„Emergency coiling procedures for acute bleeding – tips and tricks“
Disclosure

Speaker name: Boris Radeleff

I have the following potential conflicts of interest to report:

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

I do not have any potential conflict of interest
Technical Background
Goal of the embolisation due of a bleeding is to induce a thrombosis to occlude a bloodvessel by decrease of a blood-flow and thrombosis.

The choice of the embolic agent depends on bleeding localisation, severity and coagulation function.
Embolisation Technique

P. Landwehr et al. Radiologe 2008

Choice of the embolisation agent:

- Effect of embolisation: permanent vs. temporarily
- Status of coagulation: plus glue/Lipiodol
- Depth of embolisation: arterioles, pre-capillary, venous
- Indications: curative, palliative, pre-operative, EM
- Alternatives: stentgraft, balloon-occlusion⇒OP?

Individual experiences of the IR with the embolisation agents
Metallic Coils

Occlusion: medium to small arteries (Micro/Makro, Nester)

Advantages: available, easy to handle, safe (detechable)

Disadvantages: expensive, need working coagulation

Effect: permanent

Varias: 0.018“/0.035-0.038“

Multiples types, fibered? (Polyester, Dacron)
Metallic Microcoils

**VortX-18 Diamond Shaped Fibered Platinum Coil**
- M0013822031
- M0013822041
- M0013822051
- M0013822061

**VortX-18 Fibered Platinum Coil**
- M0013812031
- M0013812041
- M0013812051
- M0013812061

**Multi-Loop-18 Fibered Platinum Coil**
- M0013120431

**Figure 8-18 Fibered Platinum Coil**
- M0013120211

**Complex Helical-18 Fibered Platinum Coil**
- M0013120221
- M0013120331
- M0013120441
- M0013120551
Microcoils: **Pushable Coils**
Microcoils: **Pushable Coils**

1. „Jet-technique“ with 1 ml syringes
2. Coil pusher

**Courtesy: Boston Scientific**
What are **Detechable Coils**?

Very important: release technique

Courtesy: Boston Scientific
Instant Detachment System

Detach coil using Instant Detacher

Concerto™ Detachable Coil; Quelle: Covidien/ev3
Instant Detachment System

Detach coil using Instant Detacher

Concerto™ Detachable Coil; Quelle: Covidien/ev3
Electrolytic Detachment

Source: Terumo
**Goal:** dense packing of the coils $\Rightarrow$ lower recanalisation rate (risk of rebleeding)

**Large vessel:** start with larger coils, „anchor-method“, detachable coils or device (Amplatzer Plug)

**Alternative:** „Scaffolding technique“
Basic Embolisation Technique

1. Frontdoor only

2. Frontdoor & Backdoor
Basic Embolisation Technique

1. Frontdoor only

2. Frontdoor & Backdoor
Case: only Detachables Coils
Case: only Pushables Coils
Case 5: early complication after NTPL: AV-fistula

In most cases after biopsies; incidence: 3-17%

Signs:
- turbulent flow in duplex with high speed velocities
- Large AV-fistula impress as echoinhomogenic RF in the B-view
Case 5: early complication after NTPL: AV-fistula
Case 5: early complication after NTPL: AV-fistula
Results of Renal Emergency Embolisation

• angiographical (technical) success  80 - 100%  \(^1,2\)
• Clinical success rate  70 - 100%  \(^1,2,3\)
  Loss of tissue  ca. 10%  \(^4\)
  Without impairment of GFR  \(^5\)
• Complications  0-19%  \(^1,6\)

\(^1\) Brewler ME J Urol 2009;181:1737-1741
\(^2\) Schmidlin F Urologe 2005;44:863-869
\(^3\) Menaker J World J Surg 2011;35:520-527
\(^4\) Santucci RA BJU 2004;93:937-954
\(^5\) Morita S Scand J Trauma 2010;18:1
\(^6\) Fu CY Am J Surg 2010 (Epub ahead of print)
Case: only Pushables Coils
Case: Haematoma of the abdominal wall

70 year male patient: patient after large abdominal-OP. / daily injection of unfractionated heparin (UFH) into the abdominal wall

Clinical background:
HB-drop, increase of abdominal girth

Question:
Bleeding? ➔ emergency CT
a-b. Active arterial bleeding in the m. rectus abdominis re.
c. 3D curved MPR shows the feeding artery coming from the AIE (weiße Pfeile)
d. haematoma in the m. rectus abdominis re. and pelvic region
Anatomy A. epigastrica

Black arrowhead:
to cranial and **lateral** rising: the A. circumflexa ilium profunda

White arrowhead:
to cranial and **medial** rising: the A. epigastrica inferior.
- puncture **contralateral** groin & sheath
- 4F Uniflush/Cobra-catheter and 0.035 Terumo for going crossover
- 4F-Berenstein-catheter and 2,4F microcatheter
- recanalisation of the right Arteria epigastrica inferior
DSA in 25° RAO for identification of the bleeding branch rising of the right arteria epigastrica inferior. Recanalisation and placement of the mikrocatheters distal of the bleeding.
Application of 7 x microcoils (1x 2/5 and 6 x 4/4) till total occlusion distal and proximal of the bleeding (backdoor/frontdoor occlusion)
-DSA using the 4F Berenstein-catheter: no bleeding anymore
Case: Combinations
Pseudoaneurysms of the Common Hepatic Artery Following Pancreaticoduodenectomy: Successful Emergency Embolization

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1 month postoperatively following pylorus-preserving pancreaticoduodenectomy due an abscess formation.

Case 1 & 2
Ergebnisse: präintervent. CT

Case 2
Ergebnisse: Intervent. Angio
Ergebnisse: Intervent. Angio
AZUR Framing coil is a platinum coil that offers a three-dimensional shape to cover the wall of an aneurysm or the inner lumen of an artery.

This coil is intended to give greater stability and safety\(^1\) in challenging situations such as wide neck aneurysms or high-flow territories.
AZUR Peripheral HydroCoil embolization system combines a platinum coil and an expandable hydrogel polymer. The hydrogel coating expands in the direction of less resistance to fill space when introduced into the bloodstream.
AZUR CX Peripheral Coil System introduces a new and unique concept: the first and only peripheral HydroCoil with cross-sectional coverage and the benefits of patented hydrogel technology, allowing easy control in high-flow areas.

By matching the Progreat double marker with AZUR detachable coils, the Terumo peripheral coiling solution offers interventional radiologists the precision of neuroradiology procedures in peripheral vessels.
Today: „Scaffolding with Framing COILS“
Onyx as a last help?
Case: only Amplatzer Device
Amplatzer Vascular Plug (AGA Medical/St. Jude):

- Diameter of Vascular Plug‘s: 3-22 mm
- Different Typen (II-IV)
- 6 & 8 mm Amplatzer Device Plug II over 4F
- 10 & 12 mm Amplatzer Device Plug II over 6F
Day saved by the mighty Interventional Radiology
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