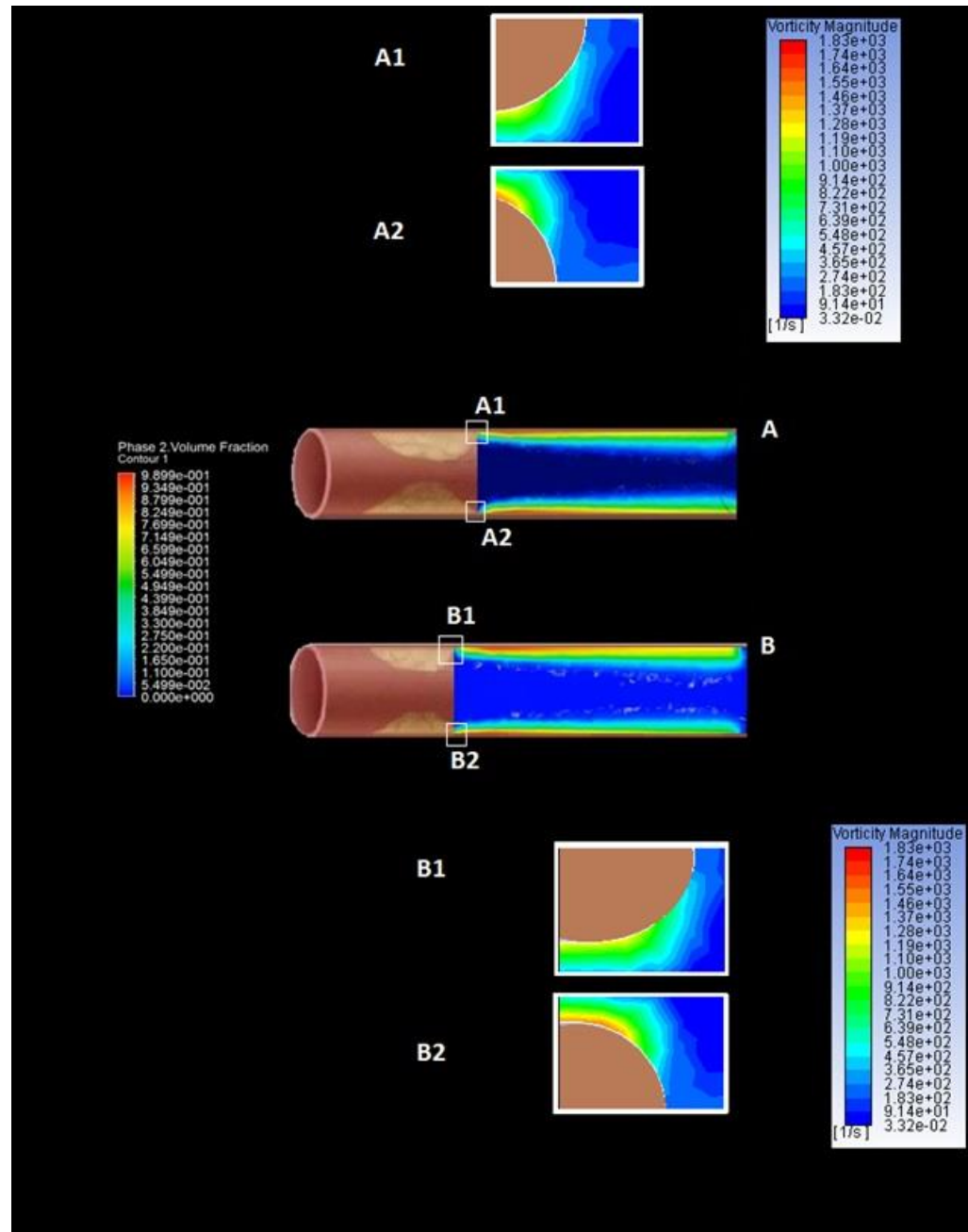
We reconstructed a 3D model of the left anterior descending coronary artery (LAD) after reviewing the intravascular ultrasound (IVUS) data of 30 consecutive patients with mild to severe coronary artery disease.

# Turbulent flow

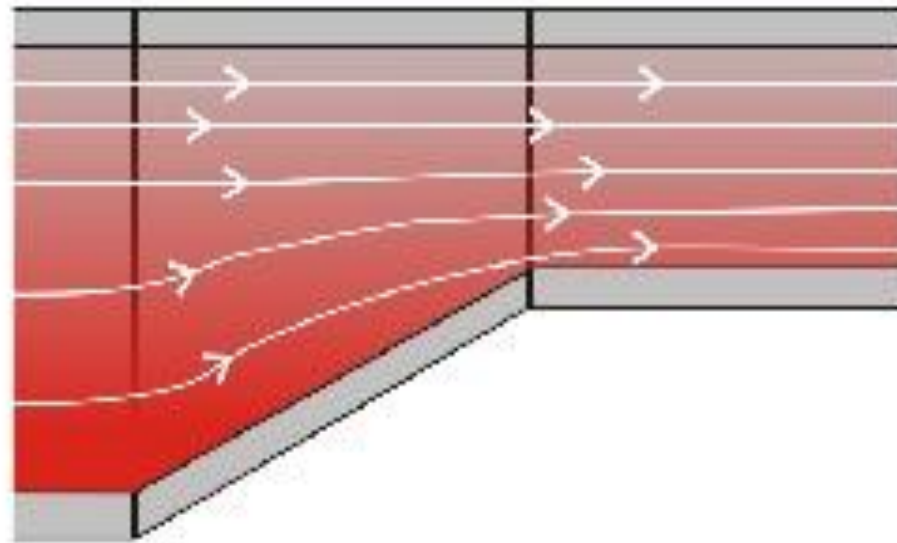
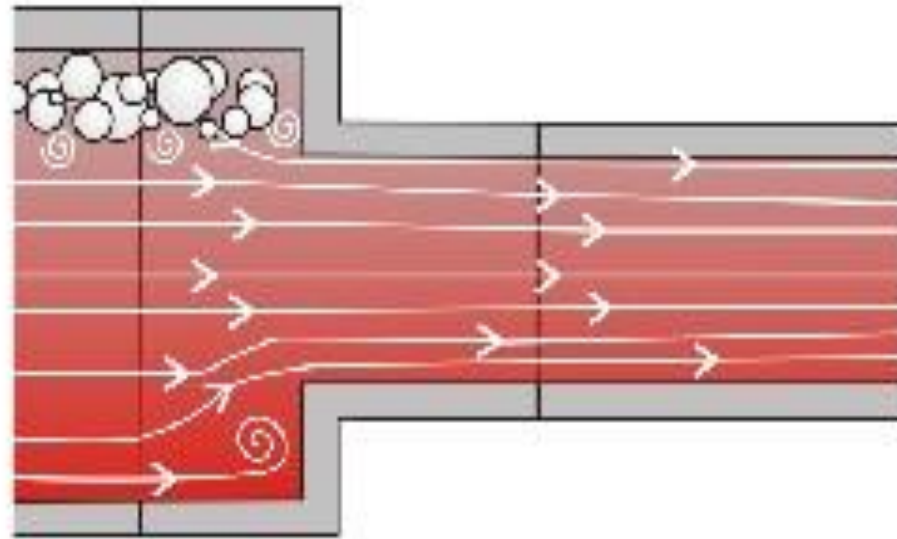




# Result



# Result



*Eccentric reducers eliminate air/vapour pockets and minimize friction*



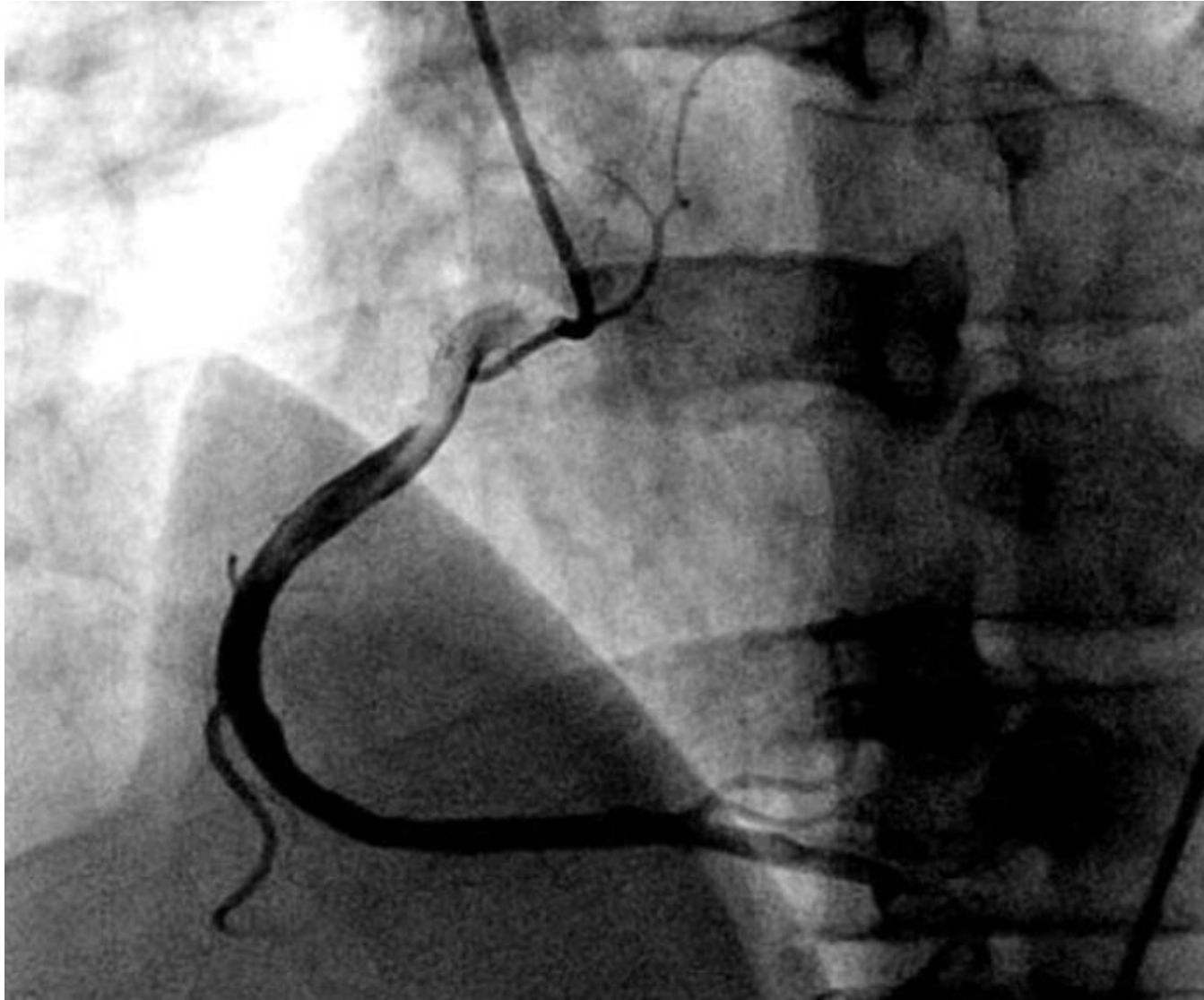
# Frame 26 flow laminar with a pointed tip



27 organized across the lesion: If the lesion is eccentric with an apex, the separation point is at the apex, then we see the stream line



28 turbulent at the proximal segment of the lesion. organized with eccentric tip If the lesion is eccentric with an apex, the separation point is at the apex, then we see the stream line



# Conclusion

Our new data found out that Cavitation (bubbles formation and rupture) in coronary vessels occurred when the concentric coronary stenosis reached **50%** and above while eccentric stenosis reach **75%**. These bubbles explosions eroded the cap, triggered platelet aggregation and started AMI.

Thank you for  
your attention