



How to manage complications after sclerotherapy?

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Disclosure

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I have the following potential conflicts of interest to report:

- ☐ Consulting
- ☐ Employment in industry
- ☐ Shareholder in a healthcare company
- ☐ Owner of a healthcare company
- ☐ Other(s)
- ☒ I do not have any potential conflict of interest

How to manage complications after sclerotherapy

- Complications can happen even to the most expert hands
- Mandatory to know what they are and how to manage them
- Early treatment can minimize sequels
- Most of them are minor
- But we must be alert and trained to react properly and immediately to serious adverse events

How to manage complications after sclerotherapy

- Serious complications: rare
 - Anaphylaxis
 - Cerebrovascular accidents
 - Venous thromboembolism
 - Tissue necrosis
 - Neurologic damage
- Minor complications: more frequent
 - Matting
 - Pigmentation

Systemic allergic reactions and anaphylaxis

- Extremely rare
- Emergency
- Unpredictable
- **Always be prepared**
repeated exposures
increases risk



immediate response

**Emergency and systemic
adverse reaction protocol**

TREATMENT OF SYSTEMIC ADVERSE REACTION AFTER SCLEROTHERAPY

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Early detection of symptoms
Injection stopped immediately

ANAPHYLAXIS Symptoms in two or more

Cutaneous
urticaria, itching
erythema,
flushing,
sneezing
angioedema

Respiratory
coughing,
hoarseness,
dyspnoea,,
wheeze, stridor

Cardiovascular
tachycardia

Alarm symptoms:

quick progression, respiratory distress,,laryngeal oedema (aphony, hypersalivation. stridor). persistent vomiting, hypotension, rhythm disturbances, syncope, confusión, sleepiness, coma

EPINEPHRINE im:
0,01 mg/kg (maximum 1 mg)

ADYUVANT THERAPY

Cutaneous symptoms:

Dexclorfeniramine 5-10 mg /8h iv

Steroids iv:

Hydrocortisone 250 mg/6 h iv
Methylprednisolone 1 mg/kg/8h iv

Respiratory symptoms:

Salbutamol
4 ug/kg bolus iv
4 Inhalations/10 min
nebulized 5 mg/3-4 h

SYNCOPE

Nausea, pallor,
diaphoresis,lightheadedness
bradycardia,
hypotension,
rhythm disturbances
loss of consciousness

Trendelenburg position
Keep the airway secure
Oxygen 100%
Access for IV fluids
Call emergency service

ATROPINE iv:
0,01 mg/kg (maximum 1 mg)

Keep the airway secure: guedel, endotracheal tube, tracheotomy

O2 100 % 6-8 l/min

0,9% sodium chloride solution or Ringer Lactate 25-30 ml/kg 10 minutes
Continuous monitoring (cardiac frequency, blood pressure, oxygen saturation)

If suspect anaphylaxis: blood sample during and 2 hours after reaction for tryptase detection

UNDERLYING MEDICAL DISEASE

Specific treatment

CARDIO-RESPIRATORY ARREST

Cardiorespiratory arrest protocol

VASOSPASM OR VENOUS GAS EMBOLISM

Specific treatment

Large tissue necrosis: Intra-arterial injection

- Extremely rare: <70 cases
- High risk injections:
 - popliteal
 - inguinal
 - medial ankle
 - medial thigh
- **Amputation 52,5%**



No consensus or evidence-based guidelines on optimal management

immediate response to prevent amputation

Intra-arterial injection treatment protocol

Hafner F 2013, Fegan WG 1974, Parsi K 2016, Nitecki SS 2007, Biegeleisen K 1993

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Intra- arterial injection treatment

- If severe pain with injection, stop the injection immediately, leave the needle unchanged, aspirate blood and remaining sclerosing solution if possible.
- Immediate IV heparin (5000-10.000 UI HNF) and continue heparin therapy at a therapeutic dosage for 6 days or longer.
- Consider immediate catheter-directed arterial thrombolysis trombolysiis.
- 500 mg Acetylsalicylic acid IV continue acetylsalicylic acid 100 mg or 325 mg daily 6 days or longer.
- Dextran 10%, 500 mL/day IV 3 days.
- systemic steroids IV for at least 48 hours Continue oral Prednisona 0.75–1 mg/kg/day (max 50 mg day) with gradual reduction over 12 weeks.
- Analgesia with NAIDs, anxiolytic therapy and consider electrostimulation therapy
- Hyperbaric oxygen

Tissue and cutaneous necrosis

- Most frequent: ulceration
- All sclerosants
- Not always a physician mistake
- Rare and limited sequelae
- Several weeks after sclerotherapy
- Pain, inflammation, edema
- 4-6 weeks to heal
- small: 4 mm



Cutaneous necrosis: extravasation

Extravasation: **immediate response**

- Vigorous massage in extravasation area
- **Dilute the extravasated sclerosant as soon as possible:**
 - Hypertonic sclerosants: huge saline solution (10/1)
 - STS 3%: Hyaluronidase



Cutaneous necrosis: Venoarterial reflex vasospasm

Treatment:

- vasodilators (**2% nitroglycerine ointment**) immediate response
- **Antiplatelets** oral
- **NSAIDS** oral
- Systemic **anticoagulant** and **steroids** if **extensive necrosis** anticipated



Cutaneous necrosis

- **Excision of the ulcer**
speeds healing and
decreases pain with
acceptable scar



Transient neurologic events: visual disturbances and migraines

- **Nonspecific treatment:**
 - **Neurologic evaluation** and, DVT, PE and RLS screening
 - **Trendelenburg position** and **100% oxygen**
 - Headaches: **analgesia** and triptans in selected cases



immediate response

Ischemic neurological events: TIA and stroke

- TIA:
 - 5 published, all RLS, all after foam, and immediate onset
- STROKE:
 - 0,01%
 - 13 published cases:
 - RLS (FOP) etiologic factor most frequent
 - 4 after liquid, 9 after foam
 - 3 partial recovery, 9 total recovery
 - Immediate (paradoxical gas embolism)
 - With a delayed onset (paradoxical clot embolism)
 - 3/13 patients no gas, no clot discovered

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TIA o STROKE after foam with early onset

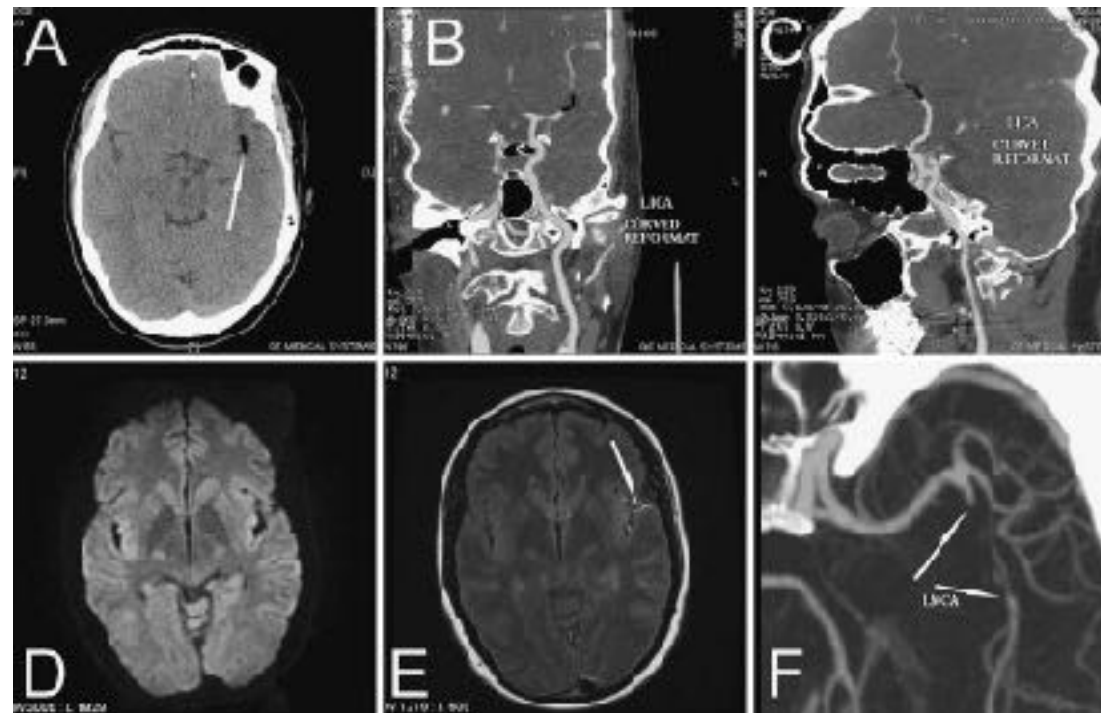
Paradoxical gas embolism treatment

immediate response

- 100% Oxygen immediately
- Place the patient in a head-down position for up to 10 minutes to clear bubbles from the cerebral circulation
- Confirm gas bubbles in arterial circulation by images tests as soon as possible
- Transfer the patient to a hyperbaric chamber
- Anticoagulation heparin IV with PTT >2
- Consider thrombolysis therapy with tissue plasminogen activator in selected cases
- If FOP, closure in a second step

TIA or STROKE after foam with early onset

- Paradoxical gas embolism **confirmed by imaging of bubbles in the intracranial arterial circulation** as soon as possible



TIA or STROKE after foam with early onset

- **Hyperbaric oxygen therapy:**
 - Controversial results
 - No routine use



TIA or STROKE with delayed onset

Paradoxical clot embolism treatment

- STROKE guidelines recommendations
- Thrombolysis in selected cases

Venous Thromboembolism

- $<3\%$
- Most asymptomatic and located in lower leg



Venous Thromboembolism

- Treatment:
No evidence based recommendations
Depends on risk factors and extension of DVT
- Distal non occlusive DVT without risk factors has benign evolution with rapid recanalization:
ambulation and **compression**, or **NSAIDS** or **short LMWH** or
follow-up with ecodoppler
 - Proximal DVT:
oral anticoagulation 3-6 months
look for risk factors for DVT

Superficial venous thrombosis

- Part of the process more than a complication
- Complication if there is an extension beyond the treated area or an excessive inflammation
- Incidence depends on individual understandings so highly variable (0-45,8%)



Superficial venous thrombosis

- **DVT screening**

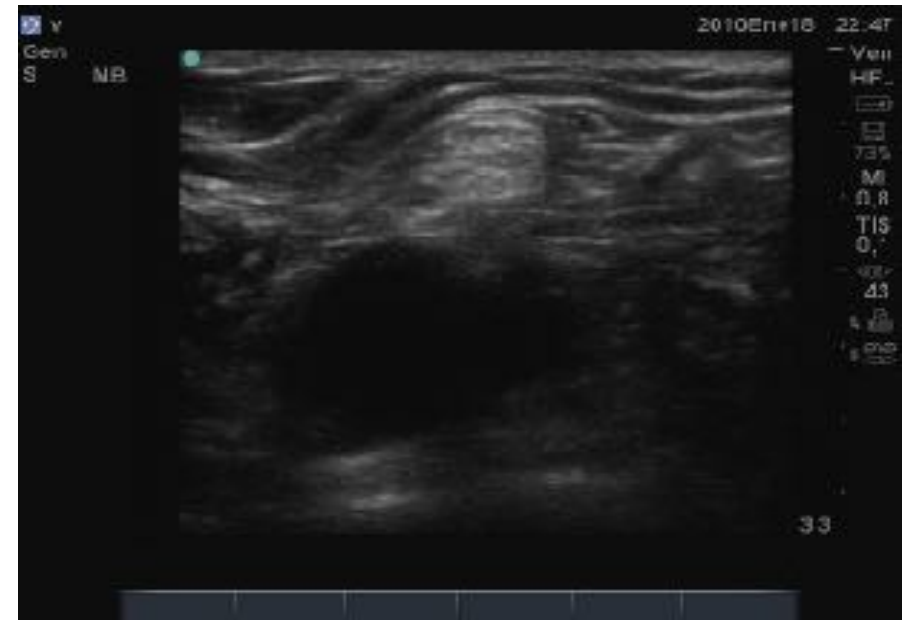
Treatment:

- Minor (most frequent): no treatment or coagula extraction
- Symptomatic:
 - **coagula extraction**
 - **ambulation**
 - **compression**
 - **NSAIDS**
 - **LMWH if extensive** or **affects SFJ**



Nerve injury

- Very rare (0,02%)
- Sural and saphenous nerve
- Popliteal fossa and leg
- Transient paresthesia and dysesthesia (can last 6 months)



Dr. Pérez Monreal photo

Treatment:

- **NSAIDS** in minor cases
- **Neurotropic agents in long-term**
- **Local infiltration with steroids and anesthetics**

Matting

- Treatment technics:
 - no treated underlying reflux
 - high concentration, volume or pressure injection:
 - inflammatory reaction or excessive vein obstruction with angiogenesis
- Risk factors:
 - obesity, female, women, estrogens treatment, long duration of spider, family history of telangiectasia



Matting

- **Look for** and **eliminate underlying reflux** and residual veins with non-inflammatory sclerotherapy or phlebectomy



- **If no underlying reflux: Wait**
 - better than multiple treatments with stronger liquid sclerosants
 - mild anti-inflammatory cream **and follow up with photos** until resolution

Residual pigmentation

- 3-4 weeks of sclerotherapy
- 10-30% short term
- 70% resolution at 6 months
- 10% >1-2 year
- Combination of hemosiderin (extravasated red cells) and melanin pigment (inflammatory process)



Residual pigmentation



- Look for **underlying reflux** and **eliminate it**



Munavalli GS 2007, Palm MD 2010, Rabe E 2014

Residual pigmentation

- **Extracting intravascular coagulum** expedites resolution



Kern P 2007, Scultetus AH 2003

Residual pigmentation

- **Compression:**
 - anti-inflammatory effects, decrease chronic venous hypertension and helps coagula resolution



Residual pigmentation

- **Time** is the first line of treatment
 - Most patients spontaneous resolution within the first year



Residual pigmentation

Bleaching agents that affect melanocytic usually ineffective

Exfoliation with mild peeling agents
Chelation of the subcutaneous iron deposition
Q-switched laser therapy and **intense pulse light**

can help



Transitory general effects

- Chest tightness, dry cough, nausea and a metallic taste
- Treatment similar to transitory neurologic disturbances:
 - **Trendelenburg position**
 - **100% O2 therapy**
 - **Evaluate neurologic and cardiovascular state**



immediate response

Conclusions

Serious adverse events are very rare:

- there are no evidence-based recommendations to manage them
- most treatment options are based on anecdotal experience or data extrapolated from others pathologies

Conclusions

- EMERGENCY PLAN :
 - Neurologic deficit
 - Intra-arterial injection
 - Systemic adverse reaction or anaphylaxis
- TRANSPORT TO EMERGENCY SERVICES
- ACCESS TO HYPERBARIC THERAPY
- OXYGEN THERAPY

How to manage complications after sclerotherapy

- Minor complications require:
 - Time
 - Follow-up by the practitioner
 - Adherence with post-sclerotherapy treatment by the patient

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