

Increased Risk of Intracranial Aneurysm Rupture in Methamphetamine Use

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BACKGROUND

- Methamphetamine use is a growing problem in the United States, particularly in the California Central Valley.
- Ruptured intracranial saccular aneurysms are a common cause of atraumatic subarachnoid hemorrhage (SAH).
- SAH is associated with high morbidity and mortality.
- Methamphetamine use is associated with poorer outcomes in patients with SAH secondary to aneurysm rupture.
- Risk of intracranial aneurysm rupture is low if the aneurysm is smaller than 7mm in its greatest diameter.
- Most common intervention for unruptured aneurysms at risk for rupture is endovascular coiling.
- Generally do not intervene on unruptured aneurysms smaller than 7mm due to the risk of undergoing procedure.
- Aneurysms in patients with history of methamphetamine use may be at increased risk of rupture at a smaller size than the general population.

OBJECTIVES

- We sought to characterize the size and location of ruptured and non-ruptured intracranial aneurysms in patients with history of methamphetamine use.

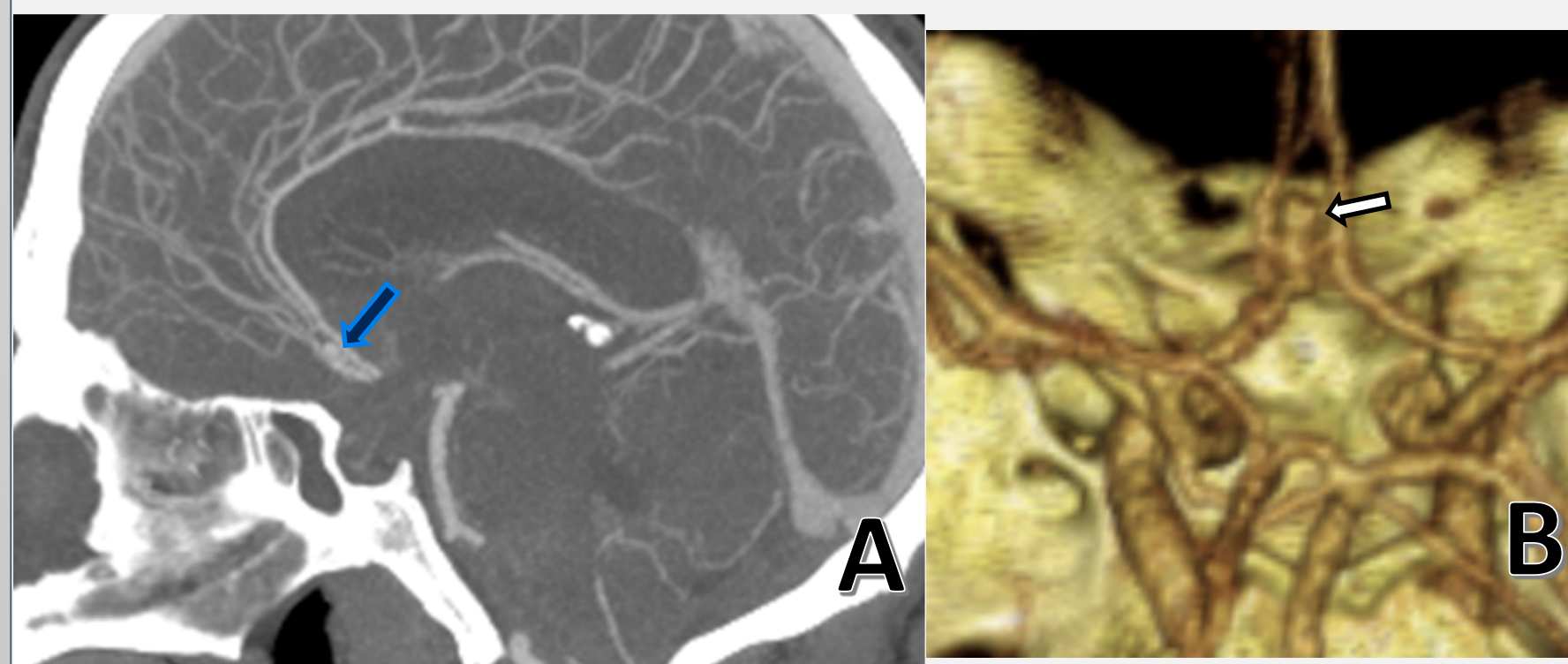


Figure 1. (A) Sagittal CT MIP image demonstrating presence of anterior communicating artery aneurysm (blue arrow) and (B) 3-D reconstruction of anterior communicating artery aneurysm (white arrow).

METHODS

- Retrospective query of electronic medical records between January 2010 and November 2016 to identify patients with intracranial aneurysm.
- Manual chart review to determine history of methamphetamine use, from clinical history or positive urine test.
- 62 eligible patients identified with saccular intracranial aneurysm and methamphetamine history.
- 73 intracranial aneurysms were measured in three dimensions by a neuroradiologist.
- Largest dimension was recorded and used for data analysis.
- Intracranial aneurysm location was subdivided into anterior and posterior circulation.
- Ruptured aneurysms were identified by the presence of subarachnoid hemorrhage and/or intraventricular hemorrhage on imaging.

RESULTS

	Ruptured (n=29)	Unruptured (n=44)
Sex		
Female	21 (72%)	26 (59%)
Male	8 (28%)	18 (41%)
Age		
Median	51	53.5
Age 25-40	2 (7%)	3 (7%)
Age 41-55	24 (83%)	25 (57%)
Age 56+	3 (10%)	16 (36%)
Aneurysm Location		
Anterior	18 (62%)	38 (86%)
Posterior	11 (38%)	6 (14%)
Aneurysm Size		
Median	5.5	4.5
Mean	6.3	5.1
STD	2.5	2.5

CONCLUSIONS AND FUTURE PLANS

- Average size of ruptured and unruptured aneurysms in patients with history of methamphetamine was less than 7mm.
- Methamphetamine use may be a risk factor for early intracranial aneurysm rupture, compared to the general population.
- Risk of rupture at a size smaller than 7mm appears significant in this higher-risk population.
- Patients presenting with unruptured intracranial aneurysm with history of methamphetamine use may benefit from earlier endovascular intervention than the general population, given poor outcomes associated with subarachnoid hemorrhage in this population.
- Further research (i.e. larger, prospective studies) would help further characterize the relationship between methamphetamine use and intracranial aneurysm rupture.

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