Improvement of diagnosis and follow-up of patients with aortic disease with Artificial Intelligence

Clinical experience

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Disclosure

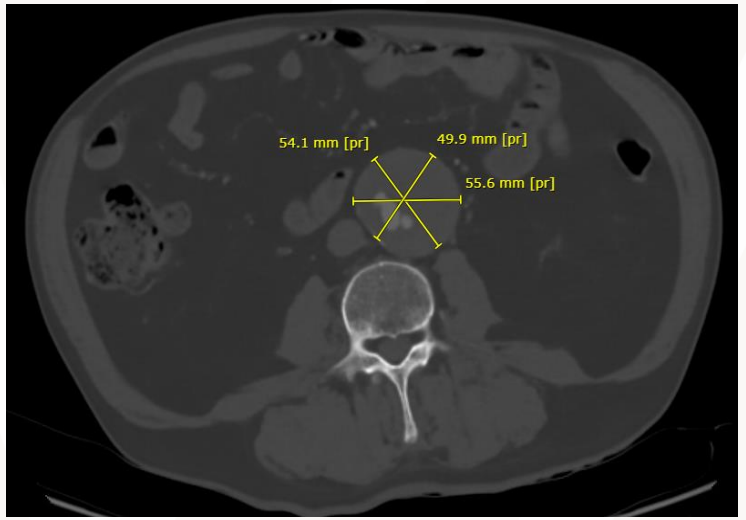
- None

Introduction

- ARVA is an AI tool for automatic measurements of the aorta.
- It enables standardization and time savings.
- Thanks to the radiology department, it is available in CHU of Liège since April 2024.
- ARVA needs computed tomography (CT) with contrast medium.
- Measurements provided are diameters and volumes at predefined levels.

Standardization

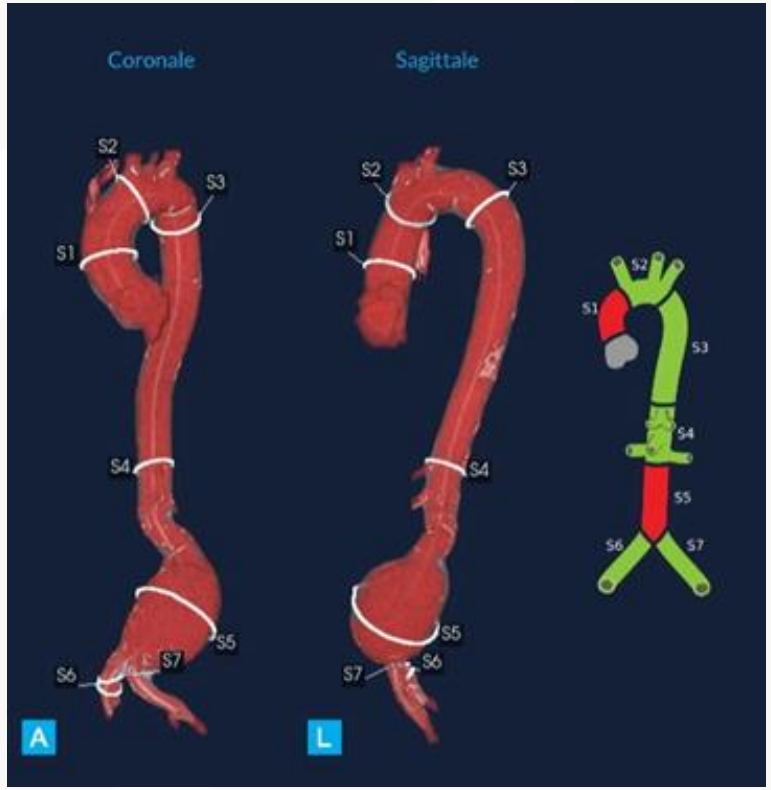
- Different physicians measure very often differents diameters of the aorta
- Radiologists may measure the abdominal aorta diameter at ≤ 55 mm, while surgeons may measure the same diameter at ≥ 55 mm



- This systematization is even more important for the follow-up of patients with small aneurysm or after EVAR

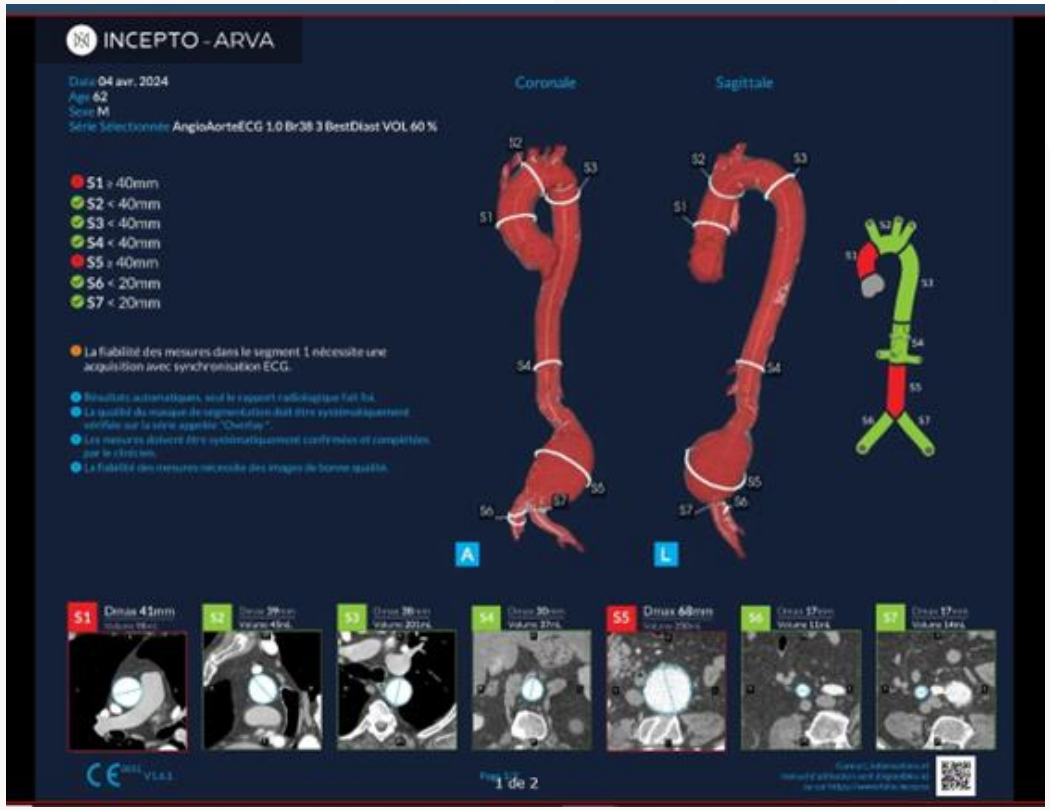
Time and diagnosis savings

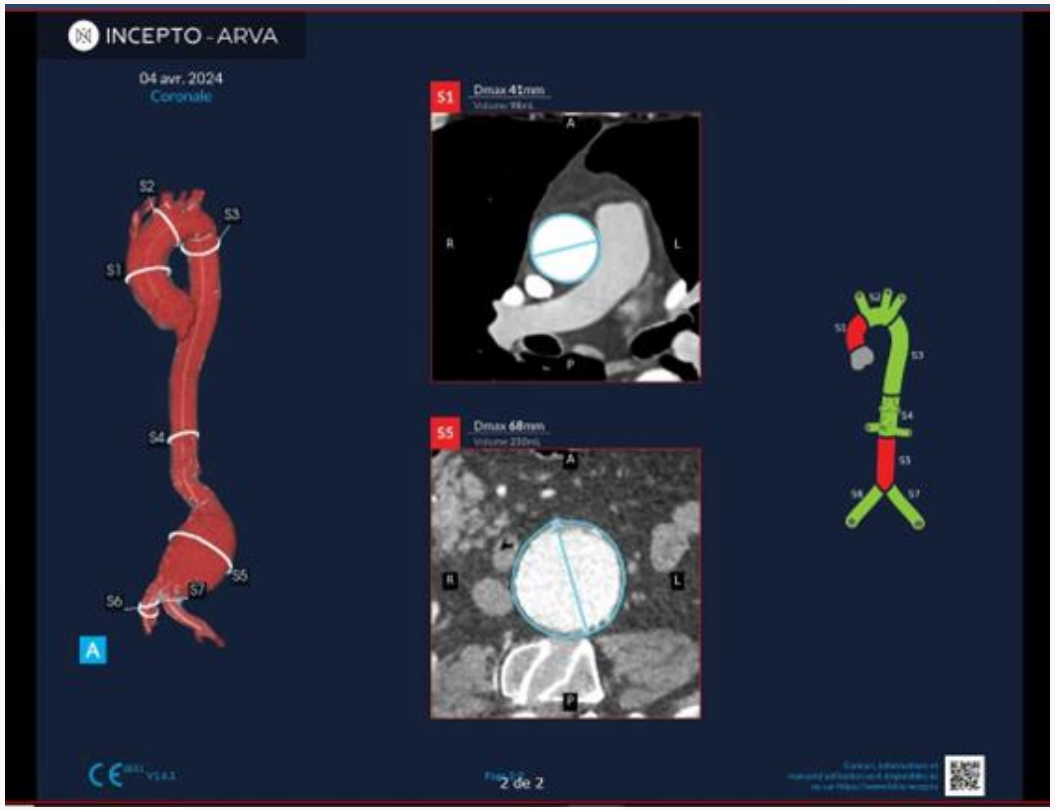
- Measurements are automatically and immediately brought with the CT images.
- At all the predefined levels.
- Too large diameters are emphasized in red color and normal diameters in green.
- This systematization of measurements avoid missing aneurysm diagnosis, especially in non-vascular contexts.



Real Life

Real life


INCEPTO - ARVA
Date 04 avr. 2024
Age 62
Sexe M
Série Sélectionnée AngioAorteECG 1.0 Br38 3 BestDiast VOL 60 %
Coronale
Sagittale
S1 ≥ 40mm
S2 < 40mm
S3 < 40mm
S4 < 40mm
S5 ≥ 40mm
S6 < 20mm
S7 < 20mm
La fiabilité des mesures dans le segment 1 nécessite une acquisition avec synchronisation ECG.
S1 Dmax 41mm
S5 Dmax 68mm
A
L
1 de 2


INCEPTO - ARVA
04 avr. 2024
Coronale
S1 Dmax 41mm
S5 Dmax 68mm
A
2 de 2

Case example 1

- 62-year-old ♀
- Transfered from another hospital where CT angiogaphy was performed, for type B acute aortic dissection
- Right kidney hypoperfusion and oliguria

  → right renal artery stenting at D1
- Thoraco-abdominal CT angiography with ARVA at D5

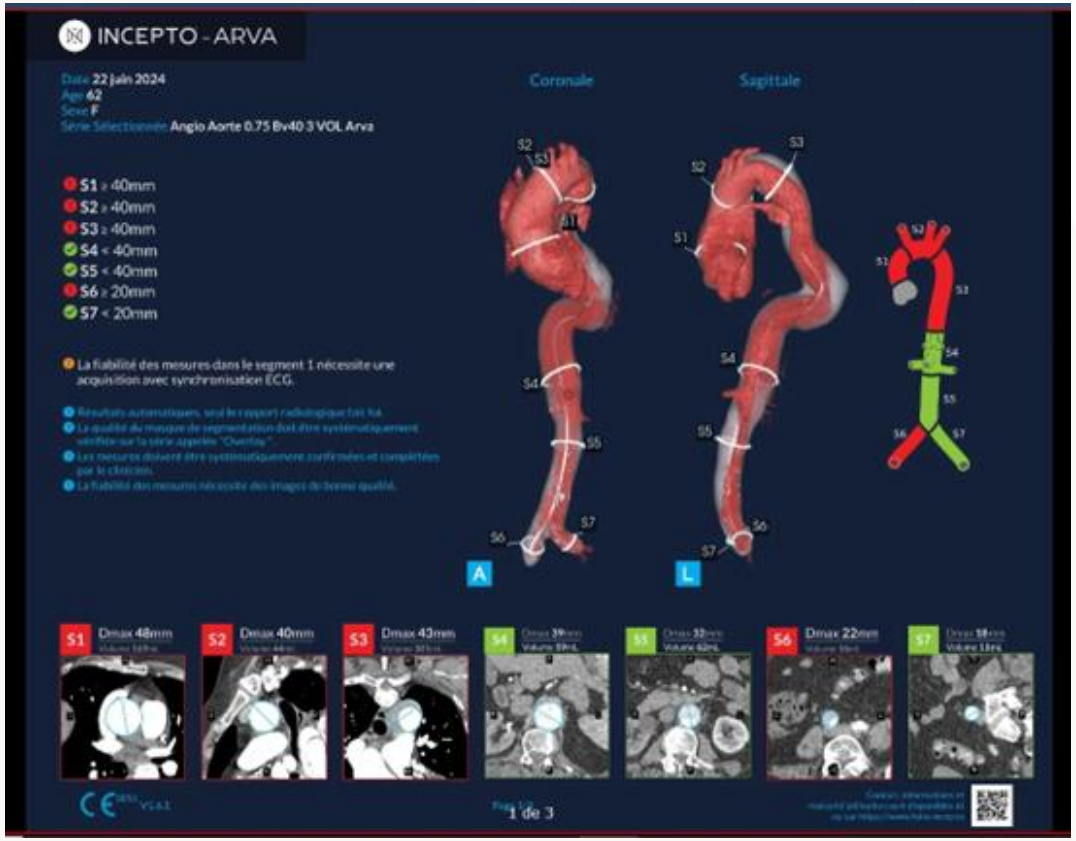
  → ascending aorta aneurysm about we were not really aware

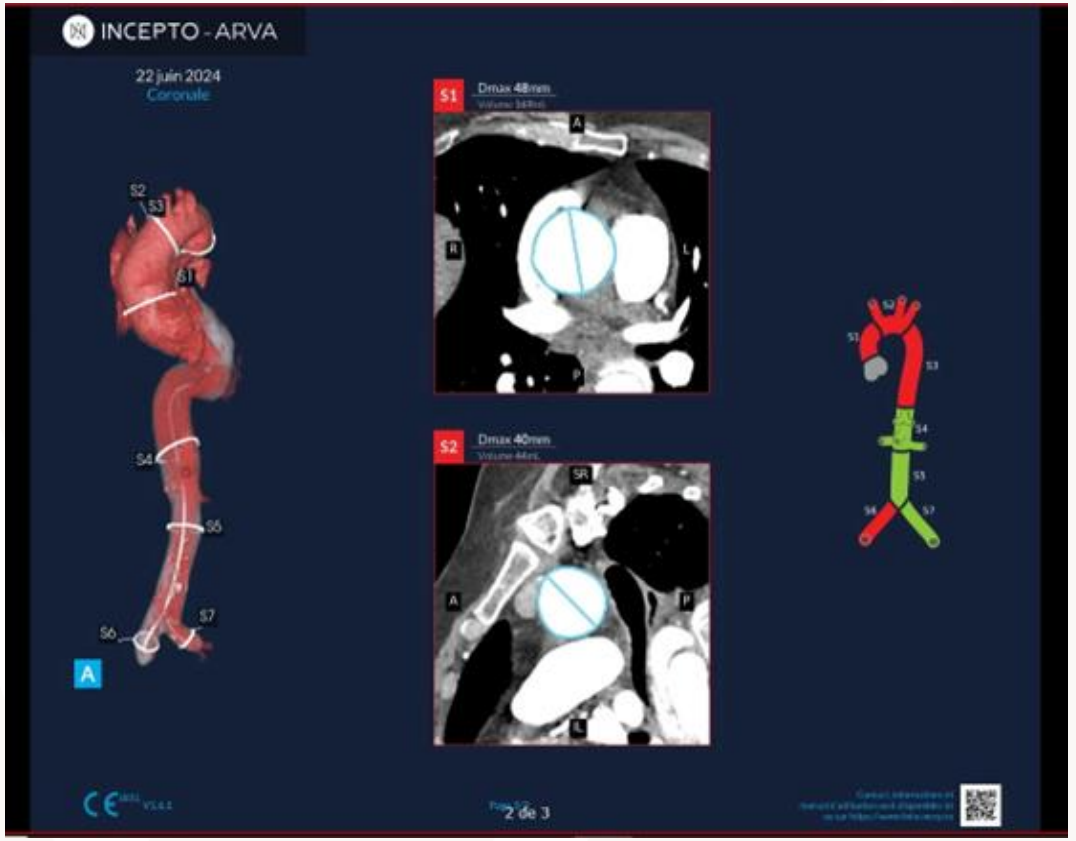
  → cardiologist and cardiac surgery evaluation

  → moderate aortic valve insufficiency, to follow

Case example 1

Case example 1



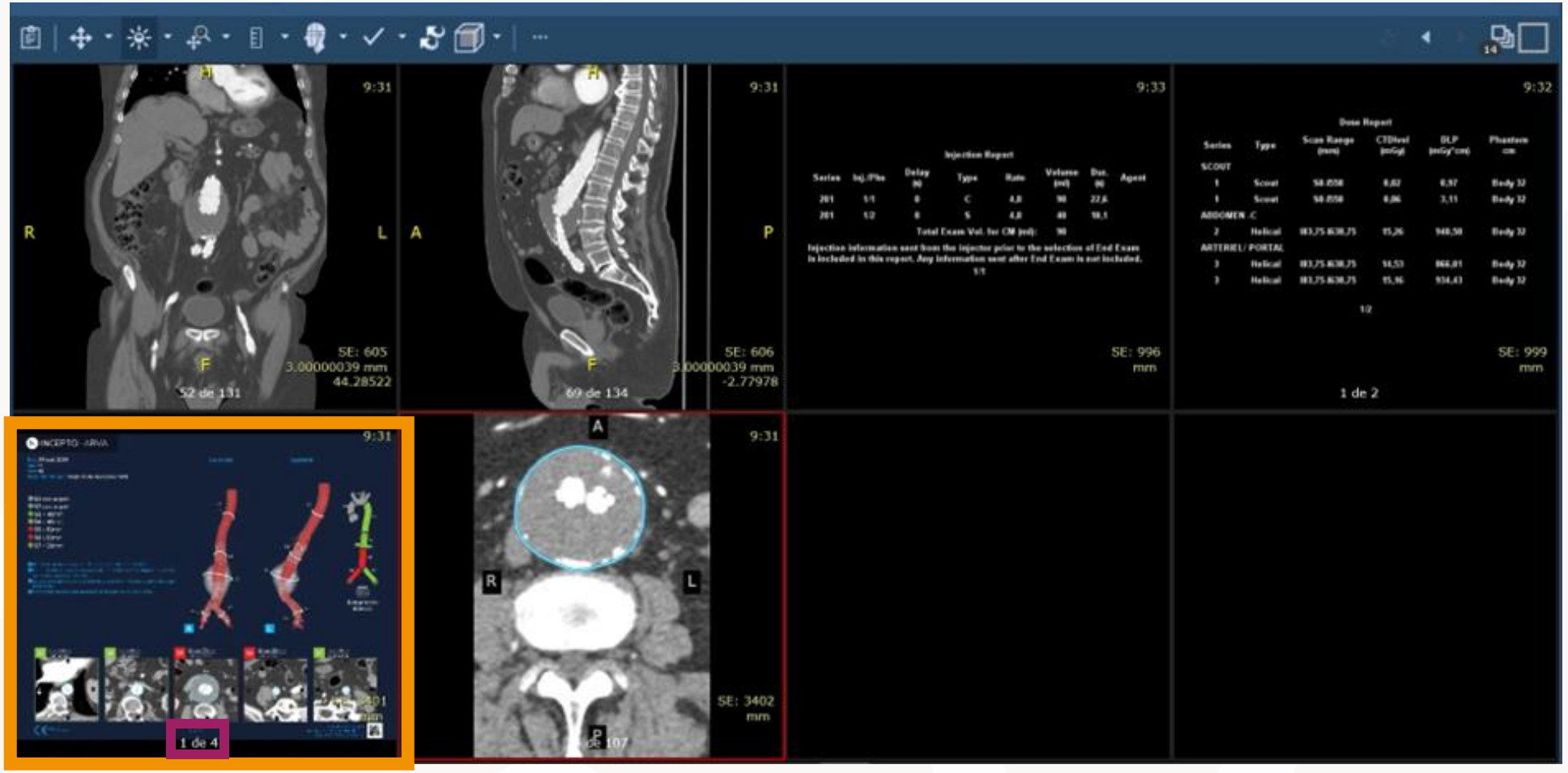


Case example 2

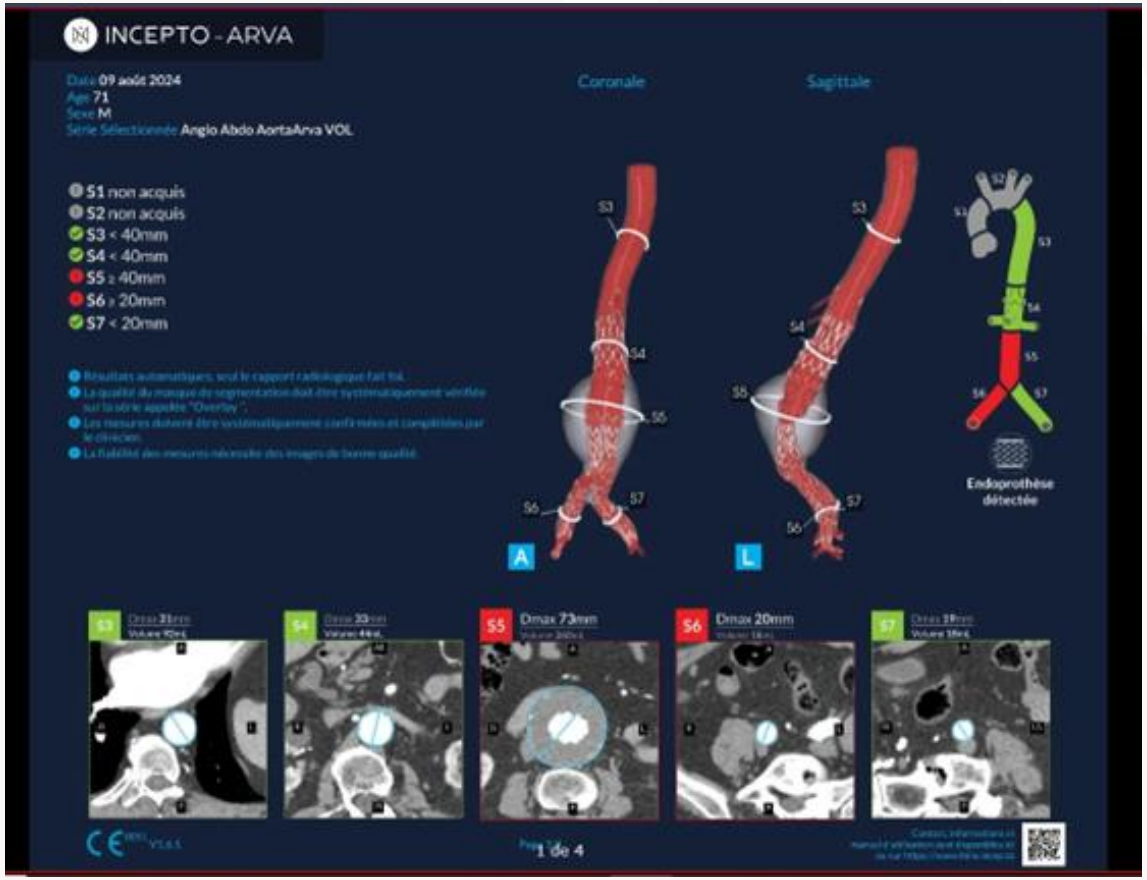
- 71-year old ♂
- EVAR in 2017
- Type 2 endoleak
- Follow-up discontinuation during Covid pandemic
- Comeback in 2023 : persistent type 2 endoleak
- CT angiography with ARVA in 2024

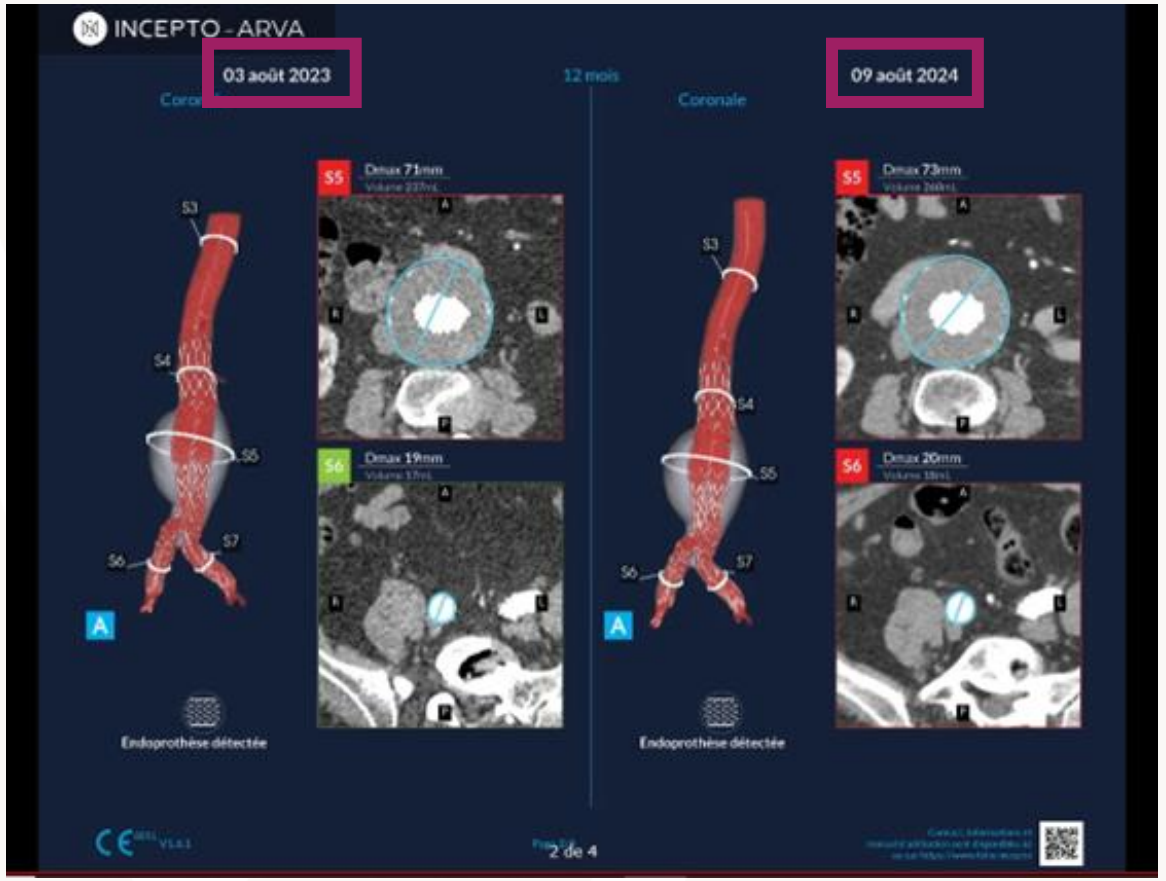
→ diameter follow-up

Case example 2



Case example 2





comparison of diameter on the right figure

Case example 2

diameter

volume

Conclusions

- Advantages are multiple :
  - to *avoid missing diagnosis*
  - to get quick measures → *time saving*
  - with systematization between physicians for the follow-up → *accuracy*
  - through automation and availability with the CT images, it is very *easy to use*

- It is only the beginning of AI and ARVA .....