MAYO CLINIC

TWISTS AND TURNS:

WHAT ROLE DOES INTERNAL CAROTID ARTERY TORTUOSITY PLAY IN INTERNAL CAROTID ARTERY DISEASE AND NEED FOR REINTERVENTION?

Sydney Garner, MD
General Surgery Resident, PGYIII

LEARNING OBJECTIVES

01

Describe the importance of Internal Carotid Artery (ICA) stenosis

02

Assess the relationship between ICA tortuosity and ICA stenosis

03

Determine the risk of symptomatic presentation, rates of restenosis, and peri-operative outcomes in patients with tortuous ICAs

DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIP(S) WITH INELIGIBLE COMPANIES

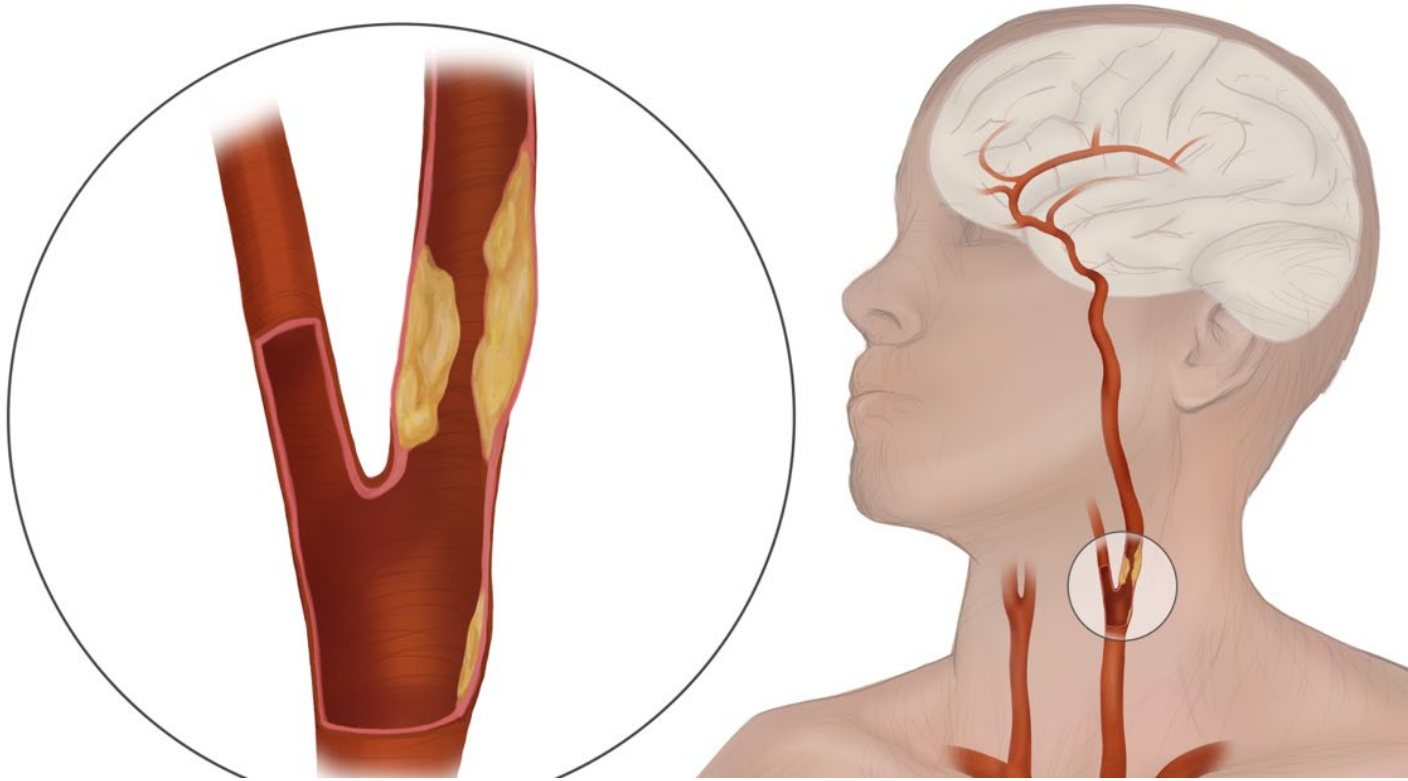
- Nothing to disclose

REFERENCES TO OFF-LABEL USAGE(S) OF PHARMACEUTICALS OR INSTRUMENTS

- Nothing to disclose

BACKGROUND

- Internal carotid artery (ICA) stenosis is responsible for approximately 20% of ischemic strokes
  - Embolic
  - Hypoperfusion
- The relationship between distal ICA tortuosity and ICA stenosis is poorly understood
- Tortuosity is variably defined
- Many studies only assess presence of tortuosity and not degree



METHODS

- Single center retrospective cohort study
- All patients undergoing intervention for ICA disease between February 2015 and June 2025
- All patients had preoperative imaging of the head (either CTA or MRA)
- Patients were divided into three groups based on the degree of distal tortuosity of their ICA

DEGREES OF TORTUOSITY

Mild

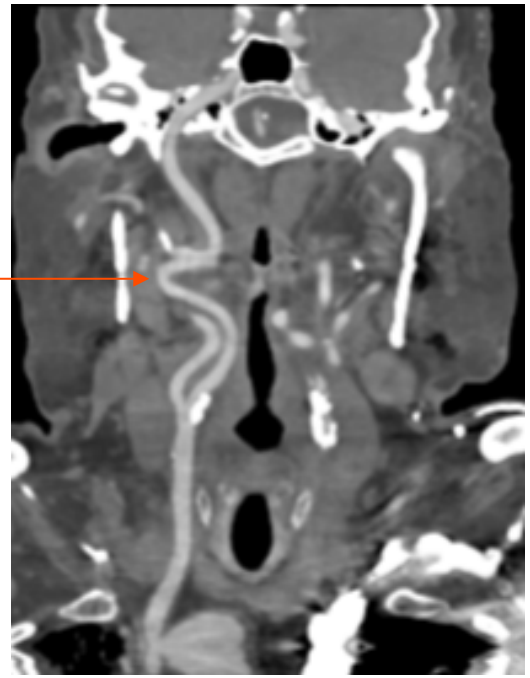
- No S curve or minor S curve with bend ≤ 75 degrees

Moderate

- S curve with 2 bends > 75 degrees or 1 bend > 90 degrees

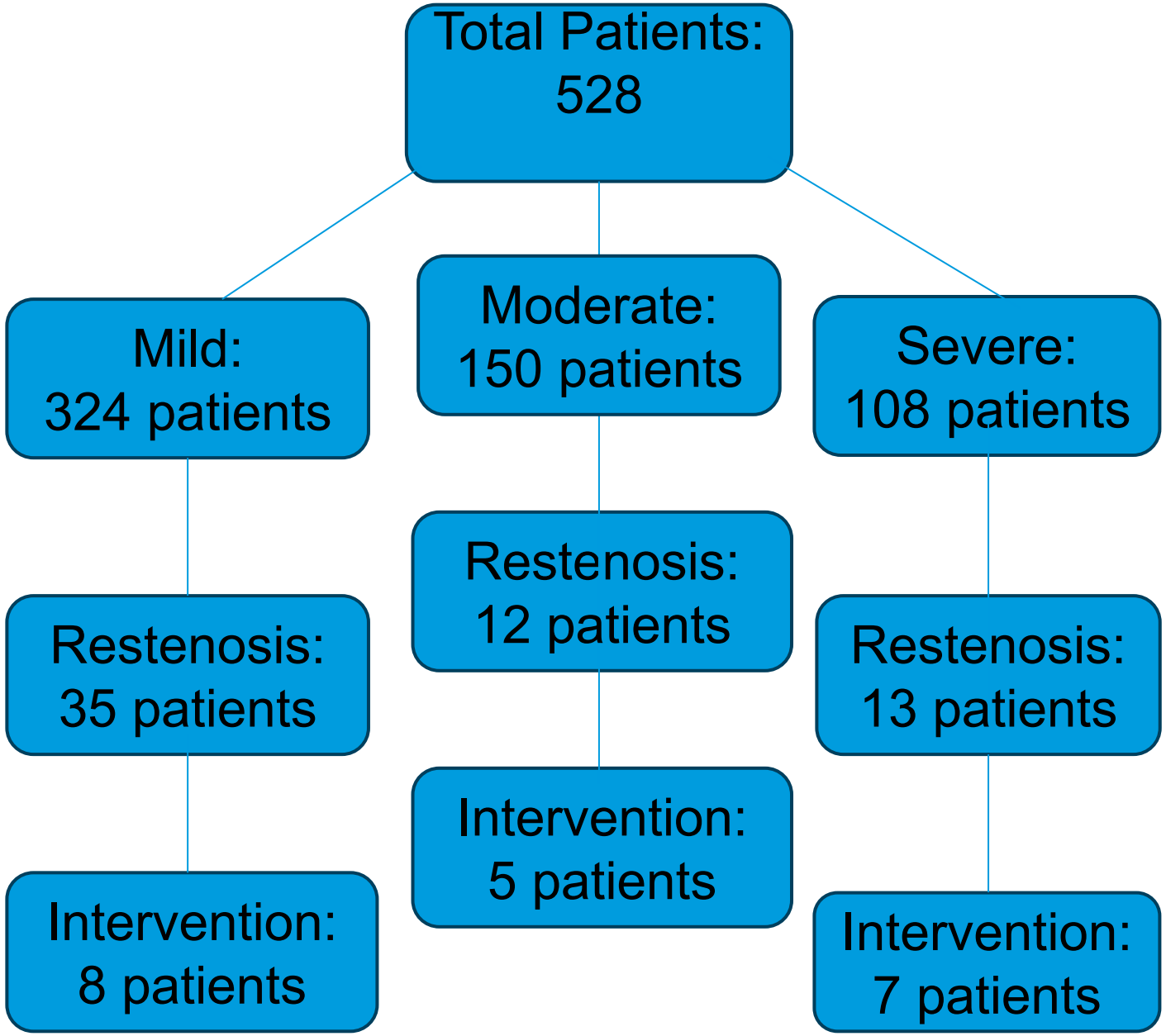
Moderate

- S curve with 2 bends > 90 degrees or redundant loops/coils



RESULTS

- 528 patients were divided into mild, moderate, or severe stenosis
- Majority of patients had mild stenosis, followed by moderate and then severe stenosis
- Main outcome was the composite of ipsilateral stroke, TIA, myocardial infarction (MI), and death at 30 days
- Secondary outcomes were rates of restenosis and reintervention



DEMOGRAPHICS

Variable	Mild (N=324)	Moderate (N=150)	Severe (N=108)	p-value
Age (Years)	72.13	72.68	72.88	0.68
Male sex	96 (29.6%)	53 (35.3%)	46 (42.6%)	**0.04**
Height (cm)	173.07	169.4	168.0	**< 0.01**
BMI	28.54	29.93	29.0	0.14
Hypertension	276 (85.2%)	128 (85.3%)	94 (87.0%)	0.89
Coronary artery disease	130 (40.1%)	61 (40.7%)	43 (39.8%)	0.99
Diabetes mellitus	105 (32.4%)	51 (34.0%)	34 (31.5%)	0.9
Current smoker	37 (11.4%)	10 (6.7%)	16 (14.8%)	0.1

RESULTS

Variable	Mild (N = 324)	Moderate (N = 150)	Severe (N = 108)	P-Value
Symptomatic Presentation	108 (33.3%)	54 (36.0%)	49 (45.4%)	0.08
Stroke	69 (21.3%)	28 (18.7%)	36 (33.3%)	**0.01**
TIA	35 (10.8%)	18 (12.0%)	11 (10.2%)	0.89
Amaurosis Fugax	16 (4.9%)	13 (8.7%)	6 (5.6%)	0.28
Degree of Stenosis on CTA (%)	78.32	77.02	72.48	**<0.01**
Degree of Stenosis on MRA (%)	72.65	66.50	74.98	0.05
Pre-Op PSV (cm/s)	277.19	265.96	249.45	0.17
Midterm PSV (cm/s)	106.09	97.97	95.65	0.76
Composite 30-Day (MI/stroke/TIA/death)	7 (2.2%)	4 (2.7%)	6 (5.6%)	0.20
TIA (Mid-term)	16 (4.9.%)	8 (5.3)	0 (0.0)%	**0.03**
Composite Mid-Term (MI/stroke/TIA/death)	62 (19.4%)	39 (26.0%)	17 (15.7%)	0.58

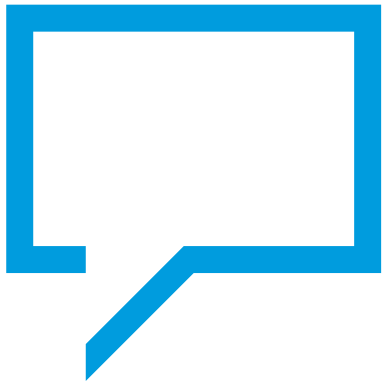
CONCLUSIONS

- Thirty-day composite rates of MI/stroke/TIA/death were low and comparable across mild, moderate, and severe tortuosity groups
- Findings suggest that tortuosity may drive embolic risk independent of luminal narrowing
- Degree of tortuosity of the vessel does not make a patient more likely to need reintervention to maintain vessel patency

LIMITATIONS

- Single center retrospective study
- Length of follow up was variable and not standardized

QUESTIONS & ANSWERS



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