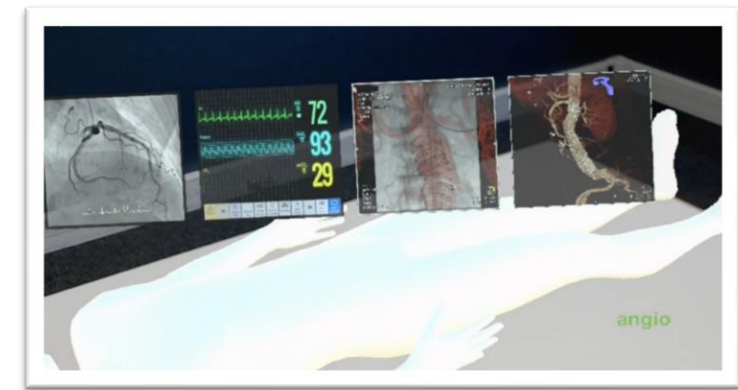


Interventional Holography

New Ergonomy for Hybrid Angio Suite



Claude Mialhe M.D.



CONFLICT OF INTEREST:

CoFounder and Shareholder of HoloWind (*Holo Works In New Displays*)

With the Friendly Collaboration of:

- *Nicolas LOUIS
- *Antoine MILLION
- *Nicolas VALERIO
- *Marc Antoine VASSEUR
- *Fabien LAREYRE

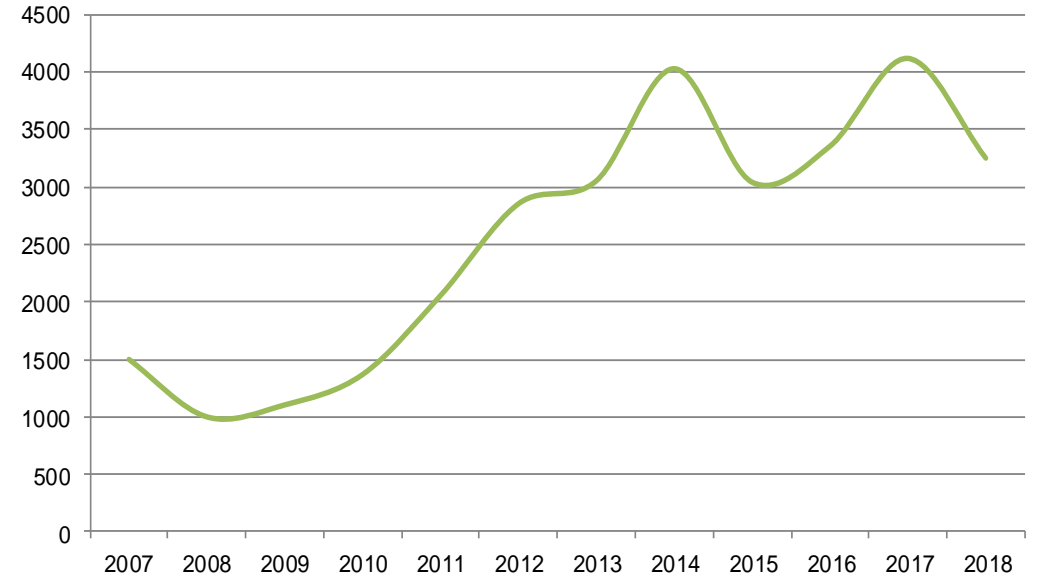
ENDOVASCULAR SURGERY: NEEDS FOR VISION



RADIATION EXPOSURE



Eff Dose for one year – Vascular Surgeon - μSv



VASCULAR PROCEDURES

Mid PDS

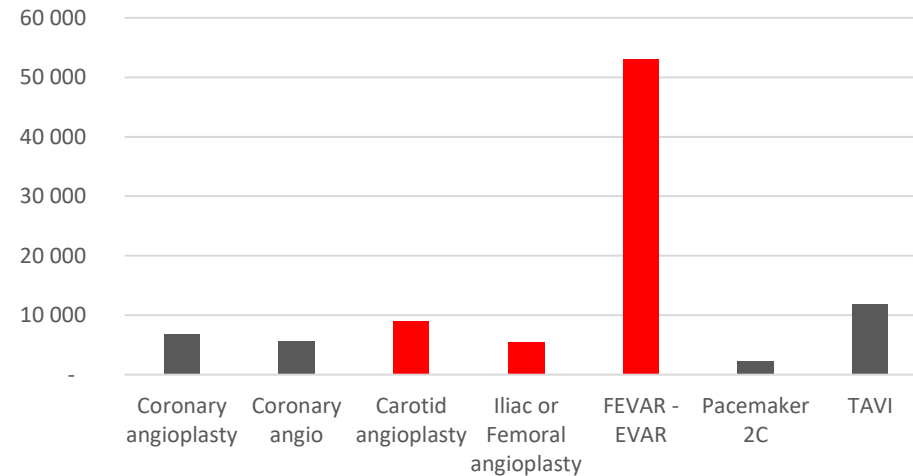
15 823 $\mu\text{Gy.m}^2$

CARDIAC PROCEDURES

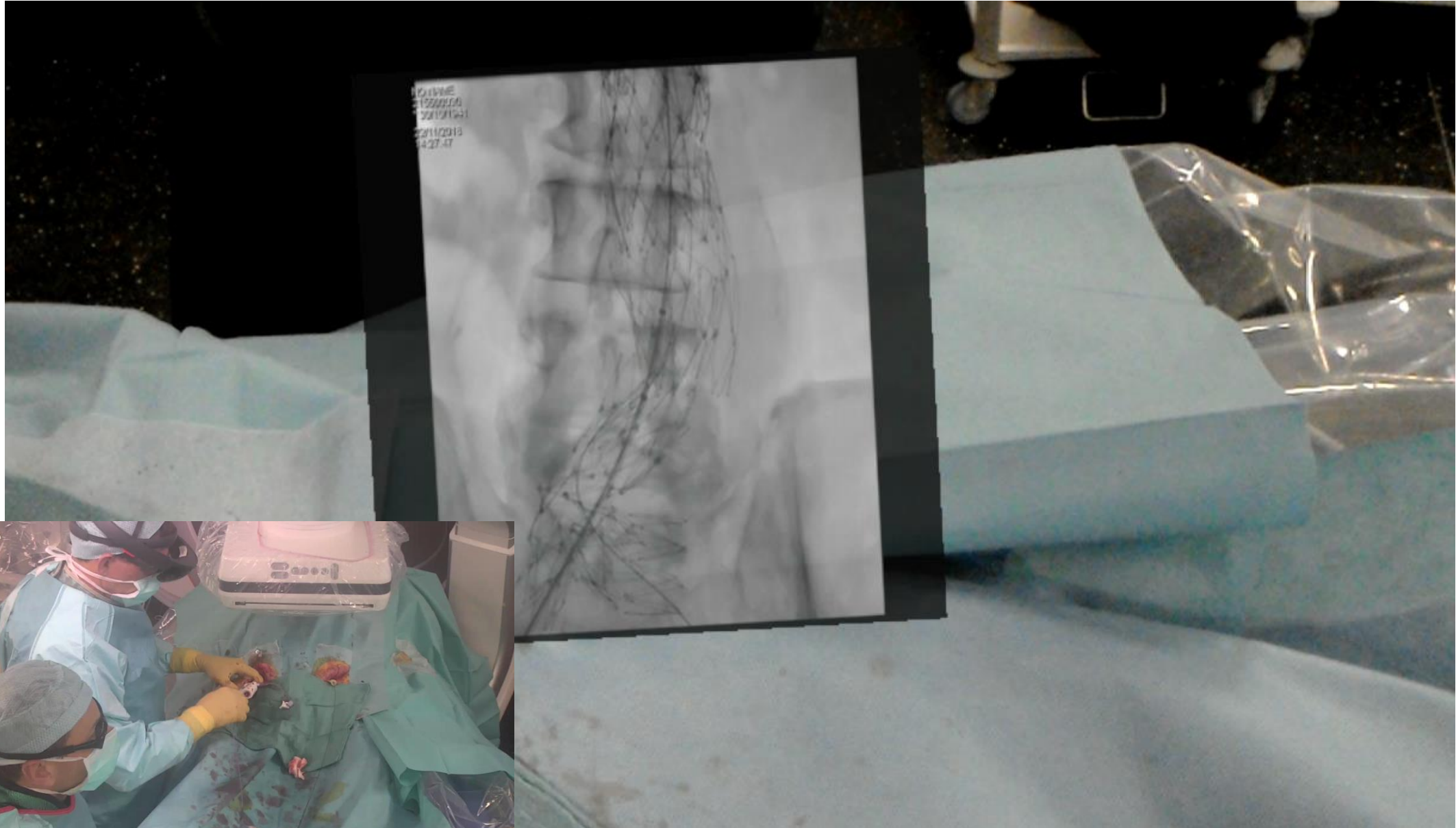
Mid PDS

6040 $\mu\text{Gy.m}^2$

Mid DSP ($\mu\text{Gy. m}^2$)



INTEGRATED HOLOGRAPHIC VISION



SCREEN HOLOGRAPHIC REPRODUCTION



SCREENLESS PROCEDURE

June 26th, 2018



Holographic Imaging with the HoloLens Head Mounted System to Enhance Angio Suite Ergonomics During an Endovascular Procedure.
Mialhe C, Raffort J, Lareyre F. *Eur J Vasc Endovasc Surg.* 2021 May;61(5):849-850. doi: 10.1016/j.ejvs.2021.01.009. Epub 2021 Feb 22

SCREENLESS ROUTINE PROCEDURE



SCREENLESS PROCEDURE



Holographic Imaging with the HoloLens Head Mounted System to Enhance Angio Suite Ergonomics During an Endovascular Procedure.

Mialhe C, Raffort J, Lareyre F. Eur J Vasc Endovasc Surg. 2021 May;61(5):849-850. doi: 10.1016/j.ejvs.2021.01.009. Epub 2021 Feb 22

VOICE COMMAND



NUMERICAL ZOOM



DEPTH OF FIELD





NUMERICAL ZOOM X 2



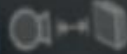




4% de 3 Gy
mGy/min 17.7



20 cm



105 cm



↓ 9 cm

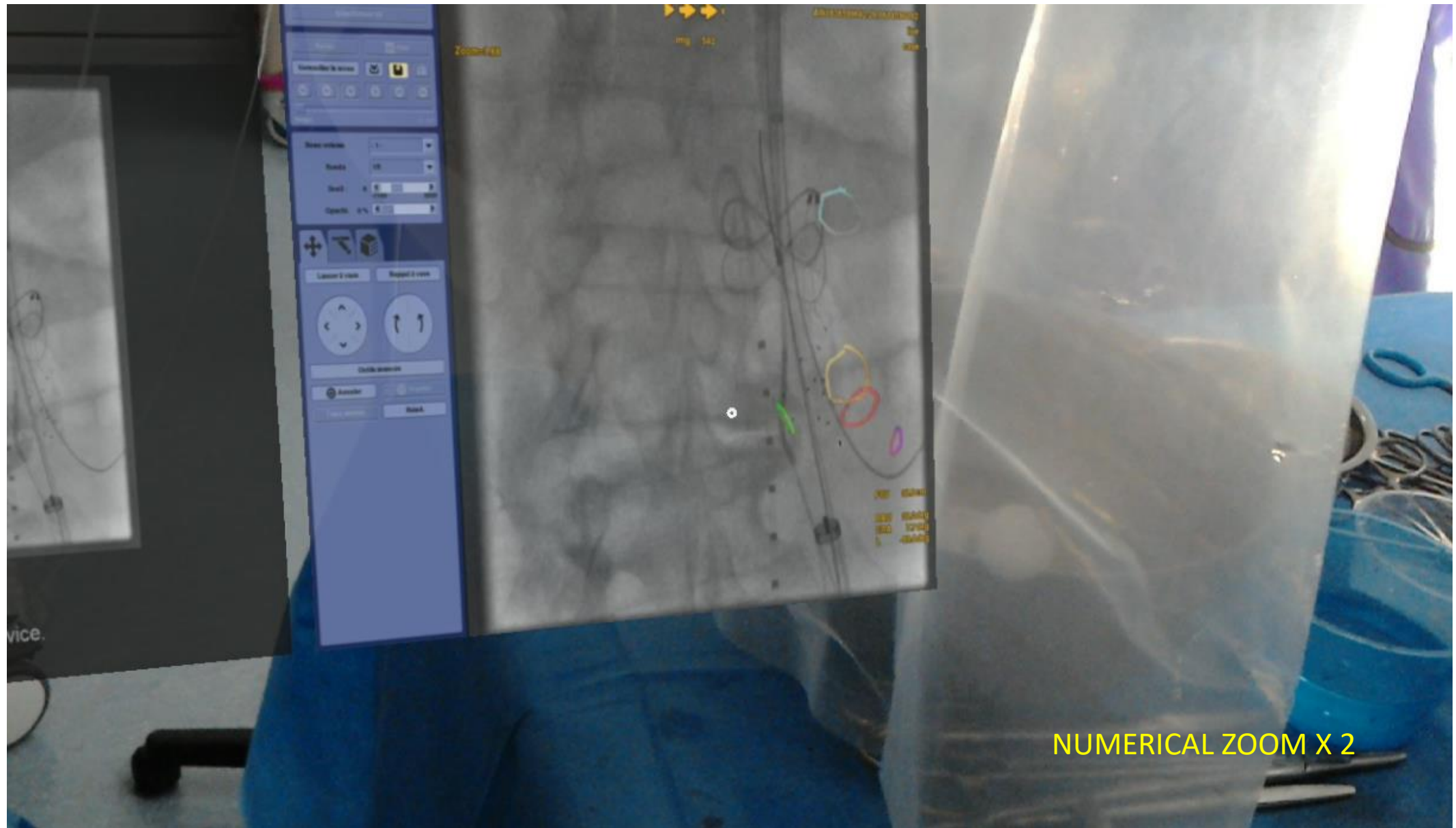
Pivot 16 deg

Arceau -15 deg

L -89 deg



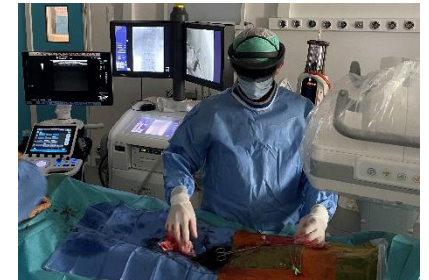
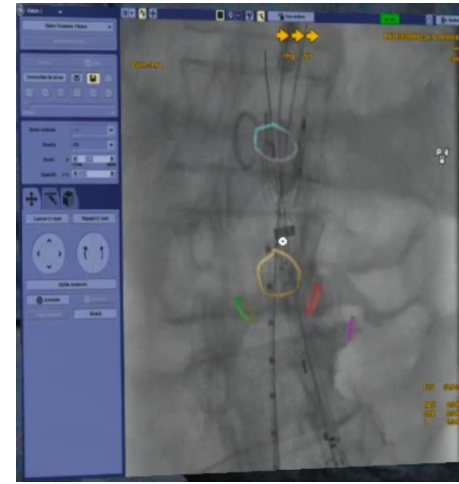
NUMERICAL ZOOM X 2



NUMERICAL ZOOM X 2

CONCLUSION

- Interventional Holography: POC demonstrated
- Operating behavior more comfortable
- V1 version to be implemented
 - Latency
 - Holograms location
- 3 Hybrid Rooms equipped for routine use (GE, Siemens, Ziem)
- 69 consecutive IH procedures
- New Ergonomy: screenless procedure



➔ « *HOR hololensing concept* »