Ethanol Ablation of Venous Malformations of the Chest, Abdomen and Buttocks

Krassi Ivancev, University Hospital Eppendorf, Hamburg, Germany

Wayne F. Yakes MD, FSIR, FCIRSE
Director
Vascular Malformation Center
Englewood, Colorado, USA

Disclosure

• Cook Medical Inc.
  - Consultant
  - Patent licenses/Royalties
  - Research funds
  - Travel expenses

Symptomatic venous & lymphatic malformation can be percutaneously accessed
  – Ablation with ethanol is effective

43 female
Enlarging right chest wall venous malformation
6 male
Left gluteal venous malformation

Direct puncture spot film demonstrating contrast filling of a large VM compartment. Note the extravasation. The 21g needle was repositioned into the VM to inject ETOH without extravasation.
- Low flow malformations difficult to distinguish venous from lymphatic
  - Not uncommon to be combined

- 11 male
- Worsening diffuse abdominal pain
  - Increasing frequency & intensity
Direct puncture angiograms of LMs can have similar angioarchitectures to VMs. But lymph fluid confirms the diagnosis.
Wayne F. Yakes MD, FSIR, FCIRSE
Vascular Malformation Center
Englewood, Colorado, USA


Procedures & Complications

Totals
Jan 2002 - Dec 2007

- Head to Toe Vascular malformations
- 1,367 Patients
- 6,798 Procedures

Wayne F. Yakes MD, FSIR, FCIRSE
Vascular Malformation Center
Englewood, Colorado, USA


Procedures & Complications

Totals
Jan 2002 - Dec 2007

- VM : AVM, >2:1 ratio
- H&N 318
- UE 271
- LE 531
- Chest/Abd 105
- Pelvic/Buttock 147
**Totals**

Jan 2002 - Dec 2007

Over 120,000 ml ETOH Used in 6,798 Procedures

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**Complications**

6,798 Procedures 2002 - 2007

**Transient – 5%**

- Minor blisters: 69
- Transient nerve injury: 37
- Limited DVT: 20
- Infection: 52
- DIC: 1

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**Complications**

6,798 Procedures 2002 - 2007

**Major – 0.4%**

- DVT: 4
- PE: 3
- Amputation: 2
- Pneumothorax: 1
- GI Bleed: 1
- C-P Arrest: 3
- Skin Graft: 3
- Permanent Nerve Injury: 1

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"To summarize, intravascular ethanol levels lead to acute hemolysis and the release of free hemoglobin. The free hemoglobin, not cleared by the hemoglobin scavenging systems, initiates an acute decrease in pulmonary endothelial nitric oxide levels. This precipitates an acute increase in pulmonary vascular resistance and a rise in pulmonary pressure."

"The total dose of ethanol per treatment session should be limited to 0.5-1 ml/kg, with very close observation of the physiologic parameters if more than 2-3 ml is being injected at any one time."

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Acute cor pulmonale and right heart failure complicating ethanol ablative therapy: Anesthetic and Radiologic Considerations and Management

Bilhas Nahi - Alver H. Mannino

"Acute cor pulmonale and right heart failure complicating ethanol ablative therapy: Anesthetic and Radiologic Considerations and Management" [CIRSE]
To reduce hemodynamic complications, the minimum therapeutic amount (0.14 mL/kg body weight) of 100% ethanol is recommended for bolus intravascular injection.

Endovascular treatment combined with embololysis therapy for public arteriovenous malformations.

Conclusion

- Ethanol ablation effective for low flow venous / macrocystic lymphatic malformation
- Permanent cure can be achieved with staged procedures
- Complications can be avoided
  - Controlled delivery and dose