***Oral Presentation 3 - Title*: Exploring Acute Rapid Growth of Abdominal Aortic Aneurysms**

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Background: Abdominal Aortic Aneurysm (AAA) is defined as a dilation of the abdominal aorta ≥50% above its normal diameter. Ruptured AAAs are associated with a mortality rate of up to 90%, underscoring the importance of timely diagnosis and intervention. While much of the existing research focuses on long-term aneurysm progression, some patients experience acute, rapid enlargement. Known risk factors for growth include smoking, larger initial diameter, hypertension, and elevated inflammatory markers. Conversely, medications like metformin, statins, and beta-blockers may offer protective effects. However, factors contributing specifically to acute precipitation of AAA growth remain unclear.

Methods: We conducted a retrospective case-control study using patient data from Stony Brook University Hospital spanning 2010 to 2018. Patients were categorized based on the course of their AAA growth. Patients with any acute growth were characterized as fast-growing if aneurysm growth rate per year was ever ≥ 10% while slow growers had aneurysm growth rate <10%. Aneurysm size was determined through radiology reports (CT/ultrasound). Demographic, clinical, and treatment-related variables were extracted via PowerChart. Statistical analyses included t-tests, chi-square tests, two-proportion z-tests, and logistic regression.

Results: Among 545 AAA patients, 43 (7.9%) were classified as fast growers and 502 (92.1%) as slow growers. The average age was similar between groups (83.7 vs. 83.5 years). However, gender distribution differed significantly: fast growers were more likely to be female (41.9% vs. 25.1%, $p=0.017$). Chronic Kidney Disease (CKD) was more prevalent in fast growers (48.8% vs. 33.5%, $p=0.042$). Other comorbidities, including hypertension, coronary artery disease (CAD), chronic obstructive pulmonary disease (COPD), diabetes, and hyperlipidemia, did not show significant differences ($p<0.05$). Medication use patterns varied, with higher usage of beta blockers, calcium channel blockers, hydralazine, and insulin among fast growers, though none reached statistical significance.

Conclusion: Rapid acute growth of AAA appears to be more common among female patients and those with CKD. These findings highlight the need for further investigation into gender disparities and renal function in relation to AAA progression. Although other comorbidities and medication trends differed between groups, most were not statistically significant. Further stratified analysis of different stages of growers is needed to determine predictive factors for acute AAA expansion to better inform surveillance and intervention strategies.