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Congress on Thrombosis

# Indications for endovascular management of Venous Thrombosis

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## Declaration of Conflict Of Interest

- I have no potential conflict of interest to report  
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- I have the following potential conflict(s) of interest to report

## Deep Venous Thrombosis (DVT) :

- Refers to the formation of blood clots within the deep veins, most commonly occurring in the lower extremities.
- It is a serious medical condition that can result in local pain and gait disturbance
- DVT progression can lead to death or major disability as a result of pulmonar embolism, postthrombotic sybdrome or limb amputation

## Treatment (DVT) :

It is important to differ between acute and chronic DVT:

Acute – less than 15 days

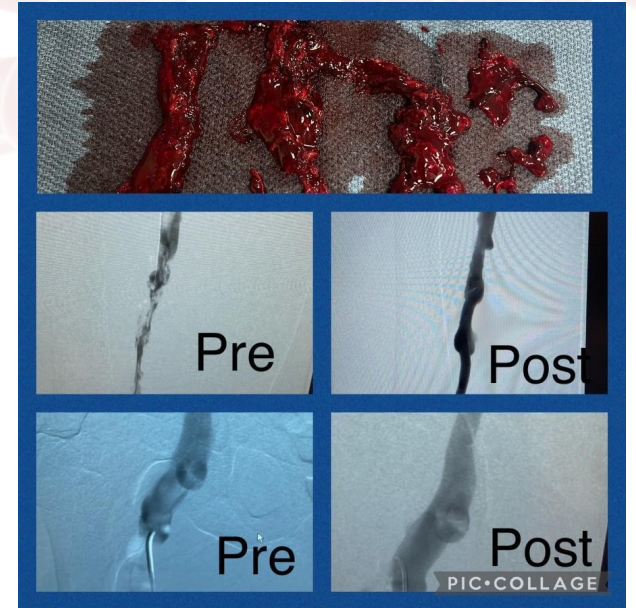
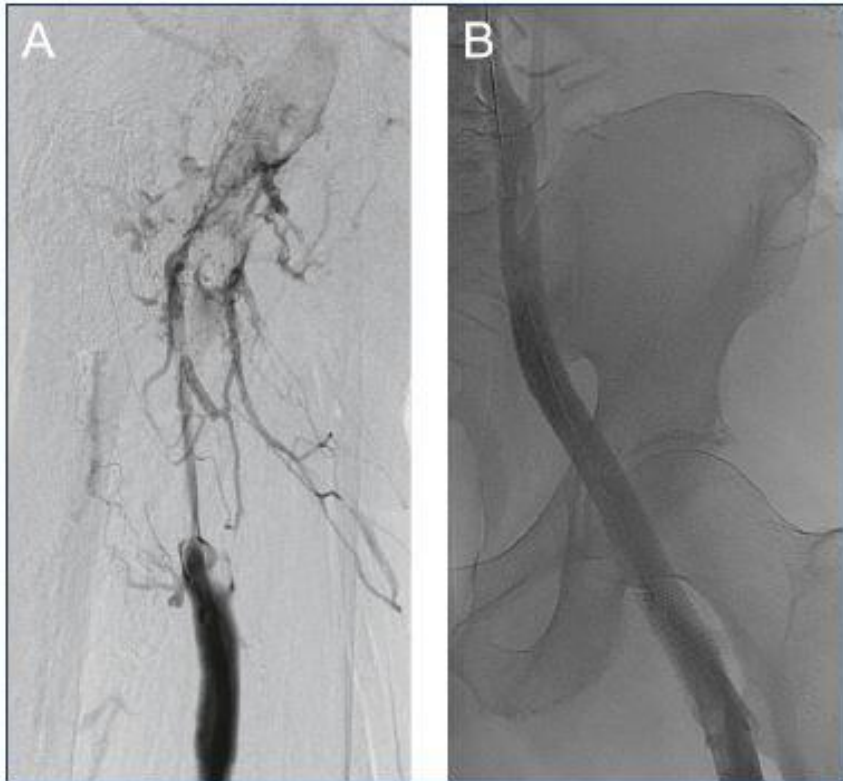
Chronic – more than 15 days

While anticoagulation therapy is the standard treatment for DVT, there are specific indications for endovascular interventions to consider.

Early thrombus removal can rapidly relieve symptoms and prevent disease progression

# Endovascular Treatment

When to use it?



## Extensive Iliofemoral DVT:

- Iliofemoral DVT involves the iliac, common femoral, and/or femoral veins.
- Endovascular treatment is considered when there is extensive clot burden affecting these deep veins.
- Indications include persistent symptoms, risk of post-thrombotic syndrome, and potential clot propagation.

## Phlegmasia Cerulea Dolens:

- Phlegmasia Cerulea Dolens is a severe form of DVT characterized by extensive thrombosis and limb ischemia.
- It requires urgent endovascular intervention to relieve the obstruction and restore blood flow.
- Treatment options may include catheter-directed thrombolysis, mechanical thrombectomy, or surgical decompression.

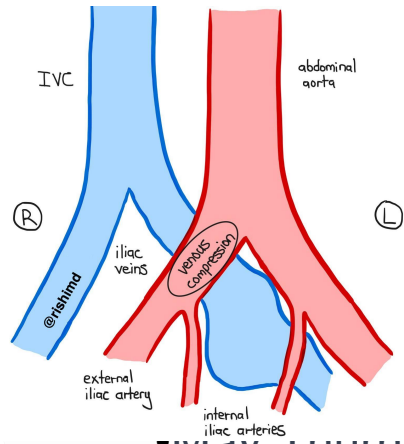


## Acute Limb Ischemia:

- DVT can cause acute limb ischemia, leading to compromised blood supply to the affected limb.
- Endovascular intervention is indicated when there is a threat of irreversible tissue damage.
- Thrombolysis, mechanical thrombectomy, or a combination of both can be utilized to restore blood flow.

## Recurrent DVT despite optimal anticoagulation:

- Some patients experience recurrent DVT despite receiving appropriate anticoagulation therapy.
- Endovascular treatment can be considered to eliminate the clot burden and prevent further recurrence.
- Strategies may include balloon angioplasty, stent placement, or mechanical thrombectomy.



## Symptomatic May-Thurner Syndrome:

May-Thurner Syndrome results from compression of the left iliac vein by the overlying right iliac artery.

- It can lead to iliofemoral DVT and chronic symptoms.
- Endovascular treatment aims to relieve the venous compression and restore normal blood flow.

The background of the slide features a decorative pattern of red blood cells, represented as biconcave discs, scattered across the white space. A dark red horizontal bar is at the top of the slide.

# Endovascular Treatment

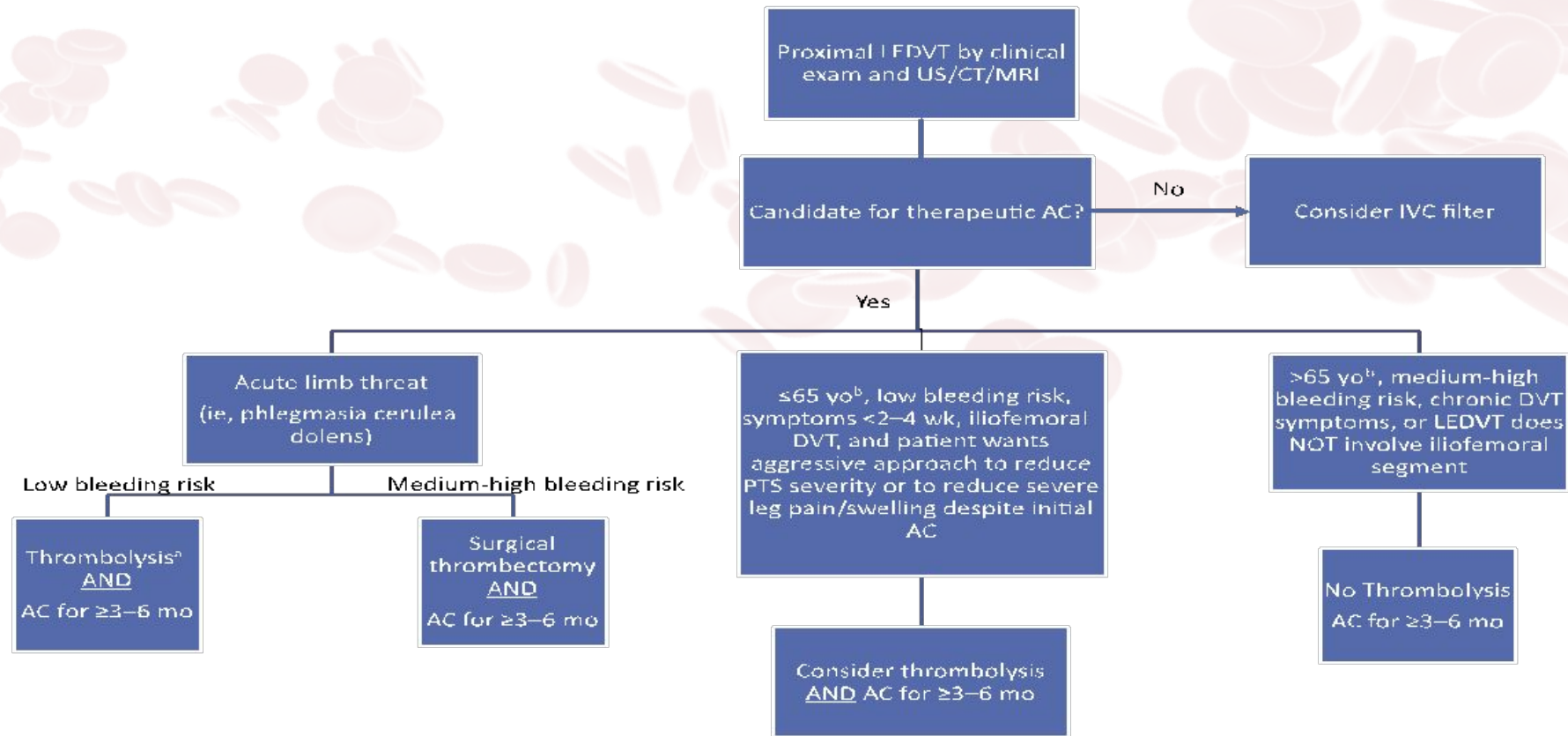
Various endovascular procedures has been developed in recent years

One of the major therapeutic methods to treat lower extremity DVT

# The goals of endovascular treatment for DVT include:

1. Restoring blood flow in the affected vein.
2. Relieving symptoms such as pain and swelling.
3. Preventing or reducing the risk of long-term complications, such as post-thrombotic syndrome.
4. Enhancing the efficacy of anticoagulant therapy by removing or reducing the clot burden.
5. Providing an alternative treatment option for patients who cannot tolerate or have contraindications to traditional therapies.

## Therapy Options for Iliofemoral Venous Thrombosis



**Fig. 1.** Management algorithm for patients with acute proximal LEDVT. AC, anticoagulation; LEDVT, lower extremity deep vein thrombosis; PTS, postthrombotic syndrome; yo, years old. <sup>a</sup>Patients older than 65 years were shown to have a higher risk of bleeding from thrombolysis (as per ATTRACT study results). <sup>b</sup>Thrombolysis should be reserved as first-line treatment to speed symptom relief and reduce PTS in patients who want aggressive treatment (given ATTRACT study results).

## Inferior vena cava filters

- Modern IVC Filters are delivered percutaneously via common femoral or jugular access
- Very controversial over the years.
- It can be retrieval
- for patients who have contraindications to anticoagulation.

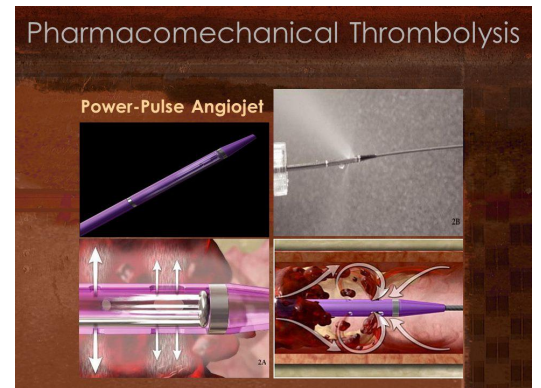


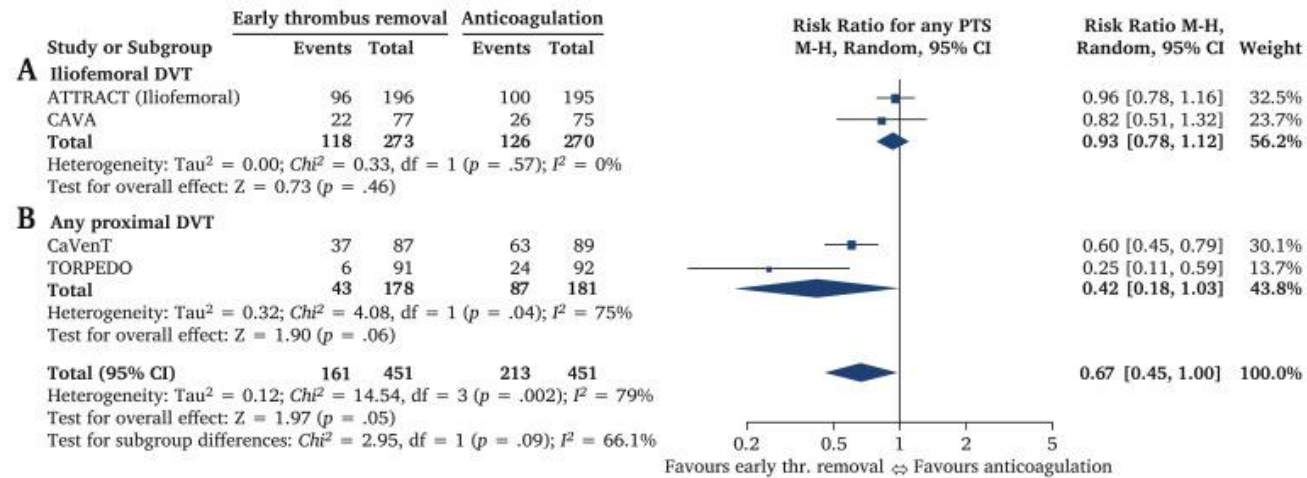
# Catheter-Directed Thrombolysis (CDT)

- Catheter-directed thrombolysis is a minimally invasive procedure.
- A catheter is inserted into the affected vein, and thrombolytic agent is delivered directly to the clot.
- CDT is often performed in conjunction with anticoagulant therapy to optimize clot resolution.

# Pharmacomechanical Thrombolysis (PMT)

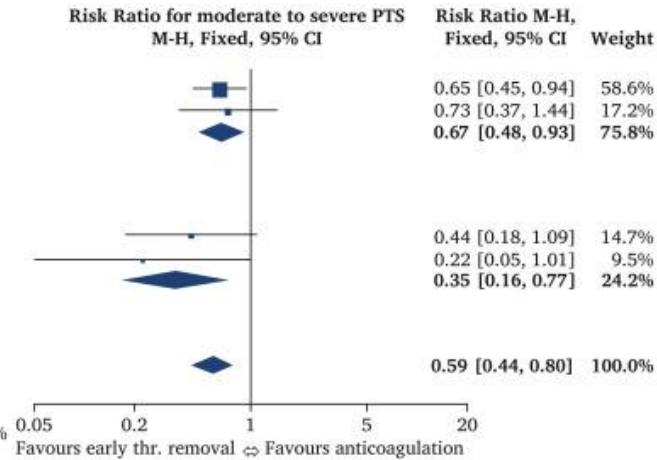
- Pharmacomechanical thrombolysis combines the use of a thrombolytic agent with mechanical techniques to remove or break up the clot.
- Similar to CDT, a catheter is inserted into the vein, and a thrombolytic agent is administered.
- Mechanical devices, such as rotating wires, ultrasound, or laser catheters, are used to disrupt and remove the clot.
- PMT offers the advantage of potentially faster and more complete clot removal compared to CDT alone.





Forest plot analysis of randomised controlled trials comparing early thrombus (thr.) removal techniques with anticoagulation alone regarding the outcome of any post-thrombotic syndrome (PTS) in patients with (A) iliofemoral deep vein thrombosis (DVT) or (B) any proximal DVT. PTS incidence was lower with early thrombus removal techniques than anticoagulation alone.

Study or Subgroup	Early thrombus removal		Anticoagulation	
	Events	Total	Events	Total
<b>A Iliofemoral DVT</b>				
ATTRACT (Iliofemoral)	36	196	55	195
CAVA	12	77	16	75
<b>Total</b>	<b>48</b>	<b>273</b>	<b>71</b>	<b>270</b>
Heterogeneity: $Chi^2 = 0.09$ , $df = 1$ ( $p = .77$ ); $I^2 = 0\%$ Test for overall effect: $Z = 2.42$ ( $p = .02$ )				
<b>B Any proximal DVT</b>				
CaVenT	6	87	14	89
TORPEDO	2	91	9	92
<b>Total</b>	<b>8</b>	<b>178</b>	<b>23</b>	<b>181</b>
Heterogeneity: $Chi^2 = 0.56$ , $df = 1$ ( $p = .45$ ); $I^2 = 0\%$ Test for overall effect: $Z = 2.63$ ( $p = .009$ )				
<b>Total (95% CI)</b>	<b>56</b>	<b>451</b>	<b>94</b>	<b>451</b>
Heterogeneity: $Chi^2 = 2.63$ , $df = 3$ ( $p = .45$ ); $I^2 = 0\%$ Test for overall effect: $Z = 3.42$ ( $p = .0006$ ) Test for subgroup differences: $Chi^2 = 2.20$ , $df = 1$ ( $p = .14$ ); $I^2 = 54.6\%$				



Forest plot analysis of randomised controlled trials comparing early thrombus (thr.) removal techniques with anticoagulation alone regarding the outcome of moderate to severe post-thrombotic syndrome (PTS) in patients with (A) iliofemoral deep vein thrombosis (DVT) or (B) any proximal DVT. PTS incidence was lower with early thrombus removal techniques than anticoagulation alone



Recommendation 34

In selected patients with symptomatic iliofemoral deep vein thrombosis, early thrombus removal strategies should be considered.

Class	Level	References
IIa	A	Enden <i>et al.</i> (2012), <sup>222</sup> Vedantham <i>et al.</i> (2017), <sup>223</sup> Notten <i>et al.</i> (2020), <sup>226</sup> Sharifi <i>et al.</i> (2012), <sup>230</sup> Comerota <i>et al.</i> (2019), <sup>233</sup> Kahn <i>et al.</i> (2020) <sup>237</sup>

Recommendation 35

For patients with deep vein thrombosis limited to femoral, popliteal, or calf veins, early thrombus removal is not recommended.

Class	Level	Reference
III	B	Kearon <i>et al.</i> (2019) <sup>234</sup>



#### Recommendation 36

For patients with deep vein thrombosis treated by early thrombus removal, with or without stenting, it is recommended that the duration of anticoagulation should be at least as long as if the patients were treated by anticoagulation alone and at the discretion of the treating physician.

Class	Level	References
I	C	Kearon <i>et al.</i> (2019), <sup>234</sup> Eijgenraam <i>et al.</i> (2014) <sup>236</sup>

#### Recommendation 37

For patients with iliofemoral deep vein thrombosis who undergo early thrombus removal, it is recommended that the choice of therapy is based on the judgement of the treating physician.


Class	Level	Reference
IIa	C	consensus

# Angioplasty and Stenting

- Angioplasty and stenting are used to treat venous occlusions or stenosis resulting from chronic DVT.
- During angioplasty, a balloon-tipped catheter is inflated to open up the stenotic vein.
- If the vein remains stenotic after angioplasty, a stent may be placed to provide structural support and maintain vein patency.
- Angioplasty and stenting can help alleviate symptoms, improve venous function, and reduce the risk of post-thrombotic syndrome.

### A systematic review on the use of deep venous stenting for acute venous thrombosis of the lower limb

Mohamed AH Taha<sup>1,2</sup> , Andrew Busuttill<sup>1</sup>, Roshan Bootun<sup>1</sup> and Alun H Davies<sup>1</sup>

Phlebology  
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#### Abstract

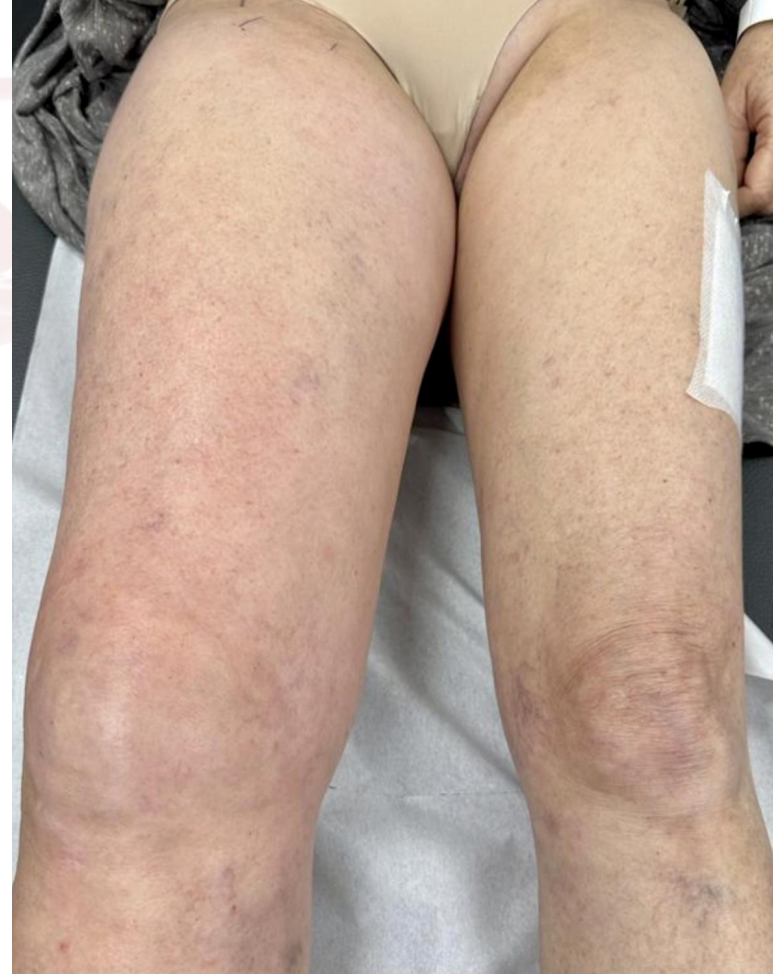
**Objectives:** The aim is to evaluate venous stent patency, the development of post-thrombotic syndrome, recurrence, quality of life and the optimal post-procedural anticoagulation regimen in the treatment of iliofemoral deep venous thrombosis.

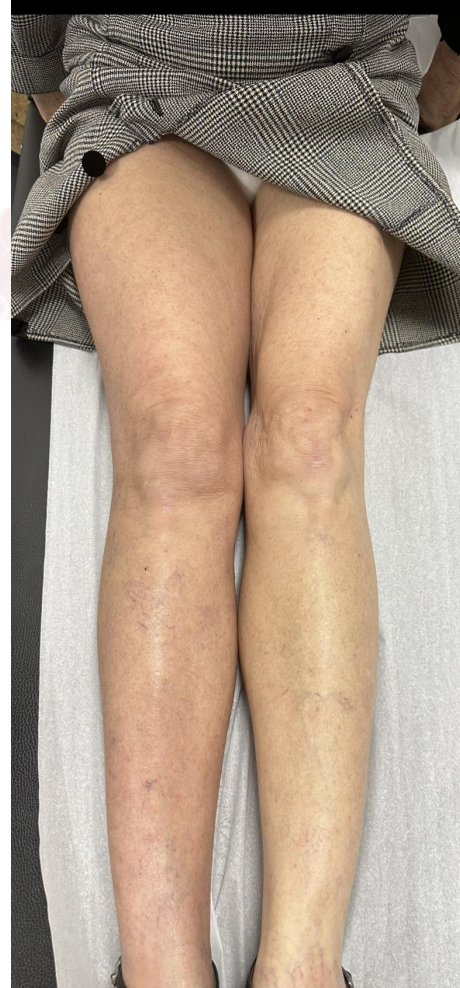
**Method and results:** EMBASE and Medline databases were interrogated to identify studies in which acute deep venous thrombosis patients were stented. Twenty-seven studies and 542 patients were identified. Primary, assisted primary and secondary patency rates 12 months after stent placement ranged from 74 to 95, 90 to 95 and 84 to 100%, respectively. The observed post-thrombotic syndrome rate was 14.6%. The incidence of stent re-thrombosis was 8%. In 26% of studies, patients received additional antiplatelet therapy. Quality of life questionnaires employed in 11% of studies demonstrating an improvement in the chronic venous insufficiency questionnaire ( $22.67 \pm 3.01$  versus  $39.34 \pm 6.66$ ).

**Conclusion:** Venous stenting appears to be an effective adjunct to early thrombus removal; however, further studies are needed to identify optimal anticoagulant regimen and effect on quality of life.

**The review describes the scarcity of robust studies on the acute venous stenting with long-term data and it alerts the physicians to enhance further studies to confirm or to disregard the recommendations given in the present paper.**

**Venous stenting for acute DVT patients appears to be an effective strategy of treatment with better patency, lower re-thrombosis and post-thrombotic rates and improved QOL of patients as well.**





## Conclusion

- Endovascular treatment plays a crucial role in specific cases of deep venous thrombosis.
- It is essential to carefully evaluate patients
- Collaborative decision-making involving vascular surgeons, interventional radiologists, and hematologists is crucial to determine the most appropriate treatment approach for each individual case.