ITIX: Mid-Term effects of an intensive radiation-protection-training on the Intraoperative X-ray-radiation exposure in a hybrid OR

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Disclosure

Speaker name:
Heiko Wendorff

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)

I do not have any potential conflict of interest
Background and Rationale of the study

- New challenges in the Hybrid OR
- Yearly training in radiation protection is necessary

Central research question

Can we hold the X-ray radiation exposure-reduction in PTA’s in a Hybrid-OR by an intensive training after 10mo?
Materials and methods

- Prospective, non randomised, monocentric, clinical study
- Study period: Nov 2016 – Jan 2018 (incl. follow-up)
- Effective number of patients: 150 (50 before, 50 after training, 50 10mo)
- Statistics: Welch-two sample t-test, MonteCarlo permutation test, Grubbs Outlier test

Criteria for inclusion:
- PAD IIa, IIb, III and IV (Fontaine) (equal Rutherford 1-6)

Criteria for exclusion:
- Pregnancy, Breast feeding
- Impossibility of endovascular treatment
- Emergency interventions
# Intensive additional radiation protection training

<table>
<thead>
<tr>
<th>Com. radiation protection/ALARA</th>
<th>Additional training</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>legal requirements</strong></td>
<td></td>
</tr>
<tr>
<td>▪ Basic course rad. protection (24h)</td>
<td>▪ 3 days inspection HOT</td>
</tr>
<tr>
<td>▪ Special course rad. protection(20h)</td>
<td>▪ Analysis and intensive training of the leading surgery-team by an experienced radiologist</td>
</tr>
<tr>
<td>▪ Special course interventional radiology (8h)</td>
<td>▪ Interactive training in the OR</td>
</tr>
<tr>
<td>▪ Yearly Briefing (4h)</td>
<td>▪ Lectures for the complete OR-team</td>
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</table>
Key points

Our key points

- Improve collimation
- Avoid magnification
- Using the best adjustments
- Reduce the fluoroscopy time
Endpoints

• **Primary endpoint:**

  • Reduction of the dose area product in PTA’s (mGycm²)

• **Secondary endpoints:**

  • Reduction of the fluoroscopy time in PTA’s (min)

  • Reduction of the contrast media in PTA’s (ml)
# Patient characteristics

<table>
<thead>
<tr>
<th></th>
<th>Before training (cohort A)</th>
<th>After training (cohort B)</th>
<th>10 mo post tr. (cohort C)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N=</strong></td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>70,1</td>
<td>72,0</td>
<td>72,7</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>25,6</td>
<td>26,1</td>
<td>25,9</td>
</tr>
<tr>
<td><strong>male</strong></td>
<td>68%</td>
<td>70%</td>
<td>70%</td>
</tr>
<tr>
<td><strong>Procedure time (min)</strong></td>
<td>86,3</td>
<td>83,2</td>
<td>83,1</td>
</tr>
<tr>
<td><strong>Aortic/iliac</strong></td>
<td>10</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td><strong>Femoral</strong></td>
<td>33</td>
<td>33</td>
<td>31</td>
</tr>
<tr>
<td><strong>Lower leg</strong></td>
<td>7</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th></th>
<th>Before (cohort A)</th>
<th>After (cohort B)</th>
<th>10 mo after (cohort C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>DAP (mGycm²)</td>
<td>35557</td>
<td>16086</td>
<td>13762</td>
</tr>
<tr>
<td>fluoroscopy Time (min)</td>
<td>12,0</td>
<td>9,1</td>
<td>10,3</td>
</tr>
<tr>
<td>contrast media (ml)</td>
<td>76</td>
<td>68</td>
<td>66</td>
</tr>
</tbody>
</table>
Results DAP (mGycm2)

(cohort A->B) 55%, p<0,05,  (cohort A->C) 62%, p<0,05
no significant reduction of the fluoroscopy-time
no significant reduction of the contrast-media use
Conclusions

• An intensive additional radiation protection training for the OR-team reduces the DAP in PTA’s significantly (>50%), also middle-term (collimation, avoid magnification, reduce radiation time)

• This training can change the team-philosophy of radiation protection

• No significant reduction of the fluoroscopy time

• No significant reduction of the amount of contrast media
Save the date – MAC 4.-6.12.2019

Thank you!