

Introduction

To date, limited data exists assessing how aneurysm morphology influences risk of aneurysmal rupture. Recent studies suggest aneurysms of irregular shapes and with more than one lobe may be more prone to rupture. (1, 2) In this study investigators compared the rate of rupture between multilobulated to non-multilobulated aneurysms.

Methods

Solitary aneurysms microsurgically treated by the senior author (M.T.L.) were included from a database of patients treated between January 2010 to April 2013 at a tertiary academic medical center. Patient age, sex, history for hypertension, tobacco use, aneurysm location (anterior vs. posterior), aneurysm rupture at presentation, multiple aneurysms present, and aneurysm size were collected. Aneurysm morphology was retrieved from the official radiologic reports of 3-dimensional angiographic studies. Aneurysms with more than one lobe, including daughter sacs, were categorized as multilobulated and those with a single lobe or fusiform were categorized as non-multilobulated.

Results

A total 206 patients were included; 73.3% were female. Multilobulated aneurysms were observed in 18.0% (37/206) of patients. The mean multilobulated aneurysm size was 7.50 mm in the longest dimension (Range 2 - 19). No difference in the mean age (p-value=.96), gender (p-value=.11), history for hypertension (p-value=.78), tobacco use (p-value=.84), location (p-value=.10), multiple aneurysms present (p-value=.27), or size (p-value=.56) was present. However, 64.9% (24/37) presented with a ruptured aneurysm compared to 40.2% (68/169) for non-multilobulated aneurysms (RR 1.61, p-value=.006, 95% CI 1.19 – 2.18). Multivariate regression analysis, including age, gender, history for hypertension, tobacco use, location, multiple aneurysms present, and size, demonstrated multilobulated aneurysms carried 3.99x the odds of rupture compared to non-multilobulated aneurysms (p-value=.002, 95% CI 1.67 – 9.58).

Conclusions

Patients with multilobulated aneurysms present with a higher rate of ruptured aneurysms compared to patients with non-multilobulated aneurysms. A more aggressive treatment strategy should be considered when weighing therapeutic options for patients with lesions of this morphology type.

Learning Objectives

By the conclusion of this session, participants should be able to 1) Describe the importance of multi-lobulated aneurysm morphology has on the rate of rupture 2) and the discuss the potential need for more aggressive management of these aneurysms.

References

1.Abboud T, Rustom J, Bester M, Czorlich P, Vittorazzi E, Pinnschmidt HO, et al. Morphology of Ruptured and Unruptured Intracranial Aneurysms. World neurosurgery. 2017;99:610-7.

2.Lindgren AE, Koivisto T, Bjorkman J, von Und Zu Fraunberg M, Helin K, Jaaskelainen JE, et al. Irregular Shape of Intracranial Aneurysm Indicates Rupture Risk Irrespective of Size in a Population-Based Cohort. Stroke. 2016;47(5):1219-26.