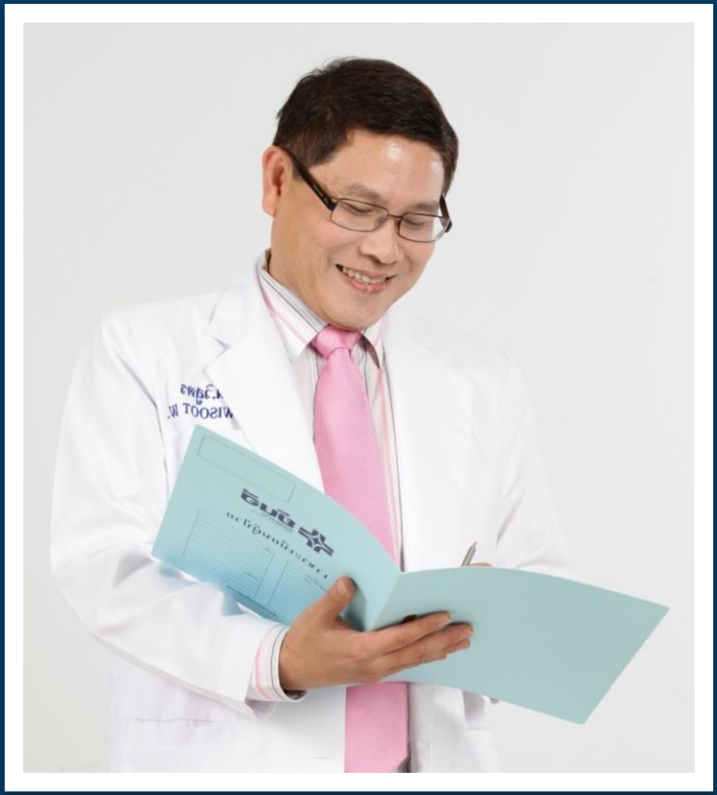
Trouble Shooting in Endovenous Treatment



Dr. Wisoot Wongklahan
Thai Phlebology Society

https://www.facebook.com/เส้นเลือดขอดรักษาได้ไม่ต้องผ่าตัด
Line ID : drwis

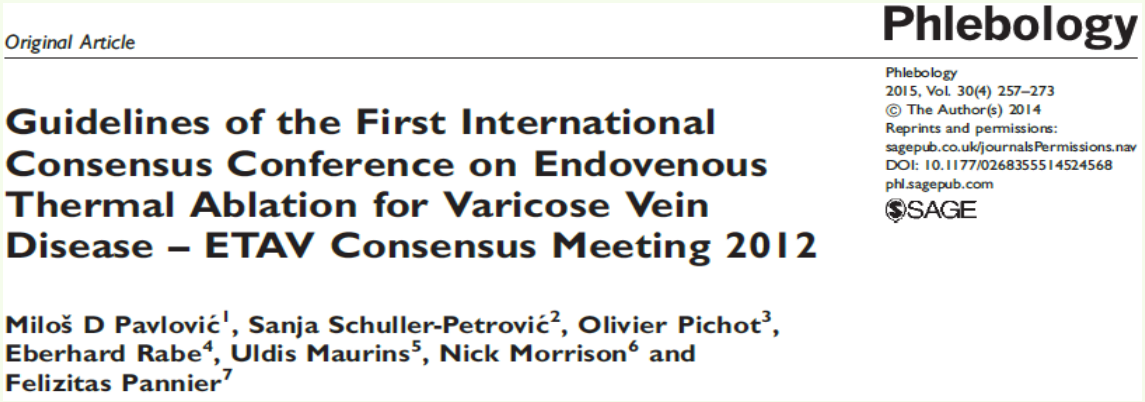
By. Vein Clinic
Thai Phlebology Society

31 JAN 2020

Trouble Shooting in Endovenous Treatment

General health condition

1. Carefully taken medical history
2. Procedure is elective so patients should be healthy (ASA I,II)
3. Patients on long-term oral anticoagulation safely treat with ETA
4. Previous operation
5. Obesity



Original Article

Phlebology

Phlebology
2015, Vol. 30(4) 257–273
© The Author(s) 2014
Reprints and permissions:
sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/0268355514524568
phl.sagepub.com
SAGE

Guidelines of the First International Consensus Conference on Endovenous Thermal Ablation for Varicose Vein Disease – ETAV Consensus Meeting 2012

Miloš D Pavlović[1], Sanja Schuller-Petrović[2], Olivier Pichot[3], Eberhard Rabe[4], Uldis Maurins[5], Nick Morrison[6] and Felizitas Pannier[7]

Trouble Shooting in Endovenous Treatment

Contraindications

Absolute contraindications

- Acute deep vein thrombosis (DVT),
- Acute superficial phlebitis,
- Acute infections at puncture sites (infection should be treated first),
- Deep venous obstruction if the vein to be treated is a functional collateral.

Relative contraindications

- Immobile or hardly ambulating patients
- Concomitant significant peripheral arterial disease with (ankle:brachial pressure index < 0.5 or an absolute ankle pressure < 60 mmHg)
- Patients unable to undergo local anesthesia
- Elevated thromboembolic risk including documented thrombophilia and history of previous DVT.
- Pregnancy
- Patients with significant uncompensated leg edema
- Uncontrolled severe diseases.

Trouble Shooting in Endovenous Treatment

Technical issues which may be viewed as relative contraindications (GRADE 1C)[65]

- Tortuous vein difficult to catheterize
- Diameter of the vein at the accessing segment < 3 mm (may be difficult to puncture and pass the catheter)
- Partly occluded venous segment (intraluminal webs, thrombosed or hypoplastic)
- Vein segment to be treated shorter than necessary for catheter placement.

Treatment Plan

Discussed with the patient about findings

- Treatment option : ½ legs, stage treatment
- Patient expectation : Recurrent, Bulging, Ulcer, Leg swelling, Hyperpigmentation, Pain
- Cost
- Risk, Side effect
- Informed consent
- Instruction for Pre-op & Post-op care/time

Trouble Shooting in Endovenous Treatment

In case Varicose vein closed to skin

- Recommendation : advise patient about Hard lump, Tenderness or cord like Presentation
- Switch to stripping or phlebectomy
- Invaginated Stripping
- Bulging Varicose Veins

Trouble Shooting in Endovenous Treatment

Equivocal Problem

- Double Saphenous
- Accessory Saphenous Vein
- Both legs VS one leg
- GSV,SSV Segmental Reflux
- Puncture Point ⟶ Above knee, below knee, ankle
- Small Saphenous vein VS Sural Nerve
- Superficial Vein and Deep Vein Reflux

Trouble Shooting in Endovenous Treatment

Operative Treatment

- Pre-medication- at home, at site – Tranquilizer
- Pre-op Antibiotics
- Anticoagulant- No guideline may be use Caprini Thrombosis risk assessment
- Mapping- again- change

Trouble Shooting in Endovenous Treatment

Canulation Trouble

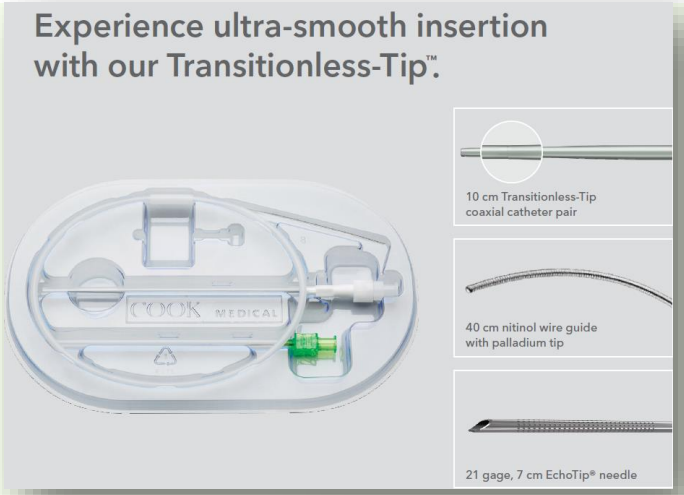
- Vasospasm (Cold environment, Anxiety)
- Exercise 10-15 minute walk,
- Position Reverse Trendelenberg Position
- Tourniquet
- Keep warm – air condition: turn off, increase temperature
  - Warm blanket
  - Warming pad
  - NTG pad


TOSHIBA
6213517:NONTACHA THANUNHIRUNLERT 66 F
YANHEE HOSPITAL - WIS - SUPERFICIAL
05/12/2019
12:54:50 PM
Precision Pure
0
1
2
3
MI:1.5
2DG
95
DR
60
18L7
diffT13.0
14 fps
A 3 IP4
HDD:91% Free

Trouble Shooting in Endovenous Treatment

Solution

- Small Diameter : micropuncture set
- Failed:move up/move down
- Reverse puncture from SFJ, SPJ
  - Sapheno femoral Junction (SFJ)
  - Sapheno popliteal junction (SPJ)
- Venous cutdown
- Tortuous Vein
  - Multiple Puncture/Double Prepuncture
  - Hand Manipulatioin, Mobilize leg
  - Flushing
- Narrowing
  - Smaller guidewire



Trouble in Tumescent Anesthesia

- Endovenous thermal ablation on Saphenous vien Relied on results and data interpretations of Klein's work on Tumescent anesthesia for liposuction.
- Perivenous space in saphenous sheath different from subcutaneous fat.

Trouble in Tumescent Anesthesia

Safety Dose

Tumescent (*Klein's Solution*)

Recipe:
1 L of normal saline (0.9% NaCl)
100 ml 1% lidocaine (10 mg/ml) = 1000 mg
1 ml (1 ampule) of 1:1,000 epinephrine (1 mg/ml) = 1 mg
10 ml of 8.4% sodium bicarbonate = 10 mEq

Final amounts in the bag (in mg):
1000 mg lidocaine
1 mg epinephrine (1 : 1,000,000)
10 mEq bicarb

Toxic Dose of Tumescent:
35 mg/kg (much more than the 7 mg/kg of local anesthetic)
So for a 70 kg person = 2,450 mg

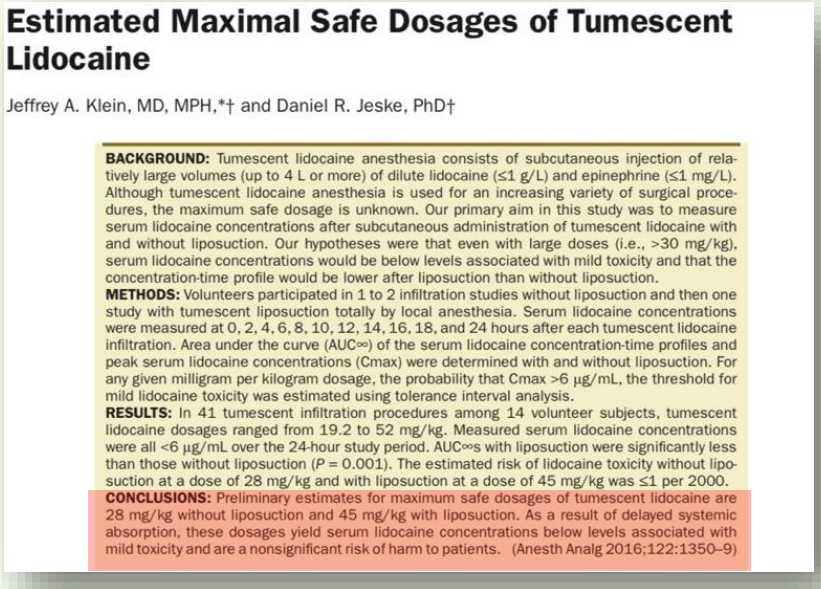
1 gm lidocaine in 1110 ml

0.09%, 0.9 gm/Litr

Trouble in Tumescent Anesthesia

Lidocaine with adrenaline safety dose

	FDA	Recommend	7 mg/kg
1989	Klein	Recommend	35 mg/kg (with liposuction)
May 2016	Klein	Recommend	45 mg/kg (with liposuction)
		Recommend	28 mg/kg (without liposuction)



Estimated Maximal Safe Dosages of Tumescent Lidocaine

Jeffrey A. Klein, MD, MPH,*† and Daniel R. Jeske, PhD†

BACKGROUND: Tumescent lidocaine anesthesia consists of subcutaneous injection of relatively large volumes (up to 4 L or more) of dilute lidocaine (≤1 g/L) and epinephrine (≤1 mg/L). Although tumescent lidocaine anesthesia is used for an increasing variety of surgical procedures, the maximum safe dosage is unknown. Our primary aim in this study was to measure serum lidocaine concentrations after subcutaneous administration of tumescent lidocaine with and without liposuction. Our hypotheses were that even with large doses (i.e., >30 mg/kg), serum lidocaine concentrations would be below levels associated with mild toxicity and that the concentration-time profile would be lower after liposuction than without liposuction.

METHODS: Volunteers participated in 1 to 2 infiltration studies without liposuction and then one study with tumescent liposuction totally by local anesthesia. Serum lidocaine concentrations were measured at 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, and 24 hours after each tumescent lidocaine infiltration. Area under the curve (AUC∞) of the serum lidocaine concentration-time profiles and peak serum lidocaine concentrations (Cmax) were determined with and without liposuction. For any given milligram per kilogram dosage, the probability that Cmax >6 μg/mL, the threshold for mild lidocaine toxicity was estimated using tolerance interval analysis.

RESULTS: In 41 tumescent infiltration procedures among 14 volunteer subjects, tumescent lidocaine dosages ranged from 19.2 to 52 mg/kg. Measured serum lidocaine concentrations were all <6 μg/mL over the 24-hour study period. AUC∞s with liposuction were significantly less than those without liposuction ($P = 0.001$). The estimated risk of lidocaine toxicity without liposuction at a dose of 28 mg/kg and with liposuction at a dose of 45 mg/kg was ≤1 per 2000.

CONCLUSIONS: Preliminary estimates for maximum safe dosages of tumescent lidocaine are 28 mg/kg without liposuction and 45 mg/kg with liposuction. As a result of delayed systemic absorption, these dosages yield serum lidocaine concentrations below levels associated with mild toxicity and are a nonsignificant risk of harm to patients. (Anesth Analg 2016;122:1350–9)

Trouble in Tumescent Anesthesia

Lidocaine safety after saphenous vein tumescent anesthesia 2019

- 35mg/kg : some toxicity/peak 60 mins
- 15 mg/kg : no toxicity/(180 mins)

Original Article

Phlebology

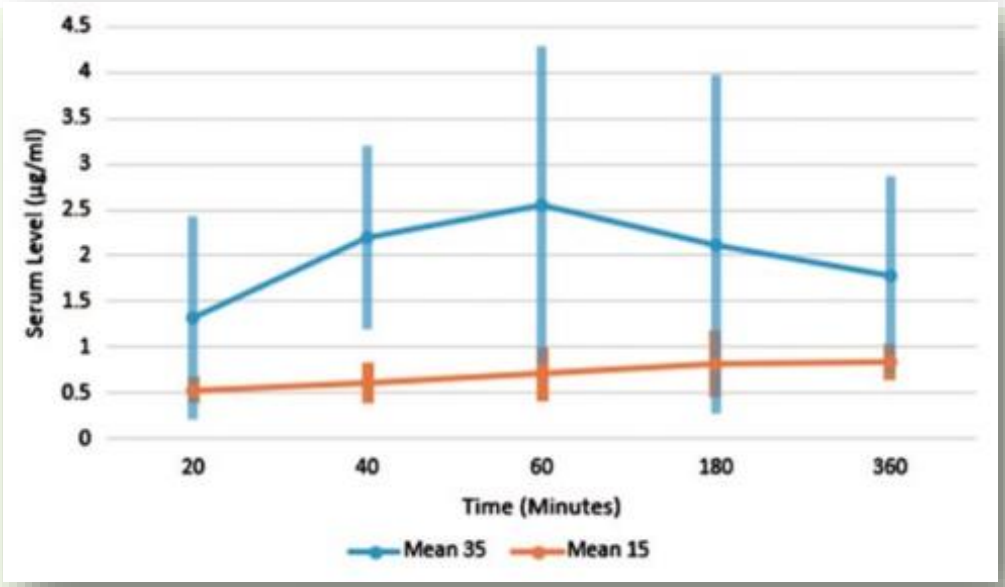
Lidocaine safety after saphenous vein tumescent anesthesia

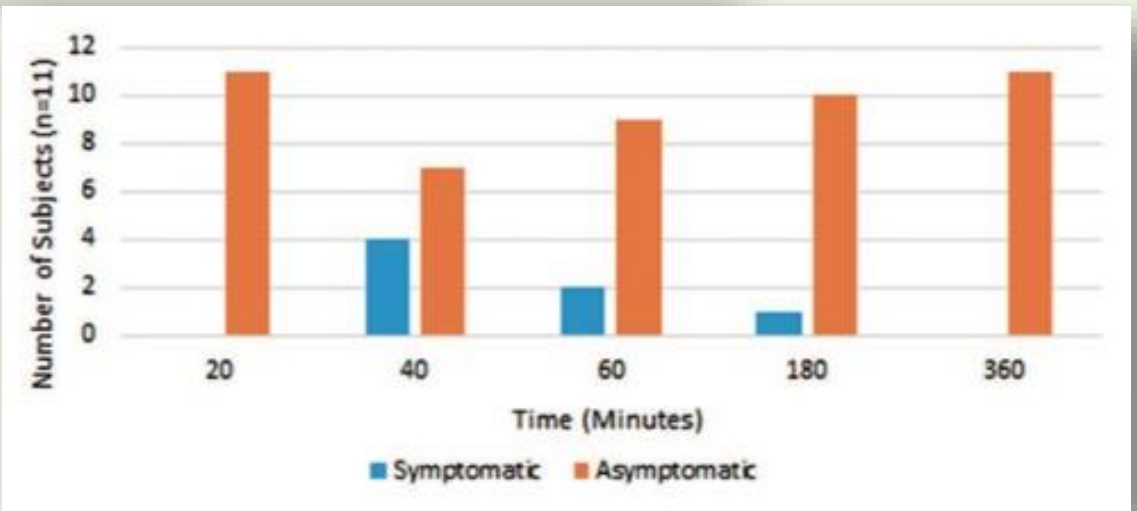
Phlebology
2019, Vol. 34(10) 683–689

DOI: 10.1177/0268355519836834
journals.sagepub.com/home/phl
SAGE

Thomas F Wright[1], Giulietta F Brunetti[2] and Patrick Kennedy[3]

Trouble in Tumescent Anesthesia





Trouble in Tumescent Anesthesia

Tumescent Anesthesia Solution

0.09% or 0.1% lidocaine (Klein Formula)

- Use 5-10 ml/cm (vein length)
- 1 GSV (thigh) 40 cm = 200 - 400 ml.
- BW 60 kg 15 mg/kg = 900 mg/900ml.
- Safety dose 1 gm/day

Conclusion

15 mg/kg is safe for normal young healthy patient

In older patient, an ASA class III↑ , need to be careful on lesser dose

Trouble in Tumescent Anesthesia

Symptoms of local anesthetic toxicity
Early neurological symptoms
Circumoral and/or tongue numbness
Metallic taste
Lightheadedness
Dizziness
Visual and auditory disturbances (difficulty focusing and tinnitus)
Disorientation
Drowsiness
Severe respiratory and cardiovascular symptoms
Hypotension
Arrhythmia
Bradycardia
Cardiac arrest
Respiratory arrest

Risk factors
Pre-existing pulmonary, cardiac, and nervous vulnerabilities.
Large dose injection
Injection around vessel-rich region
Needle or catheter placement without imaging devices
Bolus injection without aspiration test
Injection without test dosing

Trouble in Tumescent Anesthesia

Recognition of the symptoms of lidocaine toxicity

- Lack of awareness that the toxicity can occur during the vascular procedures using tumescent anesthesia.
- Lack of awareness of the symptoms of lidocaine toxicity.
- Overlap of symptoms with procedural anxiety.
- Misattribution of lidocaine to the side effects of epinephrine administration.
- Time delay from the administration of the lidocaine to the onset of symptoms.
- Lidocaine eliminate through hepatic metabolism/Enzyme CYP3A4

Treatment Record

- Technique ,Treatment time
- Power setting
- Vein Treated:location Length,Diameter
- Type of anesthesia
- Additional Procedure:Foam sclerotherapy ,Phlebectomy
- Compression
- Follow up visit

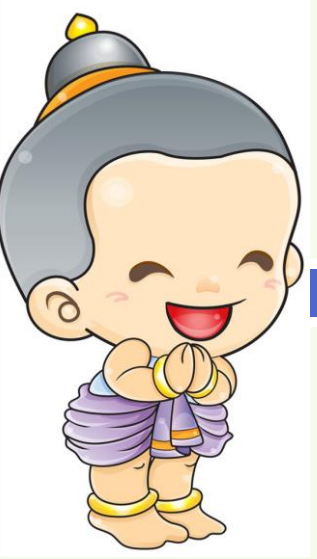
Post treatment advice

- Possible adverse event explain to Patient

  painful or swollen limbs

  Chest pain ,cough or shortness of breath

  Redness,heat or localized swelling
- Driving Immediately after treatment:not allowed
- No routine Prophylactic anticoagulant



ขอบคุณครับ

THANK YOU!