Management of Axillosubclavian DVT

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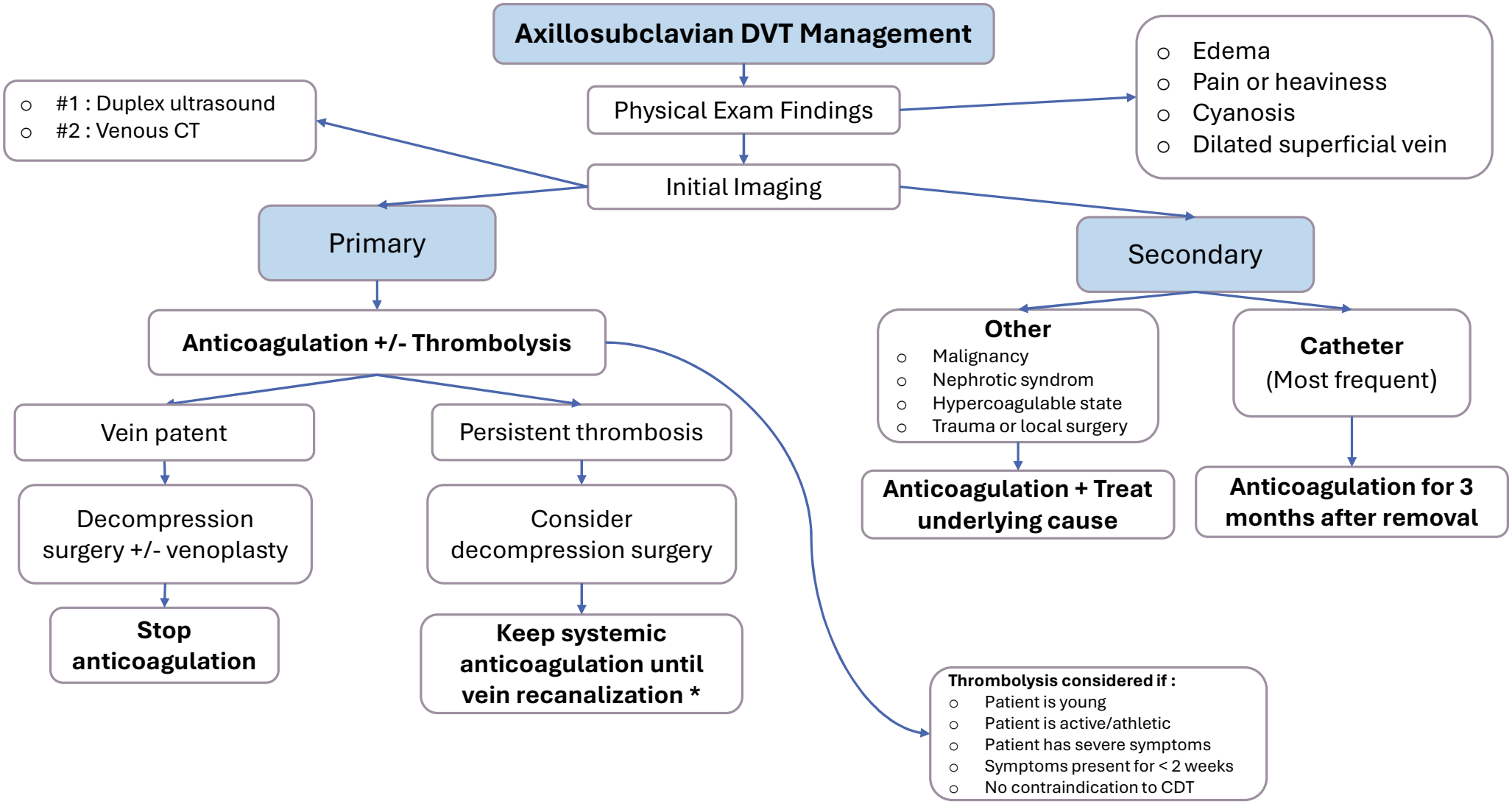
Presenter Disclosure

- I have no current relationships with commercial entities

Plan

- Definition and Epidemiology
- Clinical Presentation
- Diagnosis
- Management Strategies
- Clinical Pearls
- Conclusion


Axillosubclavian DVT Management
Physical Exam Findings
Edema
Pain or heaviness
Cyanosis
Dilated superficial vein
#1 : Duplex ultrasound
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Initial Imaging
Primary
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Anticoagulation +/- Thrombolysis
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Consider decompression surgery
Stop anticoagulation
Keep systemic anticoagulation until vein recanalization *
Thrombolysis considered if :
Patient is young
Patient is active/athletic
Patient has severe symptoms
Symptoms present for < 2 weeks
No contraindication to CDT

Epidemiology

Axillosubclavian DVT

- Account for 5–10% of all DVTs
- Primary disease : Compression and subsequent thrombosis of axillosubclavian vein
  - ~1–2 patients per 100,000 persons per year
- Secondary: More frequent and related mainly to central catheters/cancer

Clinical Presentation

When to suspect Axillosubclavian DVT ?

Frequent symptoms of the UE :

- Edema
- Pain or heaviness
- Cyanosis
- Dilated superficial veins (Urschel sign)

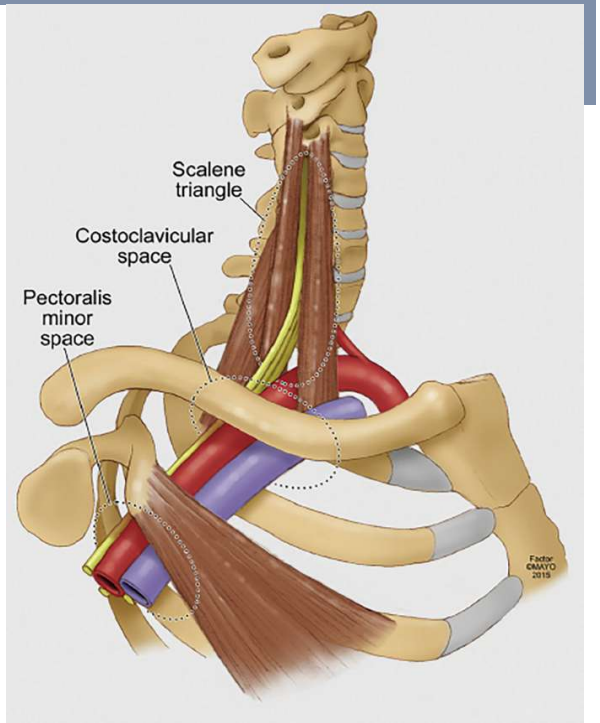
** Asymptomatic in 9% or PE in 5-10%**

Definition & Epidemiology

Primary Axillosubclavian DVT

Also called Paget– Schroetter Syndrome or Effort thrombosis or young adult DVT

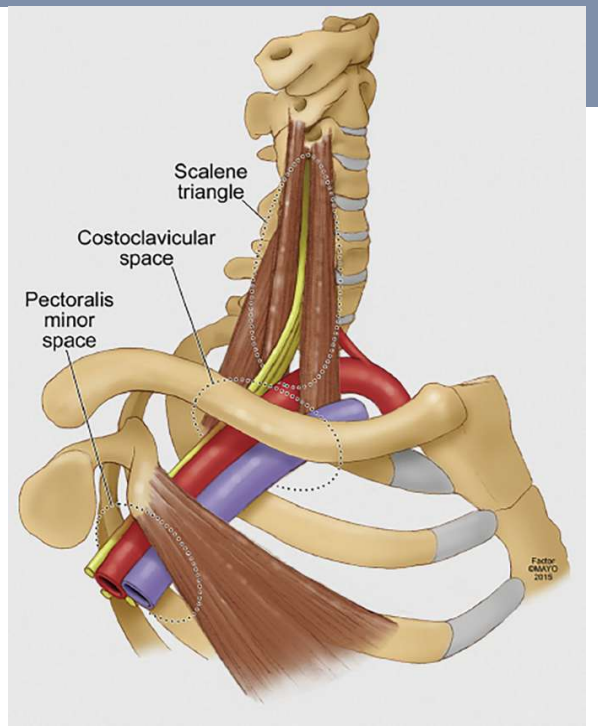
- Incidence of 1-2 per 100 000 persons per year
- Younger athletic patients
- Repetitive overhead movement
- Equal gender ratio



Definition & Epidemiology

Primary Axillosubclavian DVT

- Repetitive injury to the subclavian vein
- Compression sites :
  - Costoclavicular space
  - Anterior Scalene Muscle
  - Pectoralis Minor muscle Insertion



Definition & Epidemiology

Secondary Axillosubclavian DVT – Differential diagnosis

- Central venous catheter
- Pacemaker leads
- Nephrotic syndrome
- Malignancy
- Trauma or local surgery
- Hypercoagulable state

*Key difference: No mechanical compression requiring surgery

Diagnosis – First Line Imaging

Duplex Ultrasound

- Sensitivity and specificity of > 80%
- Provocative maneuvers (arm abduction)
- Findings : Lack of vessel compression, echogenic material and absence of flow.
- Limitations : Poor visualization under clavicle of the subclavian vein

Diagnosis

CT Venography

- High sensitivity and specificity (> 90%)
- Visualization of central veins, pulmonary veins and extrinsic compression sites.
- Provocative maneuvers.
- Limitations : Iodine contrast and radiation (Younger patients)

Diagnosis

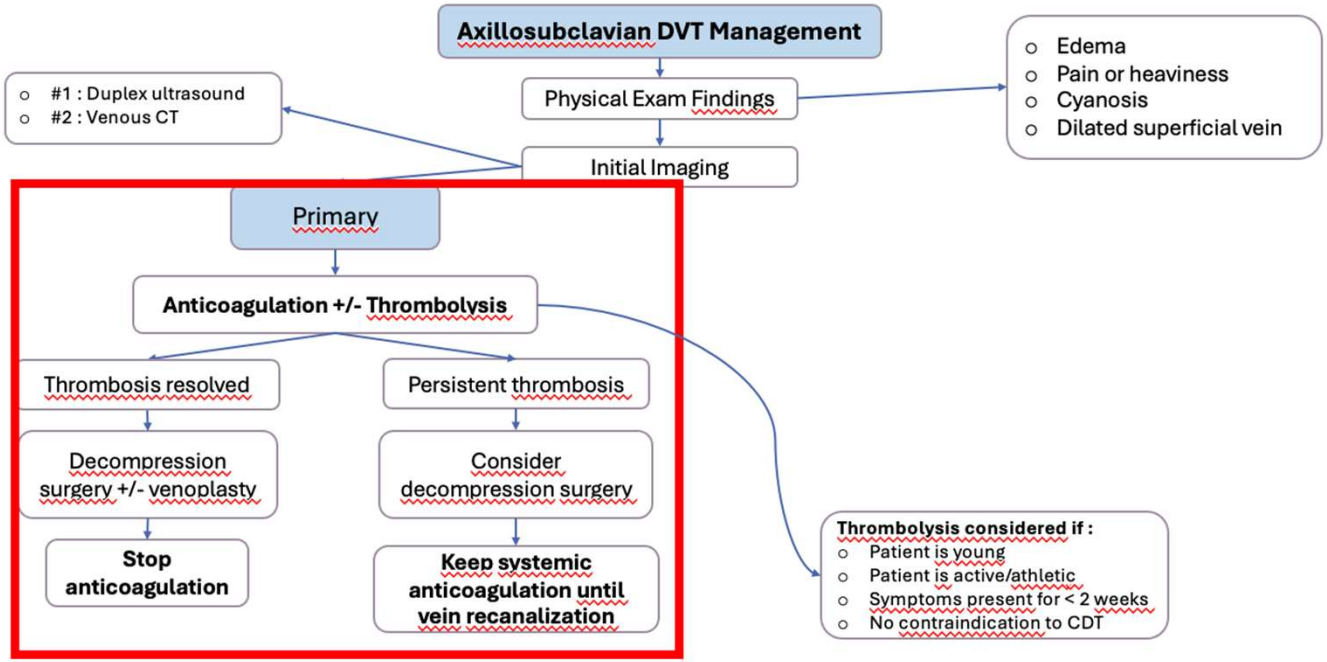
Magnetic Resonance Venography

- High sensibility and specificity - usually not necessary.
- Time consuming and costly.

Contrast Venography

- Rarely necessary as the initial diagnostics tool
- Used for Catheter directed thrombolysis

Management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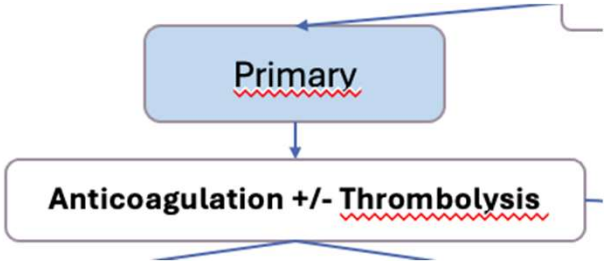
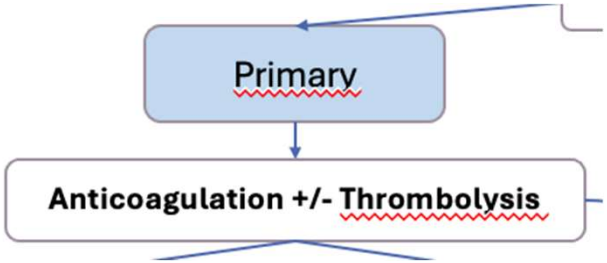


Primary Axillosubclavian DVT

- Systemic anticoagulation : 1st line treatment for all.
- Goal : Prevent clot extension, reduce PE risk, relieve symptoms, and restore venous patency.
- Anticoagulation alone vs catheter directed thrombolysis ?

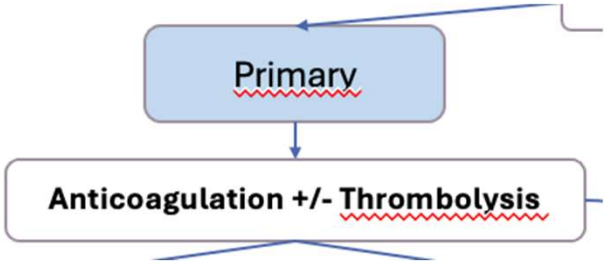
Management



Primary Axillosubclavian DVT – Anticoagulation vs CDT

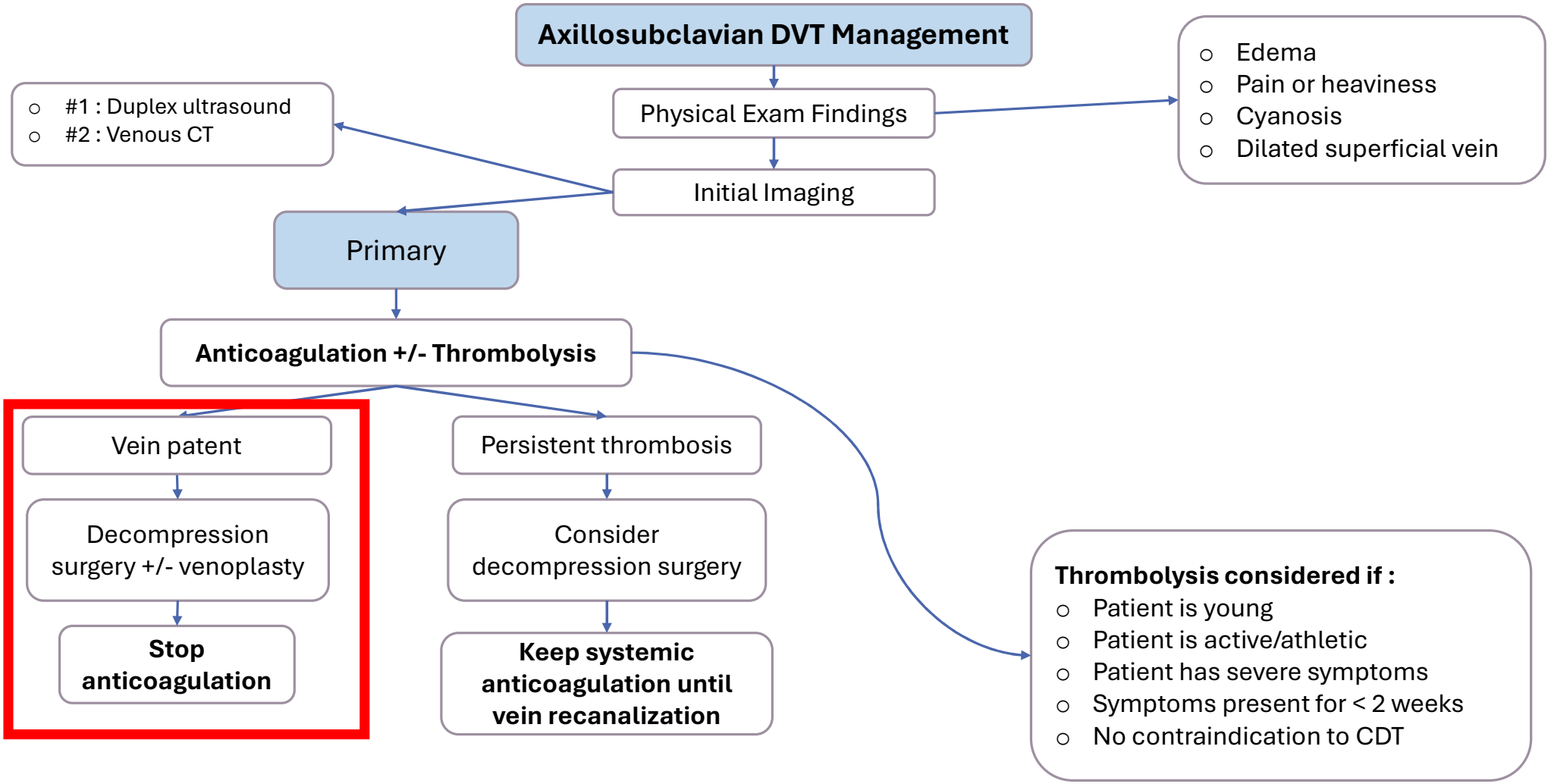
- No prospective trial comparing both.
- **Comparable** venous patency between anticoagulation and CDT before surgical decompression. [3-4]
- Faster recanalization for very symptomatic patients with CDT.[9]
- Higher bleeding risks and longer hospitalization with CDT.[10]

Management



Primary Axillosubclavian DVT – Anticoagulation vs CDT

- CDT within 14 days of symptom onset achieves >90 % vein patency, versus 50% when performed after 14 days.[6-7]
- Shared making decision is key
- Extrapolation from ATTRACT and CaVenT for iliofemoral DVT reminds us that it might be more efficient for selected patients then in routine usage.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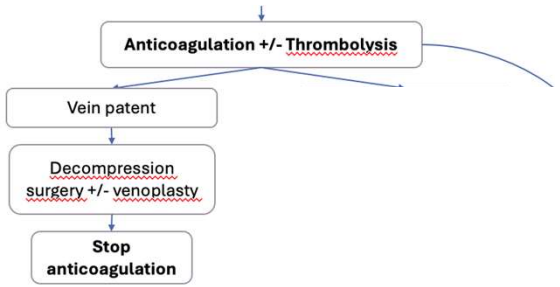
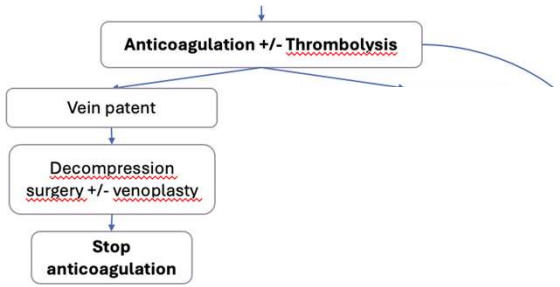


Surgical decompression timeline – Patent vein after CDT

- Decompression vs conservative → Less recurrence, less symptoms
- Decompression **directly after** CDT (same hospitalization) : lowers risk of recurrent thrombosis (7% vs 11%).[11]
- **Delayed** decompression (1–3 months): allows spontaneous improvement of venous stenosis (~40%), potentially reducing the need for venoplasty.[1]
- Both strategies yield comparable overall post operative and follow-up outcomes.

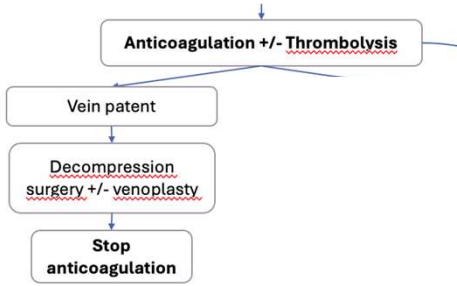
Management



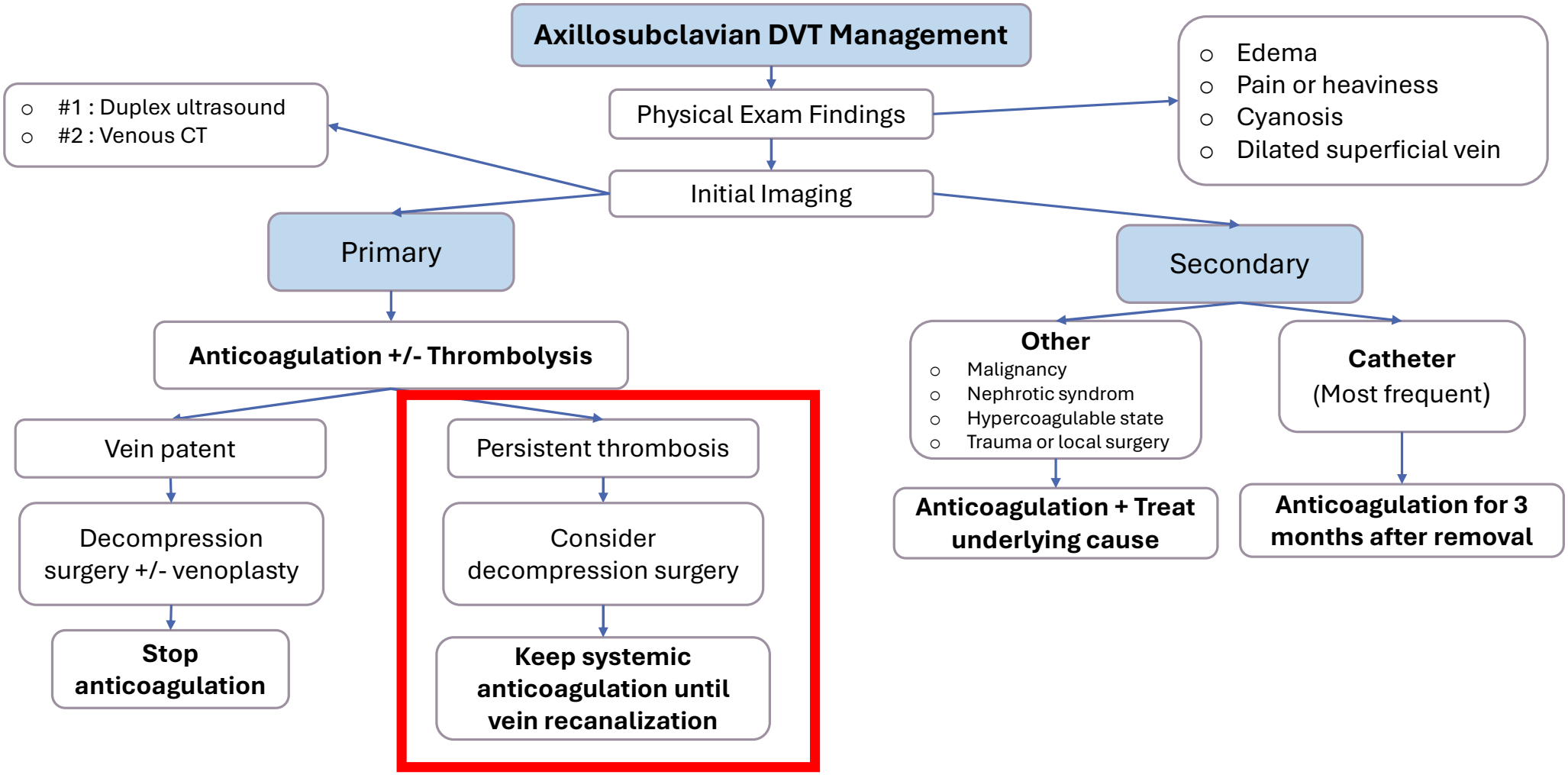
Primary Axillosubclavian DVT – Surgery

- Paraclavicular vs infraclavicular vs transaxillary approaches.
- All three with similar goals of decompression: First rib excision, anterior scalene muscle release, venolysis.
- Comparable operative, postoperative and follow-up outcomes.[12]

Management - Our experience



- CDT if symptoms < 14 days then discharged.
- Paraclavicular approach +/- infraclavicular incision if exposure is difficult 1-3 months after CDT. **Emphasis on venolysis!**
- Venography +/- venoplasty performed during the same procedure after decompression.
- Patients are discharged on oral anticoagulation and undergo a 6-week follow-up ultrasound; if the vein remains patent, anticoagulation is discontinued after a **minimum total duration of 3 months.**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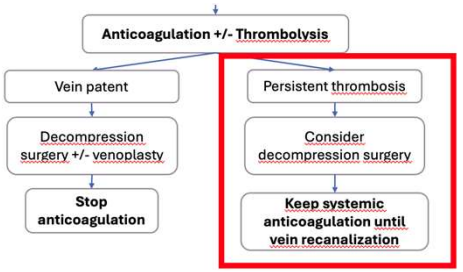
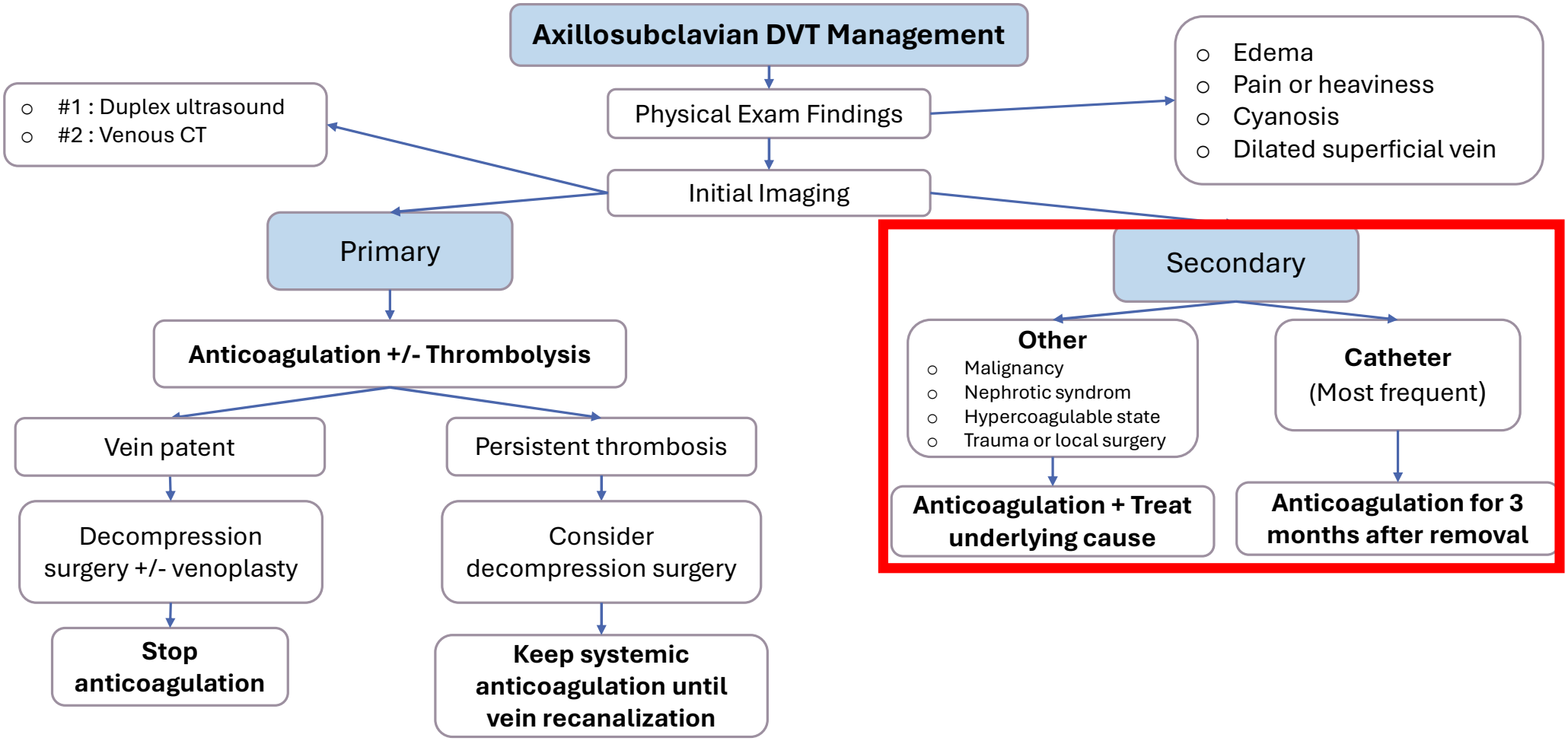


Persistent vein thrombosis

- No clear literature nor treatment pathways.
- Retrospective studies with signals for
  - Symptomatic improvement through decompression of collateral circulation.
  - 10–15% axillosubclavian vein recanalization rate.
- Shared decision-making with patients who remain symptomatic.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Catheter (Most frequent)
Anticoagulation + Treat underlying cause
Anticoagulation for 3 months after removal

Management - Secondary Axillosubclavian DVT

- First line treatment : anticoagulation + treat underlying cause
- Internal medicine consult
- Assess for underlying thrombophilia and malignancy, including personal and family history of hypercoagulability.
- When catheter based thrombosis :
  - If catheter removable : remove + anticoagulation for 3 months
  - If catheter not removable : anticoagulation

Clinical Pearls

SVC filters – Indication

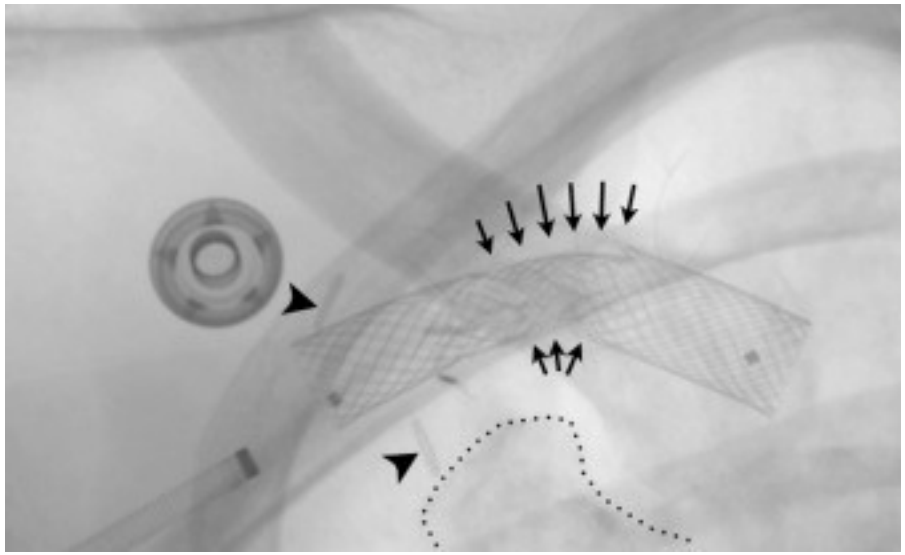
- Anticoagulation contraindication or recurrent PE/thrombus progression despite adequate anticoagulation.[9]
- Complications rare but reported :
  - Cardiac tamponade
  - Filter embolization or malapposition
  - SVC perforation

Clinical Pearls

Avoid stenting in the subclavian vein before decompression

Risk:

- stent fracture
- recurrent thrombosis



Mallios A, Taubman K, Claiborne P, Blebea J. *Subclavian Vein Stent Fracture and Venous Motion*. **Annals of Vascular Surgery**. 2015 Oct;29(7):1451.e1–1451.e4. doi:10.1016/j.avsg.2015.04.064. Presented at the 2013 Annual Meeting of the Midwestern Vascular Surgical Society, Chicago, IL, September 6–8, 2013

Clinical Pearls

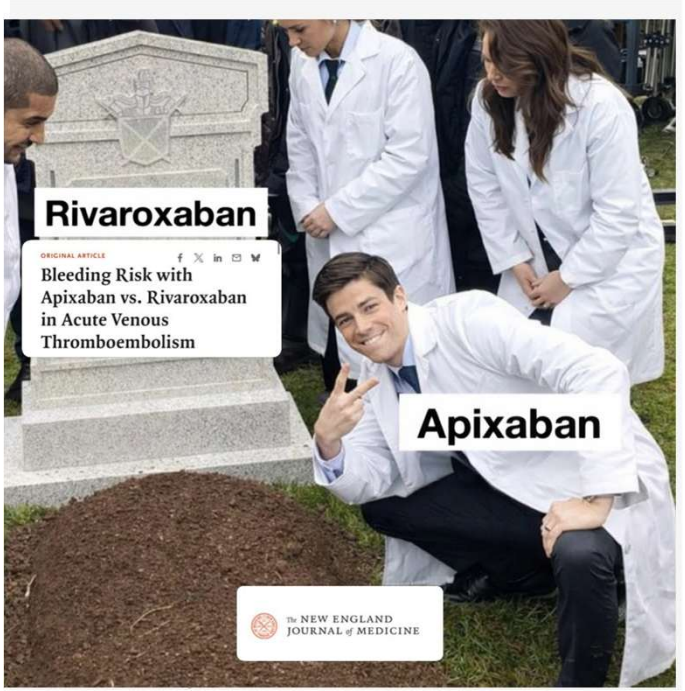
McCleery Syndrome

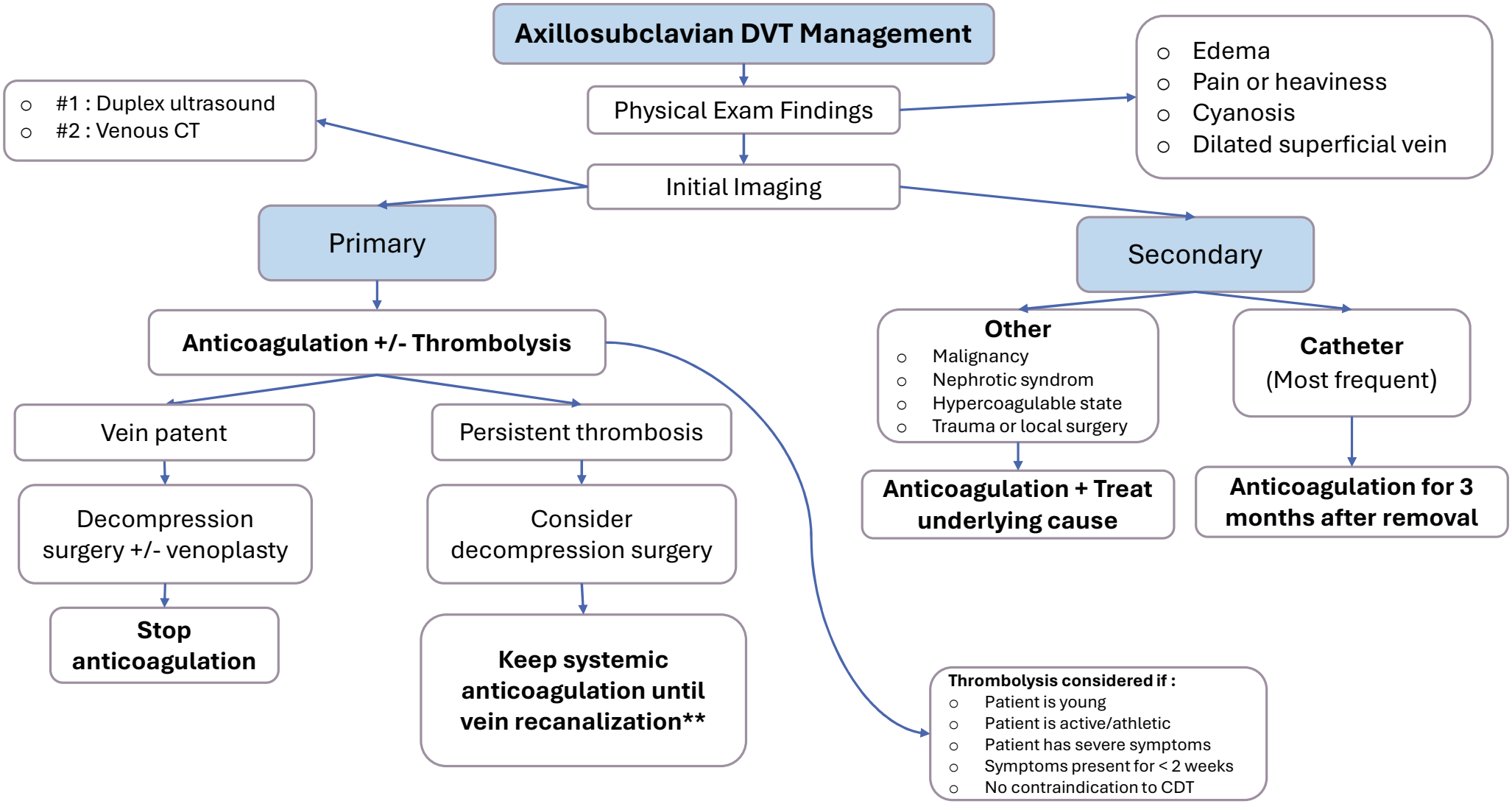
- Described in 1951 by Dr McCleery.
- Intermittent obstruction of the subclavian vein **without** thrombosis.
- Symptoms same as axillosubclavian DVT – Worst in Abduction.
- No anticoagulation necessary.
- **Surgical decompression.**

Clinical Pearls

Choice of DOAC

- Apixaban is associated with a significantly lower risk of clinically relevant bleeding than Rivaroxaban over 3 months.
- Acute symptomatic PE or ALL proximal DVT.

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Thank you

Dr. Gegiia

Dr. Rhéaume

Dr. Boisvert

CHU de Québec Université Laval

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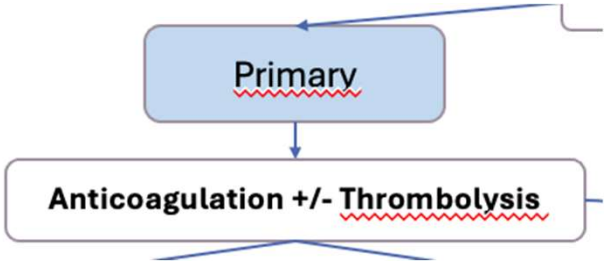
References

This presentation was based in part on Chapters 126 and 150 from Rutherford's Vascular Surgery and Endovascular Therapy – 10th edition.

1. Sen I, DeMartino RR, Bjarnason H, Neisen MJ, Kalra M. Results of a flexible patient-centered approach to the timing of thoracic outlet decompression in Paget-Schroetter syndrome. *Ann Vasc Surg.* 2023.
2. Hoexum F, Hoebink M, Coveliers HME, et al. Management of Paget-Schroetter syndrome: a systematic review and meta-analysis. *Eur J Vasc Endovasc Surg.* 2023.
3. Guzzo JL, Chang K, Demos J, Black JH, Freischlag JA. Preoperative thrombolysis and venoplasty affords no benefit in patency following first rib resection and scalenectomy for subacute and chronic subclavian vein thrombosis. *J Vasc Surg.* 2010.
4. Dua A, Deslarzes-Dubuis C, Rothenberg KA, Gologorsky R, Lee JT. Long-term functional outcomes after 188 rib resections in patients with thoracic outlet syndrome. *Ann Vasc Surg.* 2020.
5. Lugo J, Tanious A, Armstrong P, et al. Acute Paget-Schroetter syndrome: does the first rib routinely need to be removed after thrombolysis? *Ann Vasc Surg.* 2015.
6. Urschel HC Jr, Razzuk MA. Paget-Schroetter syndrome: what is the best management? *Ann Thorac Surg.*2000;69:1663–1668.
7. Schneider DB, DiMuzio PJ, Martin ND, et al. Combination treatment of venous thoracic outlet syndrome: open surgical decompression and intraoperative angioplasty. *J Vasc Surg.* 2004;40:599–603.
8. Chun TT, O'Connell JB, Rigberg DA, et al. Preoperative thrombolysis is associated with improved vein patency and functional outcomes after first rib resection in acute Paget-Schroetter syndrome. *J Vasc Surg.* 2022.
9. Kucher N. Deep-vein thrombosis of the upper extremities. *N Engl J Med.* 2011.
10. Xing Z, Tang L, Zhu Z, Hu X. Effects of thrombolysis on outcomes of patients with deep venous thrombosis: an updated meta-analysis. *PLoS One.* 2018.
11. Angle N, Gelabert HA, Farooq MM, et al. Safety and efficacy of early surgical decompression of the thoracic outlet for Paget-Schroetter syndrome. *Ann Vasc Surg.* 2001.
12. Ziapour B, Ranjbar K, Tian T, Thompson RW, Salehi P. A systematic review and meta-analysis of surgical approaches for venous thoracic outlet syndrome. *J Surg Res.* 2025.

- Acute < 14 jours → CDT → Perméable = résection
- Acute < 14 jours → CDT → pas perméable = Anticoagulation x 3 mois et suivi, si perméable résection et pas perméable quels sont les sx (Sx ++ résection, si asx, anticoagulation long terme ou cesser selon patient)
- Subacute > 14 jours → anticoagulation 3 mois puis suivi avec duplex → (Perméable → Résection OU non perméable, symptomes ?? Si pas de symptomes anticoag +/- résection +/- arrêter tout, si sx, idem)
- Chronique → pas de sx, rien, sx anticoag 3 mois et suivi

Management

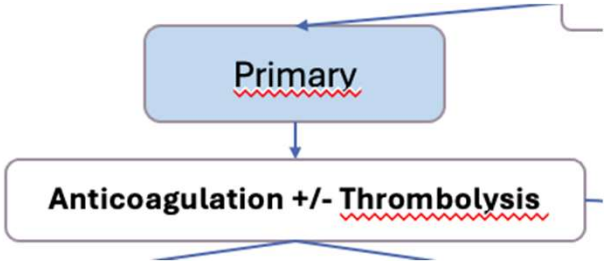


Primary Axillosubclavian DVT – Systemic Anticoagulation

- Goal : Prevent clot extension, reduce PE risk, and relieve symptoms.

- *Without* surgical decompression: 50% with persistent symptoms, 38% post-thrombotic syndrome, 11% recurrence.[1-2]
- *With* surgical decompression: 91% 1-year vein patency, with 80% patients with improved symptoms. [3-4]

Management



Primary Axillosubclavian DVT – Catheter-directed thrombolysis (CDT)

- *Without* surgical decompression : High recurrence of thrombosis (30% at 1-month)[5]
- *With* surgical decompression: >90% vein patency, 96% symptom-free, 95% free of arm swelling long-term.[3-4]
- CDT within 14 days of symptom onset achieves 100% vein recanalisation, versus 50% when performed after 14 days.[6-7]