Anterior communicating artery aneurysm endovascular treatment

With regard to the endovascular technique, firstly, many Anterior communicating artery aneurysm (AcoA aneurysms) have very small sacs, which makes it difficult to distinguish between the aneurysm neck and the microcatheter selection, leading to a few disadvantages.

The standard coil embolization technique is limited by its inability to occlude wide necked aneurysms. Stent deployment across the aneurysm neck supports the coil mass inside the aneurysmal sac, and furthermore, has an effect on local hemodynamic and biologic changes.

In the cases of Choi et al., 17 of 112 aneurysms (15%) had very small sacs, and 15 of these patients (88%) were treated with surgical clipping.

The second disadvantage of endovascular treatment for AcoA aneurysms is poor controllability and track-ability due to arterial morphology and the acute angle during the endovascular procedure. Moret et al., reported that the main causes of failure to embolize were loops in the cervical and intracranial vessels despite using the cervical approach when necessary and acute angle changes of the posterior projection of the aneurysm.

Furthermore, the lumen of the AcoA is relatively small, and remodeling neck techniques using balloons or stents is particularly difficult when treating wide neck or complex aneurysms Safe and complete endovascular occlusion of these aneurysms usually requires the assistance of combined approaches using balloons and stents in an individually tailored strategy.

The treatment modality of AcoA aneurysms is affected more by anatomic factors than other aneurysms. However, optimal treatment for AcoA aneurysms cannot be determined by any one anatomic characteristic; rather, all of the morphological features and clinical factors must be considered.

Many papers have emphasized the need for a collaborative approach to treatment strategies and have shown varying tendencies toward coiling or clipping.

The decision-making process during recent years has become increasingly more based on collaboration. All patient cases are discussed by a team including at least one endovascular specialist, one neurosurgeon, and one neurologist. Those presenting acutely are always routinely reviewed by both a surgeon and an endovascular radiologist.

In the study of Choi et al., correlated 5 clinical factors and 5 anatomical factors related to determining treatment modality with clinical and anatomical outcomes. Of the 5 clinical factors, age was the important factor in both uni and multivariate analysis. Older patients (age, >65 years) had significantly higher odds of being treated with coil embolization vs. clipping (adjusted OR, 3.78; 95% CI, 1.39-10.3; p=0.0093). The anatomical factors that affected initial treatment modality decision included aneurysm size (small or large vs. medium), neck size (<4 vs. ≥4) dome-to-neck ratio (<2 vs. ≥2), vessel incorporation, multiple lobulation, and morphologic score. Among these 5 anatomical factors, small or large size, dome-to-neck ratio <2, vessel incorporation, and morphologic score ≥2 were statistically significant in univariate analysis. In multivariate analysis, only morphologic score was statistically significant.
Patients with more than 2 unfavorable factors were treated with surgical clipping 4.34 times more often than with coil embolization. Furthermore, higher scoring patients had a higher tendency to be treated with surgical clipping.

**Balloon remodeling**

Balloon remodeling should be considered for broad-based complex ACoA aneurysms. This technique provides a high rate of aneurysm occlusion with an acceptable complication profile, and avoids the need for dual antiplatelet therapy. The balloon trajectory will depend on aneurysm morphology and bilateral access may be useful in selected cases.

**Complications**

Intraprocedural aneurysm rupture and thrombus formation are serious complications during coiling of ruptured intracranial aneurysms, and they more often occur in patients with anterior communicating artery aneurysms.

Prolonged anterograde amnesia and disorientation after anterior communicating artery aneurysm coil embolization.


7) Al-Atrache Z, Friedler B, Shaikh HA, Kavi T. Prolonged anterograde amnesia and disorientation after