Early Outcomes of Endovenous Cyanoacrylate Ablation for Venous Insufficiency of Lower Extremity

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Background

- **Chronic venous insufficiency (CVI)** is emerging as a potential cause of various lower extremity symptoms that were previously considered to be of spinal origin.

Objectives

- To report **symptoms** of the lower limbs that CVI may cause.
- To evaluate the efficacy and safety of **endovenous cyanoacrylate ablation (ECA)** for CVI of lower extremity superficial truncal veins.

Methods

- Patients with CVI who underwent ECA in 2022.
- Subjects with complaints of **lower extremity discomfort** and diagnosed as CVI on **duplex ultrasound (US)**.
- The prospectively collected data include,
  - At *baseline*, *2 weeks* and *3 months* post-intervention.
  - Sonographic, demographic, clinical and outcome details.
  - EuroQol-5 Dimension Questionnaire (**EQ-5D**), revised Venous Clinical Severity Score (**rVCSS**), and Aberdeen Varicose Vein Questionnaire (**AVVQ**).
  - Patient satisfaction scores.
  - Adverse events.
- Baseline **CT angiography** including 3D-CT for all patients.
- **Duplex US** exams
  - To identify **truncal venous reflux (>0.5 sec).**
  - Bilateral great saphenous veins (**GSVs**), small saphenous veins (**SSVs**), common femoral veins, popliteal veins.
  - Follow up US at 2 weeks and 3 months post-intervention.
- **Endovenous cyanoacrylate ablation (ECA)**
  - **US-guided** procedure under local anesthesia with sedation.
  - *Vein puncture* using micropuncture kit → 0.035" *guidewire* → *Blue introducer* → *delivery catheter* placement near the junction → *Glue injection* and *light compression* repeated at 3cm intervals.

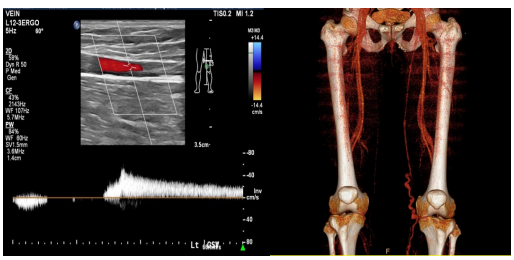

Figure 1. Diagnostic assessment of CVI: duplex US and CT angiography.

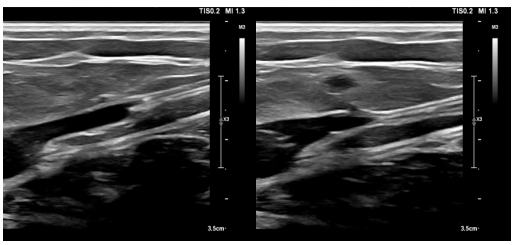

Figure 2. US exams of saphenofemoral junction before and after ECA.

Results

Table 1. Baseline characteristics, demographics, and procedure characteristics.

Characteristics	No. of patients (N=40)
Sex	
Male	14
Female	26
Age, years, mean (SD)	55.93 (10.45)
Body mass index, kg/m², mean (SD)	27.12 (4.62)
Complaining symptoms (%)	
Cramp	**27 (67.5)**
Heaviness	**26 (65)**
Swelling	**23 (57.5)**
Pain	**22 (55)**
Tingling	17 (42.5)
Tightness	9 (22.5)
Cold sense	6 (15)
Paresthesia	5 (12.5)
Squeezing	4 (10)
Heating sense	4 (10)
CEAP class (%)	
C0	5 (12.5)
C1 (reticular veins or telangiectasia)	5 (12.5)
C2 (varicose veins)	9 (22.5)
C3 (edema)	16 (40)
C4 (skin or subcutanous lesion)	5 (12.5)
C5 (healed ulcer)	0
Duration of symptoms, months, median (IQR)	36 (12-60)

Characteristics	No. of legs (%) (N=66)
Side	
Right	31 (47.0)
Left	35 (53.0)
Venous incompetence	
Superficial vein only	**58 (87.9)**
Deep vein only	0
Both superficial and deep veins	8 (12.1)
Truncal distribution of ECA	
GSV	**37 (56.1)**
SSV	17 (25.8)
Both GSV and SSV	12 (18.1)
Total No. of truncal veins treated	77
GSV	**50 (64.9)**
SSV	27 (35.1)
Technical success (%)	66 (100)
Puncture site	77
Proximal thigh	2 (2.6)
Mid-thigh	2 (2.6)
Distal thigh	19 (24.7)
Proximal calf	21 (27.2)
Mid-calf	3 (3.9)
Distal calf	30 (39.0)
Procedure time, minutes (IQR)	50 (40-65)

CEAP, Clinical, Etiology, Anatomy, and Pathophysiology; IQR, inter-quartile range; SD, standard deviation

Categorical variables are presented as number (%). Continuous variables are presented as mean (±SD) or median (inter-quartile range).

Table 2. Patient satisfaction after intervention.

Time	Number of patients	Number (%) Very satisfied	Satisfied	Neutral	Unsatisfied	Very unsatisfied
2 weeks	37	18 (48.6)	12 (32.4%)	4 (10.8%)	1 (2.7%)	1 (2.7%)
3 months	34	20 (58.8%)	10 (29.4%)	3 (8.8%)	1 (2.9%)	0

Table 3. Adverse events after intervention.

Adverse events	No.	% (N=40)
Phlebitis		
2 weeks	9	**22.5**
3 months	0	0
Ecchymosis		
2 weeks	5	12.5
3 monts	0	0

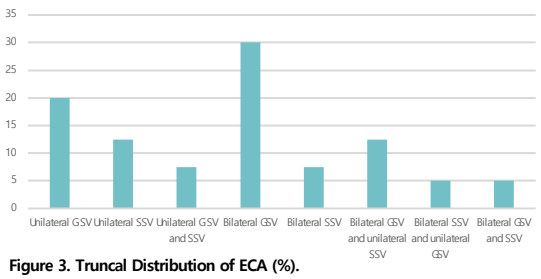

Figure 3. Truncal Distribution of ECA (%).

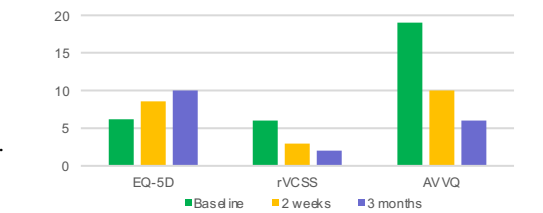

Figure 4. Clinical assessment at baseline, 2weeks, and 3 months after intervention.

Conclusions

- **ECA** is considered as an **effective and safe intervention** to manage **CVI** of lower extremity superficial truncal veins.
- Nevertheless, given the relatively high incidence of **post-procedural phlebitis**, informed consent should be obtained.
- Despite these encouraging early results, further studies elucidating long-term outcomes of ECA should be followed.