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**Endovascular Treatment of Thoracic Aortic Dissection: Hemodynamic Shear Stress Study**[1] YIK SAU TANG, SIU KAI LAI, Department of Mechanical Engineering, University of Hong Kong, STEPHEN WING KEUNG CHENG, Department of Surgery, Li Ka Shing Faculty of Medicine, University of Hong Kong, KWOK WING CHOW, Department of Mechanical Engineering, University of Hong Kong — Thoracic Aortic Dissection (TAD), a life threatening cardiovascular disease, occurs when blood intrudes into the layers of the aortic wall, creating a new artificial channel (the false lumen) beside the original true lumen. The weakened false lumen wall may expand, enhancing the risk of rupture and resulting in high mortality. Endovascular treatment involves the deployment of a stent graft into the aorta, thus blocking blood from entering the false lumen. Due to the irregular geometry of the aorta, the stent graft, however, may fail to conform to the vessel curvature, and would create a "bird-beak" configuration, a wedge-shaped domain between the graft and the vessel wall. Computational fluid dynamics analysis is employed to study the hemodynamics of this pathological condition. With the 'beaking' configuration, the local hemodynamic shear stress will drop below the threshold of safety reported earlier in the literature. The oscillating behavior of the shear stress might lead to local inflammation, atherosclerosis and other undesirable consequences.

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