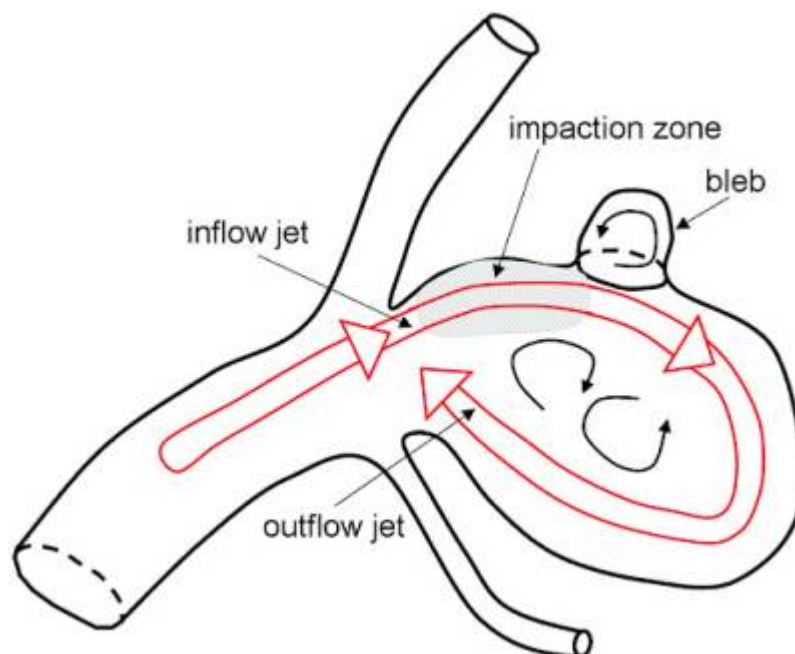


Aneurysm bleb

The presence of [blebs](#) in [intracranial aneurysms](#) has been identified as a [risk factor](#) for [aneurysm rupture](#) in clinical studies.



Autopsy and surgical observations have also shown that aneurysm rupture sites tend to occur at blebs or in their immediate vicinity.

Blebs are common in IAs, and most aneurysms harboring blebs have a single bleb. Blebs in the aneurysm neck are rare, but they are equally common in the body and dome. The presence of blebs in IAs was associated with dental infection and negatively associated with hormone replacement therapy ¹⁾.

Formation

De novo [aneurysm bleb](#) formation may occur in areas associated with the combination of high pressure, low [Wall shear stress](#) (WSS), and the center of divergent WSS vectors. The multipoint method is useful for the statistical analysis of hemodynamics in a limited number of [aneurysms](#) ²⁾.

Blebs form at or adjacent to regions of high WSS and are aligned with major intra-aneurysmal flow structures. The formation of blebs results in a lower [Wall shear stress](#) (WSS) state with the formation of a counter-current vortex. These findings imply that locally elevated WSS could contribute to the focalized wall damage that formed these structures ³⁾.

Case reports

A 73-year-old man with a small anterior communication artery aneurysm, 4 mm in diameter, while on

follow-up, developed an aneurysmal subarachnoid hemorrhage 2 weeks after the detection of a newly emerged bleb on the surface of the aneurysm. In conclusion, the formation of a bleb should be considered as a warning sign of an impending rupture, and treatment should be provided even for patients with small aneurysms ⁴⁾

1)

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2)

Uno T, Misaki K, Futami K, Nambu I, Yoshikawa A, Kamide T, Uchiyama N, Nakada M. Hemodynamic factor evaluation using [computational fluid dynamics](#) analysis for de novo bleb formation in [unruptured intracranial aneurysms](#). Neurol Sci. 2021 Jul 31. doi: 10.1007/s10072-021-05482-x. Epub ahead of print. PMID: 34331615.

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4)

Yamano A, Yanaka K, Uemura K, Onuma K, Nakamura K, Ishikawa E. Bleb formation in small unruptured intracranial aneurysm as a predictor of early rupture. J Surg Case Rep. 2018 May 29;2018(5):rjy117. doi: 10.1093/jscr/rjy117. PMID: 29977511; PMCID: PMC6007435.

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