Giant High flow AVM: Is It disturbing dream ? case scenario

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Disclosure

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I do not have any potential conflict of interest
A diagram for the four types of AVMs based on nidus morphology

- **Type I** (arterio-venous fistulae) AVMs: No more than three separate arteries shunt to the initial part of a single venous component.

- **Type II** (arteriolo-venous fistulae): Multiple arterioles shunt to the initial part of a single venous component, in which the arterial components show a plexiform appearance on angiography.

- **Type IIIa** (arteriolo-venulous fistulae with nondilated fistula): Fine multiple shunts are present between arterioles and venules and appear as a blush or fine striation on angiography.

- **Type IIIb** (arteriolo-venulous fistulae with dilated fistula): Multiple shunts are present between arterioles and venules and appear as a complex vascular network on angiography.
Methods of treatment

• Embolization.

• Surgical extirpation.

• A combination of these modalities.

• Transarterial, transvenous catheterization using a coaxial catheter, and/or percutaneous direct puncture was needed to reach the nidus being embolized.

• When focusing only on the morphology of the nidus, the type I and II AVMs can be embolized through any of the three approaches: transarterial, transvenous, or direct puncture approaches.
• Embolotherapy has been a primary mode of treatment for the management of AVMs

• With improvements in catheter systems and selective techniques, which can be achieved through the transarterial, transvenous, or direct puncture approaches.

• Inadvertent embolization must be avoided by superselective catheterization or direct puncture of the nidus.
• The therapeutic outcomes were assessed according to symptoms and signs and degree of devascularization at angiography.

• Cure was defined as complete resolution of clinical symptoms and signs, with 100% devascularization of AVMs at angiography.

• Partial remission was defined as complete resolution or an improvement in clinical symptoms and signs, with 50-99% AVM devascularization at angiography.
• No remission was defined as no change in clinical symptoms and signs, with less than 50% devascularization at angiography.

• Aggravation was defined as a worsening of clinical symptoms and signs, regardless of the degree of AVM devascularization at angiography.

Microcatheters:

• very distal delivery of the agent.

• provide an important safety margin.
Technique of Glue Embolisation

The two general techniques are used:

1. The push technique:
   - sometimes called sandwich or bolus technique.
   - involves injecting a volume of glue smaller than the capacity of the microcatheter.
   - followed by an injection of 5% dextrose in sterile water solution.

2. The continuous column technique:
   - consists of injection of dextros 5% through the catheter followed by adhesive injection continuously.
   - The potential advantage
   - larger volumes of embolizing material could be used.
Male patient aged 20 yrs old. Presented with left submandibular region AVM, recurrent alveolar bleeding 5 years ago.

CTA showed arterial feeders from superficial temporal and maxillary branches of ext carotid artery and drainage into IJV.
Operative technique

• Lt femoral artery access with 5fr sheath

• 0.035 guide wire introduction over a guiding catheter (4fr) till ECA

• Diagnostic angiography was obtained

• 5 fr Bern catheter was advanced over guide wire

• 0.035 guide wire was exchanged with 2.7 fr marathon microcath over 0.014 guide wire
• Microcath was advanced through maxillary artery feeders then onyx 18 was prepared using shaker for 20 min.

• DMSO 0.5 ML was injected through microcath then onyx was injected at a rate of 0.1ml / min into the nidus.

• Three vials of onyx were needed to occlude the nidus.

• Finally angiography revealed complete nidus occlusion.
Case Scenario 2

- Male patient 18 yrs old with left auricular and submandibular AVM
- Previous hx of surgical excision 2 yrs ago
- Previous hx of endovascular embolization 1 year ago
- He complains of recurrent pulsatile swelling and bleeding per gum
- Palpable thrill over lt auricle and harsh sound due to turbulence of blood flow through the AVM disturbing patient's sleep
CTA showed AVM with arterial feeders from post auricular and fascial artery branches of ECA
Operative technique

- Lt femoral artery access with 5fr sheath
- 0.035 guide wire introduction over guiding catheter (4fr) till ECA
- Diagnostic angiography was obtained
- 5 fr Bern catheter was advanced over guide wire
- 0.035 guide wire was exchanged with 2.7 fr marathon microcath over 0.014 guide wire.
Post operative CTA revealed successful occlusion of Arterial feeders.
Conclusion

• High flow AVM is a hazardous vascular problem bearing high incidence of morbidity and even mortality for the patients due to massive haemorrhage.

• Unfortunately, surgical interference usually failed to solve this problem because of high incidence of recurrence after surgical ligation of arterial feeders.

• Endovascular embolization by different occluding materials is a good option for treatment of these challenging cases specially in recurrent cases after surgery.
• It is safe, durable, and can be repeated to get optimum results but it needs good training with increasing the learning curve for the interventionalist to improve the hand skills.

• Good selection of patients, careful planning for the procedure, perfect selection of the tools and embilizing materials are the secrets of success.
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