Complex AVM Curative Endovascular Treatment at the SMC: The Korean Experience

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Nothing to Disclose

Congenital Vascular Malformations

- N=2,211 patients
- Distribution of AVM %
  - Extremity: 52%
  - Upper: 24%
  - Lower: 28%
  - Head & neck: 29%
  - Trunk: 17%
  - Chest: 5%
  - Abdomen: 8%
  - Pelvic*: 4%
  - Multifocal: 2%

Indications for Treatment of AVMs
- Clinical symptoms that make daily life uncomfortable (pain, disfiguring mass, limb swelling)
- Patients with complications (ulcer, focal skin necrosis, hemorrhage, limited joint movement)
- Progressive enlarging AVMs
- Patients with or expecting to have cardiopulmonary complications (dyspnea, cardiomegaly, or overt heart failure)

Symptoms & Signs of Extremity and Trunk AVMs
- Pain, pulsating mass
- Swelling
- Ulceration, bleeding (5%)
- Bone overgrowth, destruction (18%)
- Congestive heart failure (5%)

Treatment of AVMs
- Aggressive control of the lesion nidus
  - Ethanol
  - Coils
- Treatment approach
  - Intra-arterial or trans-venous
  - Direct puncture
Type I Renal AVM: Coil Embolization

F/42, Detected at routine health check-up

Direct puncture + intra-arterial approach

AVM with congestive heart failure

Case 4: F/61 with dyspnea

Selective angiography
Before treatment

After one session of Tx

Eight sessions of treatment
Results

- Therapeutic outcome (n=176)
  - cure 39%
  - partial response 51%
  - no response or failure 10%

- Number of treatment session
  - one to three 75%
  - more than three 25%

- Positive influence on clinical outcome
  - localized ($p = 0.002$)
  - type I or II ($p = 0.001$) Park KB, Do YS, et al. JVIR 2012

Limitations of Embolotherapy

- Contraindication (5-10%)
  - Infection
  - Non-functioning extremity
  - AVMs with diffuse skin involvement
  - Diffuse involvement of the hand or foot

- Difficult Case (5%)
  - Rapidly growing AVMs
  - Aneurysm at the feeding artery
  - Diffuse involvement of the entire extremity

M/33, Skin ulceration and bleeding

F/16
Leg pain, knee contracture
On a wheelchair
Onset: 11 years ago
F/U CT angiography after AK amputation

Before Tx
Residual AVM lesion 6 months after A-K amputation
After embolization of residual AVM

M/23 with AVM at the entire U/E

2007-Aug

F/S2 with foot pain

F/52 with foot pain
Final Result

AVM with diffuse skin involvement

F/11: buttock AVM with skin involvement
Complications of Ethanol Embolotherapy

- 45% of overall complication rates (76/176)
- 35% of minor complication
  - Localized skin blister or skin necrosis (46/176)
  - Transient nerve palsy (4/176)
  - Finger joint stiffness (2/176)
- 10% of major complications
  - Skin necrosis required skin graft (2) or escharctomy (3)
  - Finger amputation (3) and limb amputation (1)
  - Thrombolysis for distal embolism (3)
  - Permanent nerve injury (1)
  - Pancreatitis (1) and ARF (1)

Park KB, Do YS et al. JVIR 2012
Conclusions

- Ethanol embolotherapy of complex AVMs
  - Effective in more than 90% of the patients
  - More than three sessions of treatment in 25%
  - Therapeutic outcomes of localized or type I and type II AVMs were better than other types
  - Relatively high complication rates

Thank You for Attention