Concepts and Techniques in Oncologic and Non-Oncologic Embolizations

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Disclosures

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I have the following potential conflicts of interest to report:

- Consulting:
  - Boston Scientific
  - Abbott Vascular
  - Johnson&Johnson/Cordis
  - Merritt Medical
Categories of Embolization

- Vascular malformations
- Traumatic and non-traumatic bleeding
- Non-oncologic tissue ablation
- Oncologic embolizations
- Flow redistribution
- Endoleak management
Vascular Malformations
Aneurysms and Pseudoaneurysms

Concept

- Filling of aneurysms
- Saving critical parent artery

Technique

- Coil packing
- Stent-remodelling
- Occlusion of front and back dor

Embolization of aneurysm by 2.5 m detachable FIDC microcoils (BSC)
Vascular Malformations
Aneurysms and Pseudoaneurysms

Concept

- Filling of aneurysms
- Saving critical parent artery

Technique

- Coil packing
- Stent-remodelling
- Occlusion of front and back dor

Embolization by 300 mm detachable fibered microcoils
Remodelling by 5 mm/30 mm Nitinol SE Stent
Vascular Malformations
Aneurysms and Pseudoaneurysms

Concept

- Filling of aneurysms
- Saving critical parent artery

Technique

- Coil packing
- Stent-remodelling
- Occlusion of front and back dor

Embolization by three pushable fibered microcoils
Vascular Malformations
Hemangioma, AVM, AVF

Concept

• permanent occlusion
• nidus
• feeding arteries

Technique

• liquid embolics
  glue, alcohol, Onyx®, Fill®
• Coils
• plugs
Vascular Malformations
Hemangioma, AVM, AVF

Concept
- permanent occlusion
- nidus
- feeding arteries

Technique
- liquid embolics
  - glue, alcohol, Onyx®, Fill®
- Coils
- plugs
Vascular Malformations
Hemangioma, AVM, AVF

Concept

- permanent occlusion
- nidus
- feeding arteries

Technique

- liquid embolics
  - glue, alcohol, Onyx®, Fill®
- Coils
- plugs

Post-Biopsy transplant kidney AVF

Occlusion by three 4 mm microcoils
Vascular Malformations
Hemangioma, AVM, AVF

Concept

- permanent occlusion
- nidus
- feeding arteries

Technique

- liquid embolics
  - glue, alcohol, Onyx®, Fill®
- Coils
- plugs

Recurrent cerebral infarctions

Occlusion of feeding artery by 7 x 10 mm Amplatzer vascular plug
Bleeding traumatic and non-traumatic

**Concept**
- occlusion of feeding Aa.
- temporary in critical Aa.
- permanent in critical pts.

**Technique**
- superselective cathx.
- Coils
- particles
- Gelfoam

Gross hematuria after trauma

selective embx. 3 mm pushable microcoils
Bleeding
traumatic and non-traumatic

**Concept**
- occlusion of feeding Aa.
- temporary in critical Aa.
- permanent in critical pts.

**Technique**
- superselective cathx.
- Coils
- particles
- Gelfoam

**Acute lower GI bleeding**
- selective embx. 3 mm pushable microcoils
Bleeding traumatic and non-traumatic

Concept

- occlusion of feeding Aa.
- temporary in critical Aa.
- permanent in critical pts.

Technique

- superselective cathx.
- Coils
- particles
- Gelfoam

Sarcoma with gross episthaxis

non-spheric PVA-particles 350-500 um
Tissue Ablation

Concept

• total devascularization
• ischemic tissue shrinking
• UFE, prostate, spleen, kidney

Technique

• superselective cathetx.
• flow directed embx.
• appr. sized particles
• glue

benign prostate hyperplasia

spheric particles 300-500 um

courtesy: F. Carnevale, CIRSE 2014
Tissue Ablation

**Concept**
- total devascularization
- ischemic tissue shrinking
- UFE, prostate, spleen, kidney

**Technique**
- superselective cathex.
- flow directed embx.
- appr. sized particles
- glue

trx.-resistant nephrotic syndrome

Butyl-cyanoacrylate-iodized oil 1:3
Palliative Oncologic Embolization

Concept

- local drug delivery
- regional advantage
- embx. of feeding Aa.
- ischemic hypoxia

Technique

- selective/semiselective cathx.
- coaxial microcatheters
- drug & embolics: DEB-TACE
- Drug prior to embolics: cTACE

Colorectal cancer liver metastases

200 mg Irinotecan loaded into 100mg HepaSphere microspheres 100-450 μm
Palliative Oncologic Embolization

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- local drug delivery
- regional advantage
- embx. of feeding Aa.
- ischemic hypoxia

Technique

- selective/semiselective cathx.
- coaxial microcatheters
- drug & embolics: DEB-TACE
- Drug priot to embolics: cTACE

Hepatocellular carcinoma

100 mg Doxorubicin, 4 cc beads 150-300μm
Palliative Oncologic Embolization

Concept

- local drug delivery
- regional advantage
- embx. of feeding Aa.
- ischemic hypoxia

Technique

- selective/semiselective cathx.
- coaxial microcatheters
- drug & embolics: DEB-TACE
- Drug prior to embolics: cTACE

Hepatocellular carcinoma nodular type

60 mg Epirubicin, 10 cc iodized oil, PVA 150-300μm
Preop. Oncologic Embolization

**Concept**

- tumor devascularization
- minimizing i.o. blood loss

**Technique**

- complete occlusion of tumor- or organ-feeding Aa.
- coils, glue, particle

T3 Renal cell cancer preoperatively

Complete renal devascularization by 4 cc cyanoacrylate-iodized oil (1:3) mixture
Preop. Oncologic Embolization

Concept
- tumor devascularization
- minimizing i.o. blood loss

Technique
- complete occlusion of tumor- or organ-feeding Aa.
- coils, glue, particle

Juvenile pharyngeal fibroma (18 a, m) preop.

PVA 350-550 µm
Flow Redistribution

**Concept**

- direct flow via vessels of choice
- Induction of tissue hyperplasia
- obviate bleeding

**Technique**

- occlusion of portal veins
- transhepatic access
- transjugular access
- coils, particles, glue

Right portal vein embx. to induce left liver lobe hyperplasia prior to right liver lobe resection

PVA 350-550 µm, 660 mm FIDC microcoils
Flow Redistribution

Concept

• direct flow via vessels of choice
• Induction of tissue hyperplasia
• obviate bleeding

Technique

• occlusion of portal veins
• transhepatic access
• transjugular access
• coils, particles, glue

Redirect portal vein flow from gastric coronary vein vein via TIPS shunt to systemic circulation

1.5 cc butyl-cyanoacrylate-iodized oil 1:3 mixture
Endoleak Management

Concept

- type Ib and II endoleaks
- occlusion of feeding Aa.

Technique

- Superselective cathx.
- Coils
- glue
Endoleak Management

**Concept**
- type Ib and II endoleaks
- occlusion of feeding Aa.

**Technique**
- Superselective cathx.
- Coils
- glue

450 mm FIDC microcoils; 5 cc Onyx
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