Rupture of Abdominal Aortic Aneurysm in the Low Wall Stress Zone

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An 81-year-old woman was admitted with back pain and a 68-mm abdominal aortic aneurysm (AAA). Intraoperatively, an area of imminent rupture was found at the left antero-lateral AAA wall (left image). A patient-specific geometric model of the AAA was created using CFDVasc software, which showed that the highest level of wall stress in the antero-lateral aortic wall was low (≤21.2 N/m²) (right image). This suggests that high levels of wall stress are not always related to the location and risk of AAA rupture. Both the quality of the aortic wall and the biochemical activity might play important roles.