Sclerotherapy of low-flow vascular lesions

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Low-Flow malformations
- Lymphatic malformations
- Venous malformations

Sclerotherapy
- Early 1900’s
  - Esophageal varices
  - Varicose veins

Sclerotherapy for low-flow VM
- Cosmetics
- Pain relief
- Functional improvement
- Can have long-lasting control
- Not curative…

Does not alter natural history
How Sclerotherapy Works...

- Damaging endothelium
- Fibrosis
- Reduction in size of lesions

Principle of Sclerotherapy

...contact with endothelium for sufficient time to cause damage

Choice of agent - hemodynamics

Fast Flow  No-Flow

Sclerosing agents in decreasing strength

- Ethanol
- Detergents
  - Sodium tetradecyl sulfate (STS)
  - Polidocanol
  - Sodium morrhuate
  - Ethanolamine
- Doxycycline
- Bleomycin

Lymphatic Malformation

- Doxycycline
- Bleomycin

- Contrast study
- Sclerosant
- (1/2 initial volume)
- Pull needles

Lymphatic Malformation
6 y/o with bulging neck mass

Doxycycline
Removed pigtail

Macro vs. Microcystic

T2 + Gad

6 y/o with LM

Macro and microcystic

Sclerosis with Doxycycline (300 mg)

2 mos after sclerotherapy
Venous Malformations

Sclerotherapy

My drug of choice: STS

Puig Classification

Alter the hemodynamics

Block outflow veins
  - Tourniquets
  - Direct pressure

Embolization

Coils

Why I don’t like Foam

STS and air quickly separate
  - Explosive injection
  - Air embolism (PFO)

Foam does allow less drug

Coils
Repeat interval injections
STS 3%
Plus 10 minutes

Bleomycin
- Antibiotic derivative with cytostatic properties
- Less immediate inflammatory reaction
- Eyes
- Airway
- Perineum
- Pulmonary toxicity
- No documented instances (>2000 uses)

All sclerosing agents work!
- Review of 1155 publications
  - Complete response 39-79%
  - Excellent response 70-100%

Misadventures
8 y/o girl with LM left face
- Incorrect diagnosis

Complications
- Skin necrosis
- Nerve damage
- Systemic effects


12 weeks later
High-grade malignant sarcoma

Doxycycline
Microcystic LM

Doxycycline

Combined US and fluoroscopic contrast

Immediately following procedure

9 y/o boy had foot pain during Karate

1.0 cc sodium tetradecyl sulfate

Sclerosing agents

- Complications can occur with all
  - 18% ethanol
  - 0-6% all others

Conclusions

- Sclerotherapy has become the primary method of treatment for Low-Flow VM
- Match agent with the lesions
- All sclerosing agents work
- Use all agents with caution

Thank You!

All agents work
1155 articles reviewed

- All sclerosants effective
  - Complete response 39-79%
  - Excellent response 70-100%