Successful percutaneous management of massive active bleeding from the ulcerated skin in two cases of complex AVM

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Disclosure

Speaker name: F. Gonca Eldem

I have the following potential conflicts of interest to report:

☐ Consulting
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)

X I do not have any potential conflict of interest
Introduction

- **AVMs;** abnormal connections between arteries and veins
- Disturbance of angiogenesis
- High flow
- Central nidus
- No capillary bed
ISSVA classification for vascular anomalies ©
(Approved at the 20th ISSVA Workshop, Melbourne, April 2014, last revision May 2018)

This classification is intended to evolve as our understanding of the biology and genetics of vascular malformations and tumors continues to grow.

Overview table

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<td>Combined *</td>
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<td>Arteriovenous malformations*</td>
<td>others</td>
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<td>Arteriovenous fistula*</td>
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* defined as two or more vascular malformations found in one lesion
* high-flow lesions

A list of causal genes and related vascular anomalies is available in Appendix 2

The tumor or malformation nature or precise classification of some lesions is still unclear. These lesions appear in a separate provisional list.

For more details, click on the underlined links.

Abbreviations used
**Schobinger Classification**

Stage 1: Pink-bluish stain, warm  
*Doppler: AV shunting*
Stage 2: Pulsation, thrill, bruit
Stage 3: Dystrophic skin changes, bleeding, ulceration, pain
Stage 4: High out-put cardiac failure

**Angiographic Classification**

- **Type 1**: Arteriovenous fistula  
  - ≤3 arterial feeders supplying a single vein)
- **Type 2**: Arterioloovenous fistula  
  - Multiple arteries shunt into a single dilated vein
- **Type 3**: Arteriovenulous fistula  
  - Multiple shunts between arterioles and venules  
  - 3a-nondilated  
  - 3b- dilated

*Cho SK, et al. J Endovasc Ther 2006*
Case 1

- 29 y, F
- Right lower extremity complex AVM
- Skin involvement (+)
- Ulcer (+)
- Bleeding (+)
- History of embolization, outside center
• Change strategy
• Percutaneous approach

• The drape was taken out
• MASSIVE EXPULSIVE BLEEDING!!!
  – From the ulcer site
nBCA-lipiodol (1:2)
1st month follow up
Case 2
Case 2

- 25 y, M
- Complex chest AVM
- Skin involvement (+)
- Ulcer (+)
- Bleeding (+)
- History of previous embolization + sclerotherapy
Transarterial sclerotherapy + embolization
1 week later
1st month follow up

After 20 Gy ERT
Discussion

• Treatment requires TEAM work
• Staged therapy
• IR treatment
  – Transarterial
  – Percutaneous
  – Transvenous
  – embolization
  – sclerosants

  Target the nidus+draining vein

Combination
Conclusion

• Direct puncture complementary to endovascular
  – Emergency massive bleeding
  – tortuosity of the arterial feeder precludes juxtanidal positioning
  – unable to achieve proper positioning of the catheter in very complex AVMs

• Manual compression of the draining vein or a blood pressure cuff should be employed when possible

• Experience is needed to provide a controlled flow with liquid embolics.
Thank you...
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