



The Neurosurgeon's Predicament: Predicting Cerebral Aneurysm Development and Outcomes

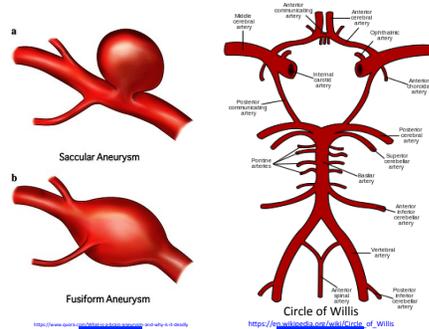
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1. Pathology Background

Cerebral Aneurysms an abnormally weakened, distended areas of blood vessels, usually arteries, in the head

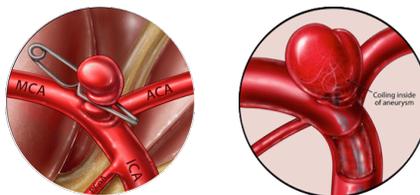


5 - 10% of Americans have unruptured cerebral aneurysms
0.5 - 2% rupture annually, causing subarachnoid hemorrhage
65% of ruptures may result in major morbidity and mortality

Who's At Risk?

Patients who are elderly, female, genetically predisposed, or have a history of tobacco use or hypertension. Regularly taking aspirin or statins may decrease risk of aneurysm development and rupture

2. Treatment Background



13%

Craniotomy and clip

87%

Angiography-assisted endovascular coil, stent, or embolization

Patients usually have better outcomes with coiling than clipping, including less morbidity and mortality, shorter hospital stays, and less rehabilitation

3. Objectives

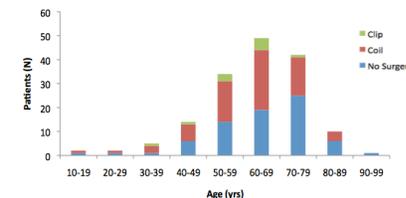
Purpose:

To identify specific patient and procedural characteristics that predict aneurysm development and treatment outcomes, and aid physicians in choosing appropriate treatment for patients' unique circumstances

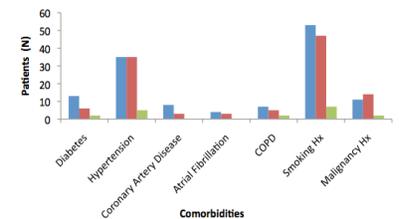
Database Cohort:

Patients with developing or ruptured cerebral aneurysms seen by Dr. Robert J. Singer at Dartmouth Hitchcock Medical Center between June 2013 - July 2015

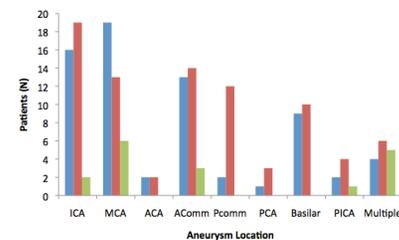
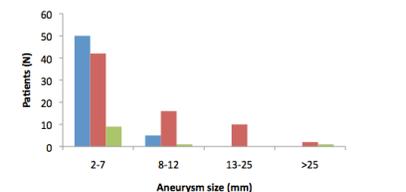
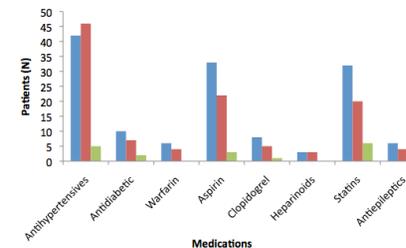
4. Cohort Demographics & Variables



	Count (% of cohort)	
Gender	41 (25.8)	
Male	65	61
Female	118	74.2
Age		
Under 60	57	35.8
Over 60 (Elderly)	102	65.2



	Untreated	Coil	Clip
Treatment	74	74	11
Mean Age	65	61	57
Male	24	14	3
Mean BMI	28.7	26.5	30.0
Family History			
One Side	6	7	1
Both Sides	1	4	0
Previous Coil or Clip	4	11	3
Admit Assessment			
IVH		8	2
Intubated		14	2
PND		11	1
Hydrocephalus		10	1
EVD		13	1
Mean SBP		132.9	127.8
Grading (Means)			
Hunt-Hess		1	1
Fischer		2	1
GCS		13	14
WFNS		2	1
Outcome			
Mean LOS		6	12
Clinical Vasospasm		7	0
Mean PBD		0	0
Positive TCDs		9	0
Mean PBD		1	0
Radiographic Vasospasm		5	0
Mean PBD		0	0
Discharge			
Home		54	9
Rehab		9	1
SNF		2	0
In-Hospital Mortality		7	1
Grading (Means)			
KPS		86	83
GOS		5	5
Mod. Rankin		1	1



6. Results & Conclusions

In agreement with previous clinical studies, older patients in the cohort seen and treated by Dr. Singer were more likely to be left untreated than to undergo procedural treatment. Larger aneurysms (8-25 mm), as well as aneurysms at the posterior communicating artery, were more likely to be treated than not. Aneurysms at the middle cerebral artery were found more likely to be treated endovascularly than with a craniotomy and clip.

	Untreated	Intervention	p*	p**
Mean Age	65	61	57	0.045
Aneurysm Location				
MCA	19 (11.9%)	13 (8.2%)	6 (3.8%)	0.018
PComm	2 (1.3%)	12 (7.5%)	0 (0%)	0.024
Aneurysm Size				
8-12 mm	5 (6.8%)	16 (10.1%)	1 (0.6%)	0.029
13-25 mm	0 (0%)	10 (6.3%)	0 (0%)	0.007

(* for untreated v. intervention; ** for coil v. clip)

Why clinical research?

By seeking to understand how patient demographics and delivery of health care impact patient outcomes, medical research can improve physician practice, standards of care, and patient health

Selected References

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