Fusion Image Laser Fenestration In Situ (FIL&FIS) for endovascular repair of type 1A endoleak.

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Type 1A endoleak (T1AE) is caused by a failed sealing of a proximal stent-graft’s attachment to the vessel wall.

In the case of T1AE, immediate correction must be performed because this endoleak leads to constant increase of sac pressure, without the possibility of spontaneous resolution.
History:

- In 2007 Professor Panneton from the USA first applied laser fenestration for LSA.

- This technique at the renovisceral arteries level began more than 4 years ago in Marie Lannelongue Hospital in France.

- In the Department of Professor Desgranges we first performed a laser procedure in September 2016. Now we have 24 cases utilizing this technique. We used Images Fusion for this procedure.
• This presentation will describe the experience of six patients with Type 1A endoleak (T1AE), treated with the use of FIL&FIS technique.
Henri Mondor experience with T1AE underwent EVAR with FIL&FIS:

• Between April 2017 and Septembre 2018.
• 6 patients: 2 men, 4 women, mean age 76.8 years (4*)

• Technical success was achieved in all cases.
Case 1

- 82-year-old patient with strong abdominal pain with AAA at 80 mm in diameter.

- EVAR 3 years earlier for AAA at 59 mm in diameter.

- **Reasons of T1AE:** Upper neck was very short with a length of only 4 mm and with a thrombus.
Procedure:

- As a proximal extension we used Endurant cuff; 36 – 70.
- After laser fenestration to SMA and both RA.
Case 2

- Patient aged 79 with an AAA at 71 mm in diameter.

- 7 years after EVAR for AAA at 50 mm in diameter.

- **Reasons of T1AE:**
  Upper neck was short with a length of 9 mm and conical 21 - 27 mm in diameter respectively.
Procedure:

- As a proximal extension we used Endurant cuff 32-70-32.
- After laser fenestration to SMA and both RA.
Case 3

- Patient aged 60 with AAA at 57 mm in diameter 18 months after EVAR for AAA.

- **Reasons of T1AE**: Minimal proximal diameter of the implanted stent-graft, comparing to the diameter of the aneurysm’s upper neck, which was 30 mm.
Procedure:

- As a proximal extension we used Endurant cuff 32-70-32.

- After laser fenestration to SMA and both RA.
Case 4

- Patient aged 84 with an enlargement AAA at 67mm in diameter.

- 5 years after EVAR for AAA.

- Reasons of T1AE:
  Upper neck length of 15 mm with thrombus, wide and conical 31.5 to 36.5 mm in diameter respectively.
Procedure:

- As a proximal extension we used Endurant cuff 32-70-32.

- After laser Fenestration to SMA, and LRA. Chimney for RRA.
Case 5

85-year-old female patient with AAA.

Reasons of T1AE:
Upper neck was very short of 8 mm.

Intraoperational migration.
Procedure:

- As a proximal extension we used Endurant cuff 32-70-32 juxta the SMA.

- After Laser fenestration to RRA and chimney for LRA.
Case 6

- 68-year-old female patient. Increase proximal thoracic aneurysm to 60 mm in diameter with T1AE.

- Co-morbidity: In April 2015 Thoracic stent-graft for thoracic aneurysm.

- In June 2015 Branched stent graft COOK.

- Reasons of T1AE: Upper neck was very short and irregular.
2 Stent grafts Valiant were deployed just below Brachiocephalic Trunk (common trunk).

During the first phase of the FIL & FIS procedure, catheterization through the Left brachial artery.

After laser fenestration of the stent-graft with V12 stent to the LSA.
In conclusion

• FIL&FIS seems to be effective, and is inexpensive.

• Rapid option with no need for customized endografts, that safely allows to re-vascularize visceral and renal arteries during treatment of T1AE following EVAR.

• Sizing is easier.
Thank you very much for your attention

Dziękuję bardzo za uwagę

Merci beaucoup pour votre attention
Advantages of FIL&FIS

- Immediately available
- Sizing more easily
- Easily facilitated
- Less expensive
Henri Mondor experience with T1AE underwent EVAR with FIL&FIS:

• Between April 2017 and Septembre 2018.
• 6 patients: 2 men, 4 women, mean age 76,8 years (4*)

• 3 patients with fenestration to SMA and both RA.
• 1 patient with fenestration to SMA, LRA and chimney for RRA.
• 1 patient with fenestration to RRA and chimney for LRA.
• 1 patient with fenestration to LSA.

• Technical success was achieved in all cases.
Endoleaks are one of the most important reasons of vascular reinterventions after EVAR.

Type IA and IB - Attachment Leak

Type II - Branch Flow

Type III - Modular disconnection

Type IV - Fabric porosity
T1AE

Occurs in approximately 10% of patients operated by EVAR.
• **The risk of T1AE**

• increases in cases of aneurysms with a difficult anatomy, especially unfavorable proximal neck:
  1) Short neck (<15mm),
  2) Large diameter of the proximal neck (> 28mm),
  3) Irregular shape i.e. conical,
  4) Presence of a thrombus,
  5) Strongly calcified neck,
  6) With proximal angulation more than 60°.

• T1AE can be the consequence of
  1) Stent-graft fatigue,
  2) Or disease’s progress,
• **The risk of T1AE**

• **Mistakes of sizing**
  - Length and diameter measurements,
  - ?
    - over-sizing,
    - oversizing more than 30%
    - under-sizing.

• **Mistake to put in stent-graft**
Treatment of the endoleak type 1A

- We can distinguish methods of treatment, such as total or partial conversion to open surgery with banding, and use of prosthesis or allografts.
(2) Treatment of the endoleak type 1A

- The majority of the T1AE detected intraoperational can be treated by
  - With balloon modulation
  - With proximal extender cuffs and modular devices such as Palmaz stent, Sinus-XL Stent.

- When the upper edge of endoprosthesis is close to renal arteries:
  - Use of EndoAnchors (Aptus Endosystems)
  - Embolotherapy using coils, other materials like Onyx or even fibrin glue.
(3) Treatment of the endoleak type 1A

- **Fenestrated and branched stengrafts** including custom-made or home-made,

- **Parallel techniques** such as chimney (ChEVAR), periscope and sandwich.

- **(PMSG)** Physician-modified stent-graft in situ fenestration techniques (mechanical or physical such as radiofrequency or laser).

- Or the use of **Off-the-Shelf t-Branch Device** or **Colt Device**.

- In 2004 Mc Williams et al. performed the first use of retrograde fenestration in situ to LSA with the stiff guidewire.

- **Fenestration of endograft with laser** to LSA was reported in 2007.
Mme TORPPA Gloria

85 ans

DATE 03/10/18

douleurs

les arom.

les chim.

les ARG

R: 13/10 95 mm Hg
R: 12/10 95 mm Hg
R: 14/10 95 mm Hg

AP: 22 et 28

Stents:

R: 40 & 120
R: 26 & 120
Bentley 6 22 & 120
Bentley 5 22 & 120
Bentley 5 40 & 120
Bentley 5 60 & 120

Extension Endo.

32-30-32
le jambage Endo.

20-82-16
le jambage Endo gauche:

19-82-16

Tour: 10 & 10
Postoperative CT-scan showed complete exclusion of the aneurysm and patency of the stenting arteries.
Mme GROS Monique 68 ans

Patient:
1) 36-157-32
   avec foetale
   sur la SC6
2) 32-157-32

Stents:
  Beatley: 12-29-120
  12-39-120
  12-59-120

ARTIS (Tougaard)
Stages of the procedure

Fusion Images, Laser & Fenestration In Situ

CVX-300®
Excimer Laser System
1st stage: Images fusion.
2\textsuperscript{nd} stage. Endurant stent-graft on the level of target arteries.
3rd stage: Positioning APTUS Lanceur.
4th stage:
Stent-graft perforation with Laser Atherectomy Catheter, Spectranetics 0.9mm.
5th stage: Pre-dilatation with cutting balloon 2.5mm (guide 0.14)
6th stage: Second pre-dilatation with balloon 4–20.
7th stage: Stenting with V12 stent. Flaring with balloon 10-20.
In conclusion

• FIL&FIS seems to be effective, reproducible, and is inexpensive.

• Rapid option with no need for customized endografts, that safely allows to re-vascularize visceral and renal arteries during treatment of T1AE following EVAR.

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