CO$_2$ angiography for EVAR treatment
Tips and tricks

2020

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Disclosure

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I have NO potential conflicts of interest to report:

Consulting
Employment in industry
Shareholder in a healthcare company
Owner of a healthcare company
Other(s)

I do not have any potential conflict of interest
ADVANTAGES OF CO₂

Compared with iodinated contrast media:

- CO₂ has No Nephrotoxicity
- No Allergic reactions
- Does not give hepatotoxicity

→ Safety gas for the body
UNDERSTANDING CO$_2$ IMAGING

Carbon dioxide (white) will generate a representative image depending on the amount of blood that is displaced.

CO$_2$ FLOATS

CO$_2$ FILLS SUPERFICIAL VESSELS

IF RENAL ARTERY IS IN A POSTERIOR POSITION FROM SAGITTAL PLANE POINT OF VIEW IT WILL BE DIFFICULT TO COMPLETELY FILL IT WITH CO$_2$
TABLE TILT

HEAD-UP TILTING OF PATIENT

LATERAL TILTING OF PATIENT

tilt-up of appropriate side to highlight an individual renal artery
PREPARATION OF THE SHEATH
PREPARATION OF THE MACHINE

Injection parameters for the Aorta

- Volume: 10 ml, 100 ml
- Pressure: 300 mmHg, 40 kPa
PREPARATION OF IMAGE INTENSIFIER

- A mobile or fixed C-arm can be used
- high frame rate (typically >10fps)
- colour inversion
- multiple runs can be obtained at minimum of one minute intervals
EVAR CLINICAL CASE: IDENTIFICATION OF RENAL ARTERIES POSITION
CONFIRMATION WITH ENDOGRAFT IN PLACE
CONFIRMATION AFTER PROXIMAL DEPLOYMENT OF ENDOGRAFT
IDENTIFICATION OF LEFT HYPOGASTRIC ARTERY
CONTROL OF THE PATENCY OF LEFT HYPOGASTRIC ARTERY
IDENTIFICATION OF RIGHT HYPOGASTRIC ARTERY
### Recapitulatif Procédure

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injections effectuées</td>
<td>4</td>
</tr>
<tr>
<td>Volume d'injection total</td>
<td>120 ml</td>
</tr>
<tr>
<td>Volume de purge total injecté</td>
<td>0 ml</td>
</tr>
<tr>
<td>Total CO2 injectée</td>
<td>120 ml</td>
</tr>
<tr>
<td>Moyenne volume d'injection</td>
<td>30,0 ml</td>
</tr>
<tr>
<td>Moyenne pression d'injection</td>
<td>250,0 mmHg</td>
</tr>
</tbody>
</table>
F-EVAR: CLINICAL CASE

CO₂

Contrast
TAKE HOME MESSAGE

- Modern CO\(_2\) delivery approaches: modern automatic angiography systems
- No renal insult
  - applicable for renal transplants, CKD
- No contrast allergy
- Allows EVAR and even F-EVAR with no iodinated contrast media at all or minimal injections
- Safe
- Excellent hypogastric artery visualization
- Excellent type II endoleak detection
- Renal arteries visualization to be improved but possible with table tilt
THANK YOU FOR YOUR ATTENTION
CO\textsubscript{2} angiography for EVAR treatment

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