Minimizing dose in complex EVAR procedures

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Friday, January 29, 2021
Disclosure

Speaker name:

Blandine MAUREL

I have the following potential conflicts of interest to report:

- Consulting: COOK, Philips
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest
RADIATION EXPOSURE

• Patient

• Operator: exposed to daily very low doses over its entire career
  ✓ lenses injuries
  ✓ malignant tumours
How minimizing dose in complex EVAR?

Cumulative radiation dose depend on:
- Operator’s expertise and awareness
- Imaging system
- Dose settings

Georges et al, Arch of CV Disease 2009
IMAGING ENVIRONMENT AND SETTINGS
IMAGING ENVIRONMENT

- Flat panel detector
IMAGING ENVIRONMENT

- Flat panel detector
- High-definition large monitor
IMAGING ENVIRONMENT

- Flat panel detector
- High-definition large monitor
- Remote contrast injector
• Flat panel detector
• High-definition large monitor
• Remote contrast injectors
• Full operator control at table side
• Dose-reducing softwares
• Configuration, optimisation and calibration of the settings with engineer / medical physicist
• Various low dose protocols
PRE-OPERATIVE PLANNING
Pre operative planning of target vessels angulations

- RAO 50
- LAO 35
DURING THE PROCEDURE:
ALARA principles
OPERATOR’S EXPERTISE: ALARA

Reduction of the dose

- Limit steep angulation and go back to AP
OPERATOR’S EXPERTISE: ALARA

Reduction of the dose

• Maximum collimation combined with digital zoom
OPERATOR’S EXPERTISE: ALARA

Reduction of the dose

• Replace DSA by fluoro loops
OPERATOR’S EXPERTISE : ALARA

Reduction of the number of images

• Limit the pedal time
• Use low dose settings by default
• Adjust table and C-arm positioning on the area of interest without X-rays, using fusion imaging
ADVANCED IMAGING SYSTEMS AND ALTERNATIVE TO X-RAYS
FUSION IMAGING

- Reduces contrast volume, fluoroscopy time, and procedure time in complex EVAR
- Must be adjustable: translation or deformation
ALTERNATIVE IMAGING MODALITIES

- Contrast enhanced ultrasound
- Contrast enhanced trans-esophageal echocardiography
- IVUS
- FORS
OUR EXPERIENCE
Our experience before / after optimisation of the hybrid suite during FBEVAR

### DAP

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<th>Hybrid suite before optimisation (N=12)</th>
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### CAK

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TAKE HOME MESSAGE

• Settings optimisation to work by default with the lowest dose for an acceptable image quality

• Imaging environment : hybrid suite with large monitor

• Application of the ALARA principles

• Alternative to X-rays
"Dans la vie rien n'est à craindre... tout est à comprendre"

Marie Curie

THANK YOU