Modified Raymond-Roy Classification

The Raymond Roy Occlusion Classification (RROC) is the standard for evaluating coiled aneurysms.

Class I: complete obliteration
Class II: residual neck
Class III: residual aneurysm but not all Class III aneurysms behave the same over time.

Raymond Roy occlusion classification

Angiographic outcomes of conventional aneurysm coiling are generally reported using the three-point scale of Roy and Raymond, where aneurysms are designated as complete occlusion, residual aneurysm, or residual neck.

Unfortunately, this scale is inadequate for describing aneurysms treated with flow diverting stents. Residual or complete filling of the aneurysm is very common immediately after technically successful flow diversion but is not common after technically successful endosaccular treatment. A small neck remnant at follow-up is often accepted as adequate treatment after aneurysm coiling, whereas slight filling of an aneurysm treated with a flow diverting stent may be enough to perpetuate continued mass effect, progressive aneurysm growth and in some cases spontaneous rupture. Finally, a simple assessment of the degree of filling does not take into account the dynamic nature of the contrast stasis and its potential role in predicting aneurysm closure over time. To address these issues, we propose a novel grading scale for the assessment of aneurysms treated with flow diversion. This simple scale accounts for both the amount of aneurysm filling and the degree of contrast stasis seen. We hope this scale will standardize the communication of clinical results with flow diversion. We further anticipate that the simultaneous grading of both filling and stasis will facilitate future research and analysis of flow diverting interventions.

In a retrospective review of 370 patients with 390 intracranial aneurysms treated with coil embolization. A Modified Raymond-Roy Classification (MRRC), in which Class IIIa designates contrast
within the coil interstices and Class IIIb contrast along the aneurysm wall, was applied retrospectively.

Class IIIa aneurysms were more likely to improve to Class I or II than Class IIIb aneurysms (83.34% vs 14.89%, p<0.001) and were also more likely than Class II to improve to Class I (52.78% vs 16.90%, p<0.001). Class IIIb aneurysms were more likely to remain incompletely occluded than Class IIIa aneurysms (85.11% vs 16.67%, p<0.001). Class IIIb aneurysms were larger with wider necks while Class IIIa aneurysms had higher packing density. Class IIIb aneurysms had a higher retreatment rate (33.87% vs 6.54%, p<0.001) and a trend toward higher subsequent rupture rate (3.23% vs 0.00%, p=0.068).

Mascitelli et al., propose the MRRC to further differentiate Class III aneurysms into those likely to progress to complete occlusion and those likely to remain incompletely occluded or to worsen. The MRRC has the potential to expand the definition of adequate coil embolization, possibly decrease procedural risk, and help endovascular neurosurgeons predict which patients need closer angiographic follow-up. These findings need to be validated in a prospective study with independent blinded angiographic grading 3).