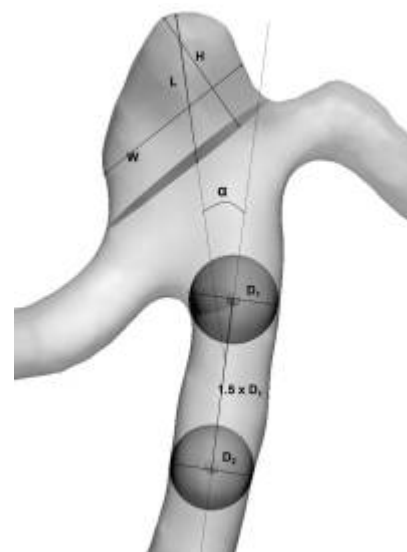


Inflow angle



The angle separating parent [vessel](#) and [aneurysm dome](#) main axes.

Maximal [intracranial aneurysm size](#) and [intracranial aneurysm morphology parameters](#) are used when deciding if an [Intracranial aneurysm](#) (IA) should be treated prophylactically. These parameters are derived from postrupture [morphology](#). As time and [rupture](#) may alter the [aneurysm geometry](#), possible morphological [predictors](#) of a [Ruptured intracranial aneurysm](#) should be established in prerupture aneurysms.

Skodvin et al., from [University Hospital of Northern Norway](#), [Oslo University Hospital](#) Rikshospitalet matched 1:2 with 24 control IAs that remained unruptured during a median follow-up time of 4.5 ([interquartile](#) range, 3.7-8.2) yr. Morphological parameters were automatically measured on 3-dimensional [models](#) constructed from [angiograms](#) obtained at time of [diagnosis](#). Cases and controls were matched by [aneurysm location](#) and [aneurysm size](#), patient [age](#) and [sex](#), and the [PHASES score](#) (population, hypertension, age, size of aneurysm, earlier subarachnoid hemorrhage from another aneurysm, and site of aneurysm) did not differ between the 2 groups.

Only [inflow angle](#) was significantly different in cases vs controls in [univariate analysis](#) ($P = .045$), and remained significant in [multivariable](#) analysis. Maximal size correlated with size ratio in both cases and controls ($P = .015$ and $<.001$, respectively). However, maximal size and inflow angle were correlated in cases but not in controls ($P = .004$. and $.87$, respectively).

A straighter inflow angle may predispose an aneurysm to changes that further increase risk of rupture. Traditional parameters of aneurysm morphology may be of limited value in predicting IA rupture ¹⁾.

In 2016 Ji et al., concluded that unruptured [paraclinoid aneurysms](#) had a high incidence of aneurysm [recanalization](#) (AR) after endovascular treatment. An inflow angle of ≥ 90 degrees and incomplete occlusion were significant predictors of AR ²⁾.

In 2010 the objective of Baharoglu et al., was to evaluate the importance of inflow-angle (IA), the angle separating parent vessel and aneurysm dome main axes.

IA, maximal dimension, height-width ratio, and dome-neck aspect ratio were evaluated in sidewall-type aneurysms with respect to rupture status in a cohort of 116 aneurysms in 102 patients. Computational fluid dynamic analysis was performed in an idealized model with variational analysis of the effect of IA on intra-aneurysmal hemodynamics.

Univariate analysis identified IA as significantly more obtuse in the ruptured subset (124.9 degrees \pm 26.5 degrees versus 105.8 degrees \pm 18.5 degrees, $P=0.0001$); similarly, maximal dimension, height-width ratio, and dome-neck aspect ratio were significantly greater in the ruptured subset; multivariate logistic regression identified only IA ($P=0.0158$) and height-width ratio ($P=0.0017$), but not maximal dimension or dome-neck aspect ratio, as independent discriminants of rupture status. Computational fluid dynamic analysis showed increasing IA leading to deeper migration of the flow recirculation zone into the aneurysm with higher peak flow velocities and a greater transmission of kinetic energy into the distal portion of the dome. Increasing IA resulted in higher inflow velocity and greater wall shear stress magnitude and spatial gradients in both the inflow zone and dome.

They concluded that Inflow-angle is a significant discriminant of rupture status in sidewall-type aneurysms and is associated with higher energy transmission to the dome. These results support inclusion of IA in future prospective aneurysm rupture risk assessment trials ³⁾.

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