



Surgery  
UNIVERSITY OF TORONTO

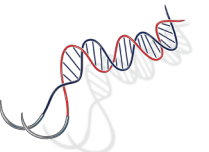
# Case Presentation: Carotid Artery Aneurysm

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Kian Draper  
Winnipeg Vascular & Endovascular Symposium  
April 3, 2025



TEMERTY FACULTY OF MEDICINE  
UNIVERSITY OF TORONTO

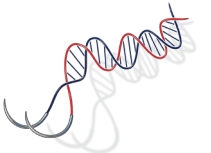


# Disclosure



## Presenter: Kian Draper

- I have no current relationships with commercial entities

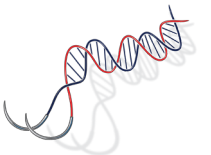


# Audience Poll



What is ***your*** experience with carotid artery aneurysms?

- 1) 0 cases
- 2) 1- 5 cases
- 3) 6-10 cases
- 4) 10 + cases





46M

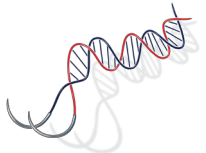
### Past Medical History

- STEMI - aneurysmal coronary arteries
- Atrial fibrillation
- Eosinophilia
- Hypertension
- Dyslipidemia
- Celiac artery aneurysm



### Medications

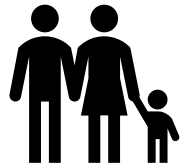
- ASA 81 mg PO daily
- Atorvastatin 80 mg PO QHS
- Bisoprolol 2.5 mg PO daily
- Perindopril 4 mg PO daily
- Edoxaban 60 mg PO QHS



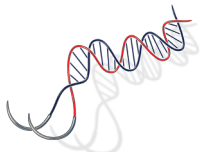


## Family history

- Negative for:
  - Aneurysms
  - Vasculitis
  - Connective tissue diseases



Former smoker, 10 pack year history





## History of present illness

Multiple vascular aneurysms with cause NYD

- 2009 persistent eosinophilia
- 2011 temporal artery biopsy for acute onset left temporal pain
- 2016 for pulsatile occipital mass
- 2019 STEMI treated with PCI, noted to have ectatic coronary arteries
- 2023 incidental celiac artery aneurysm 9 x 14 mm on CT chest for dyspnea
- 2024 pulsatile left neck mass
  - Bilateral carotid aneurysms L > R
  - Brought to Saint Michaels hospital after STEMI + multiple aneurysms for interdisciplinary workup





## Continued work up

- Hematology
  - Patient diagnosed with lymphocytic hypereosinophilic syndrome (bone marrow biopsy)
  - Started on ivermectin empirically
  - Started on 0.5mg/kg dosed steroids with tapering for planned OR
- Rheumatology
  - No underlying vasculitis
- Genetic testing
  - Variant of uncertain significance in the IKZF1 gene

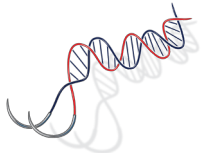


# Audience Poll



What is the size criteria to repair carotid artery aneurysms?

- 1)  $> 1.5$  cm
- 2)  $> 2$  cm
- 3)  $> 2.5$  cm
- 4)  $> 3$  cm

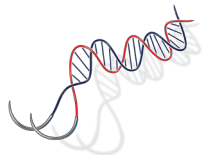






## Pre-operative optimization

- Steroids tapered
  - 40 mg PO daily to 23 mg PO daily pre-operatively
  - continued in perioperative period
  - perioperative stress dosing administered
- Seen by anesthesia → fit for surgery



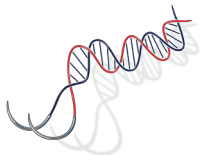


### Post operative course

- CVICU post op
- Steroids stress dosed
- High drain output, resolved with protamine
- Mild ipsilateral tongue deviation
- POD 3 discharged home in stable condition and back on therapeutic anticoagulation

### Out patient follow up

- Seen in clinic 2 weeks post op
- Wounds healing well
- Tongue deviation improved
- ENT vocal cord assessment arranged
  - anticipation of contralateral carotid artery aneurysm repair
- Surgical pathology: moderate eosinophils and myxoid changes

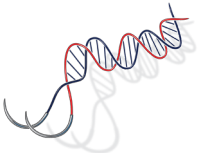


# Audience Poll



What is the most common presentation of extracranial carotid artery aneurysms?

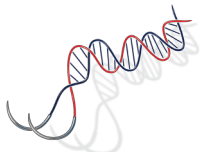
- 1) Transient ischemic attack/stroke
- 2) Asymptomatic pulsatile mass
- 3) Vocal hoarseness
- 4) Rupture





## Discussion – Carotid Artery Aneurysms

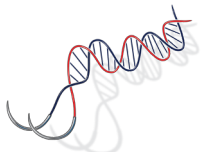
- Incidence
  - Rare <1% of carotid disorders
- Etiology
  - atherosclerosis (38%) > traumatic (11%) > mycotic (5%)
- Symptoms
  - Cerebral ischemia (36%)> mass (33%) > asymptomatic (13%)> compression (9%) > local pain (3%)
- Location
  - ICA( 46%) > bifurcation (20%) > CCA (8%) > ECA (1%)





## Discussion – Carotid Artery Aneurysms

- Operative intervention is warranted for carotid aneurysms that are
  - Enlarging
  - > 2 cm
  - Mycotic
  - Symptomatic
  - Thrombogenic
- Observation is justified if
  - Elderly
  - High operative risk
  - Small asymptomatic aneurysm





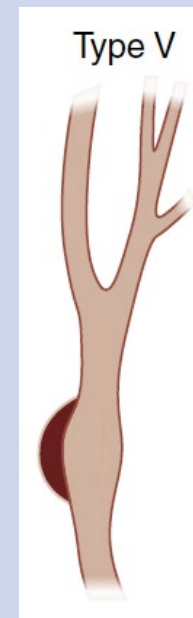
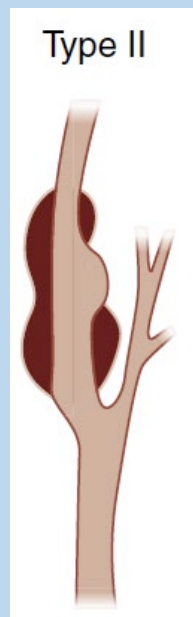
Type 1

Type 2

Type 3

Type 4

Type 5



Isolated, short, ICA  
above carotid bulb

Long ICA aneurysms  
from carotid bulb up  
to line of Blaisdell  
(between the styloid  
process and angle of  
the mandible)

Proximal ICA and  
carotid bifurcation

Extensive, involving  
the CCA and ICA or  
concomitant separate  
CCA and ICA  
aneurysms

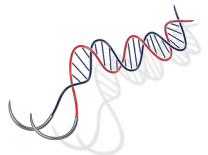
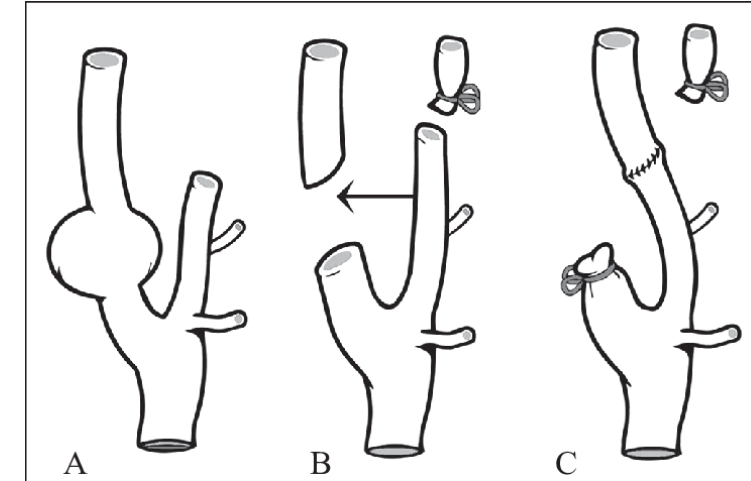
Isolated CCA  
aneurysms





## Discussion – Carotid Artery Aneurysms

- Surgical reconstruction
  - Primary repair
  - Patch repair
  - Aneurysm resection and end-to-end anastomosis
  - Interposition graft
  - Aneurysm resection, transposition of distal ICA onto ECA
  - Extracranial to intracranial bypass
    - not shown to improve outcome or reduce stroke risk
- Ligation (last resort)
  - Combined stroke/death rate of 12%

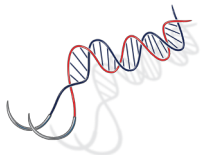






## Discussion – Carotid Artery Aneurysms

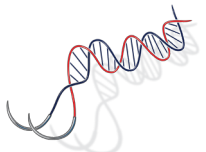
- Endovascular therapy
  - Avoids difficult dissection
  - Less cranial nerve dysfunction/injury
- Techniques reported
  - Bare metal stents +/- trans stent coiling
  - Double stents
  - Autogenous vein graft covered stents
  - Endovascular coils
  - Covered stents





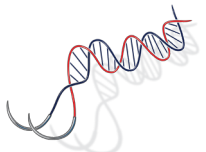
## **Hypereosinophilic syndrome and carotid artery aneurysms**

- Hypereosinophilic syndrome (HES): persistent and marked blood and tissue eosinophilia associated with eosinophil-mediated organ damage and/or dysfunction
  - Aneurysm formation
  - Dissection
  - Thrombosis
  - Embolism
- Diagnosis: bone marrow biopsy
- Association between hypereosinophilic syndrome and aneurysms not well understood
  - Limited to case reports
  - More commonly affects coronary arteries
  - Arterial wall staining for eosinophil major basic protein can show eosinophils in the adventitia
- Treatment
  - Oral steroids and monitor eosinophil levels
  - +/- immune modulators



## References

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**Thank You**



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