EVAR for AAA without conventional angiography in patients with normal or impaired renal function using VesselNavigator

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Disclosure

Speaker name:  **Jae Kyu, KIM MD**

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
Introduction

Trends in complex endovascular procedures

- Double digit growth endovascular AAA procedures, CAGR of 10% for (T)EVAR
- Very high contrast medium levels for (T)EVAR procedures
- Long procedure times due to increased level of complexity

*Millennium Research Group Annual Report 2013
Deterioration in renal function has been described after endovascular repair of abdominal aortic aneurysms (EVRs). The etiology is multifactorial and represents an important therapeutic target. A need exists to quantitatively summarize incidence and severity of renal dysfunction after EVR to allow better-informed attempts to preserve renal function and improve life expectancy. Here a systematic search was performed using Medline and Embase for renal function after EVR applying PRISMA statements. Univariate and multivariate random-effects meta-analyses were performed to estimate pooled postoperative changes in serum creatinine and creatinine clearance at four time points after EVR. Clinically relevant deterioration in renal function was also estimated at 1 year or more after EVR. Pooled probability of clinically relevant deterioration in renal function at 1 year or more was 18% (95% confidence interval of 14–23%, I² of 82.5%). Serum creatinine increased after EVR by 0.05 mg/dl at 30 days/1 month, 0.09 mg/dl at 1 month to 1 year, and 0.11 mg/dl at 1 year or more (all significant). Creatinine clearance decreased after EVR by 5.65 ml/min at 1 month–1 year and by 6.58 ml/min at 1 year or more (both significant). Thus, renal dysfunction after EVR is common and merits attention.

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Introduction

1. Increase in the amount of **RADIATION** to operator / patient --- radiation hazard

   **ALARA !**

2. Increase in the amount of **CONTRAST MEDIA** --- nephrotoxicity on patient

   **Reduction / no !**
To present the early experiences of EVAR without conventional angiography for the normal or impaired renal function patients using VesselNavigator to reduce the radiation dose and contrast-materials during procedure.
Materials and Methods

- 10 pts with AAA; normal (2)
  ; impaired renal function (8)
- VesselNavigator (Philips)
- Analysis the total procedure time, total fluoroscopic time, total AK, total DAP
- Supplementary angiography if needed
- FU CTA or CE-US
VesselNavigator workflow steps
Intuitive and easy to use by providing step by step workflow guidance

Segmentation
- Select vasculature of interest

Planning
- Add ring markers
- Plan optimal angle

Registration
- 2D-3D: bony landmarks
- 3D-3D: calcifications

Live Image Guidance
- Select preferred visualization
- Follow C-arm and table movements
Case 1: Infrarenal fusiform AAA with hypersensitivity to CM

70 year old Male
Case 1: Localization of renal artery orifice
Case 1: Main Body deployment
: Cannulation of contralateral limb
Case 1: Balloon dilation of SG

Total Air Kerma: 347mGy
Total Fluoro time: 22min
No contrast angiography

Total DAP: 73799mGy / cm²
Total Procedure time: 65min
Case 2: Short neck r-AAA

81 year old Male
Total Air Kerma : 685 mGy
Total Fluoro time : 10min
No contrast angiography

Total DAP : 248016 mGy / cm²,
Total Procedure time : 66min
Results

10/10 EVAR; successfully done

<table>
<thead>
<tr>
<th>Total fluoroscopic time (min)</th>
<th>Total AK (mGy)</th>
<th>Total DAP (mGy/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.56~22.46</td>
<td>73.26~347.77</td>
<td>15,647~73,799</td>
</tr>
</tbody>
</table>

Total Procedure time (min)
55 ~ 69
Results

- Complementary CO2 angiogram 2 cases
- No endoleak or misplacement of SG in FU CTA or CE-US
Conclusions

1. The procedure is depended on the complexity of AAA anatomy, the experience of operator

2. *VesselNavigator (Philips)* can be useful tool for EVAR in normal or impaired renal function patients without iodinated-contrast conventional angiography to reduce the amount of radiation dose and CM
Thanks for your attentions!!
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