



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

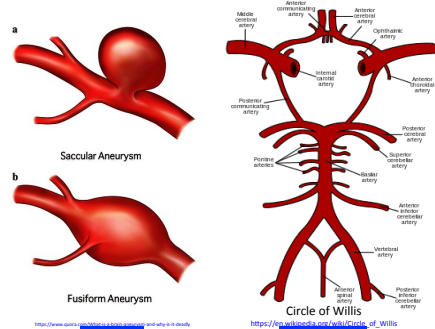
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1. Pathology Background

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?

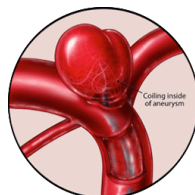
Patients who are elderly, female, genetically predisposed, or have a history of tobacco use or hypertension. Regularly taking aspirin or statins may decrease risk of aneurysm development and rupture

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

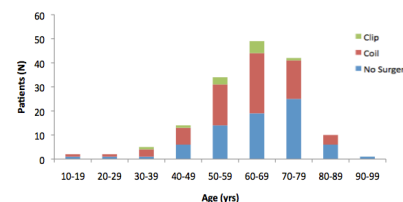
Purpose:

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

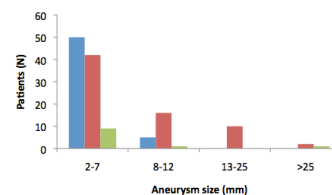
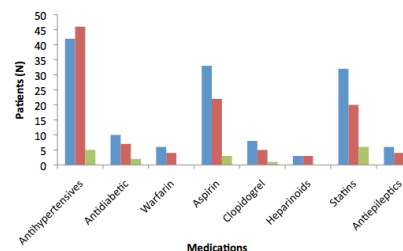
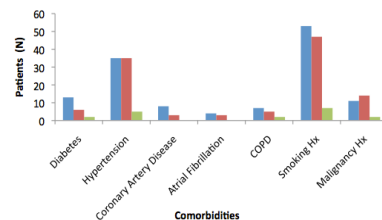
Database Cohort:

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

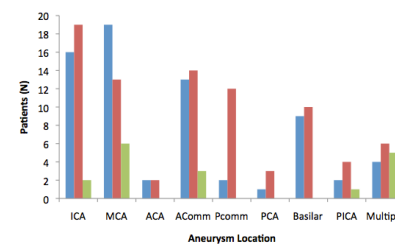
4. Cohort Demographics & Variables



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



	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**
		Coil	Clip		
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

(p* for untreated v. intervention; p** 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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