



L'INSTITUT
MUTUALISTE
MONTSOURIS



Une (brève) histoire de l'imagerie coronaire

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CONFLITS D'INTERETS :

Consulting : The Medicines Company, Boston Scientific,
St Jude Medical

Mes héros de la coro...

1962

HARRY SALTZMAN and
ALBERT R. BROCCOLI PRESENT

THE FIRST JAMES BOND FILM!

IAN FLEMING'S

DR. NO

TECHNICOLOR



SEAN CONNERY AS **007**

ORSONA **ANDRESS** · JOSEPH **WISEMAN** · JACK **LORD**

DAWSON · MARSHALL
KITZMILLER · GAYSON

BERNARD
LEE

Screenplay by
MAIBAUM HARWOOD MATHER
Directed by
FRANK **YOUNG**

Produced by
HARRY **SALTZMAN**

Presented by
ALBERT R. **BROCCOLI** · **EON PRODUCTIONS**



F. Mason SONES, Earl K SHIREY

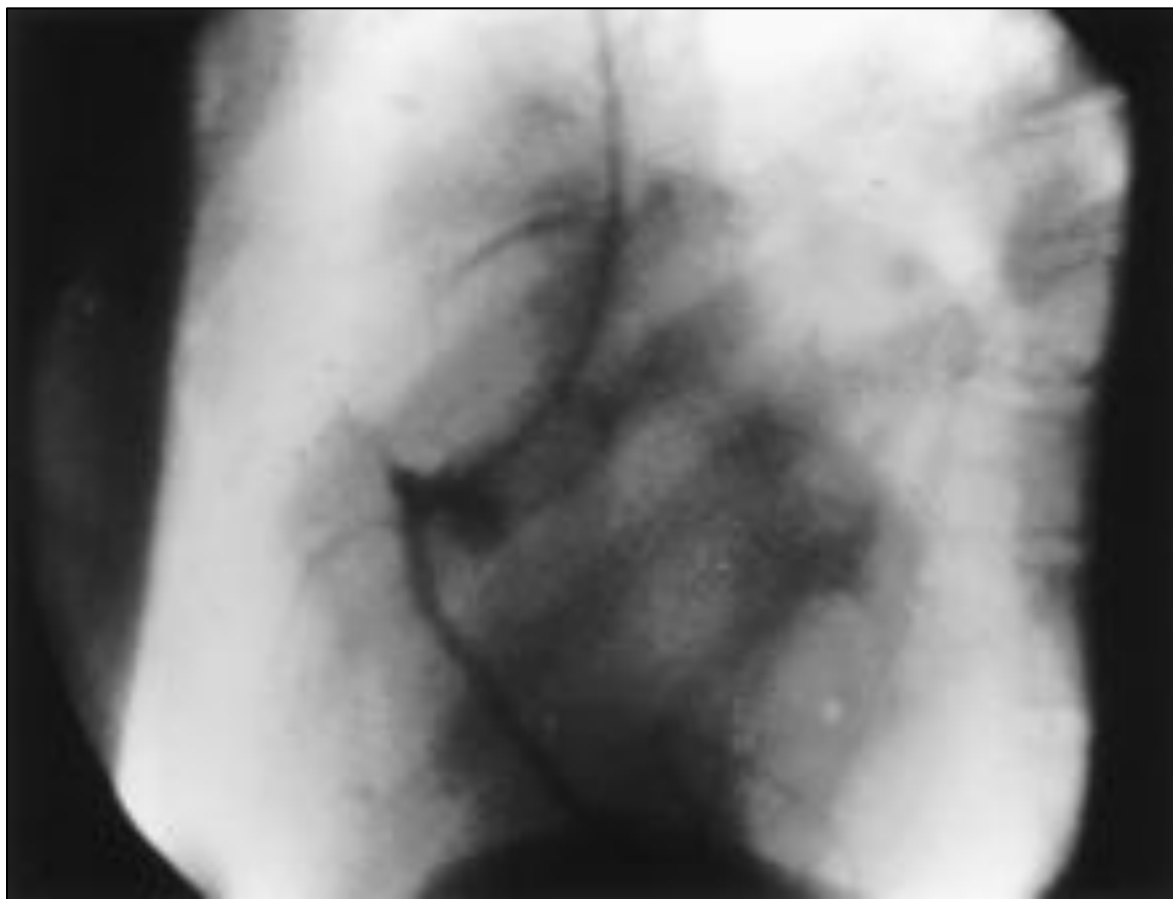
“Cine coronary arteriography”

Mod Concepts Cardiovasc Dis. 1962;31:735-8.



F. Mason SONES Jr





30 Octobre 1958, Cleveland Clinic

« When the injection began, I was horrified to see the right coronary artery become heavily opacified and realized the catheter tip was actually inside the orifice of the dominant right coronary artery.

I shouted, 'Pull it out!' Our combined reaction times to accomplish withdrawal of the catheter consumed from three to four seconds, which meant that approximately 30 cc of 90% Hypaque had been delivered into the right coronary artery. I was of course horrified because I was certain that the patient would develop ventricular fibrillation.

At that time we did not have direct current defibrillators and knew nothing about the application of closed chest cardiac massage. »

“I climbed out of the hole and ran around the table looking for a scalpel to open his chest in order to defibrillate him by direct application of the paddles of an alternating current defibrillator. I looked at the oscilloscope tracing of his electrocardiogram and it was evident that he was in asystole rather than ventricular fibrillation.

I knew that an explosive cough could produce a very effective pressure pulse in the aorta and hoped this might push the contrast media through his myocardial capillary bed. Fortunately, he was still conscious and responded to my demand that he cough repeatedly.

After three or four explosive coughs, his heart began to beat again with initially a sinus bradycardia which accelerated to sinus tachycardia within 15 to 20 seconds. He then made a perfectly uneventful recovery with no neurological deficit or other sequelae”



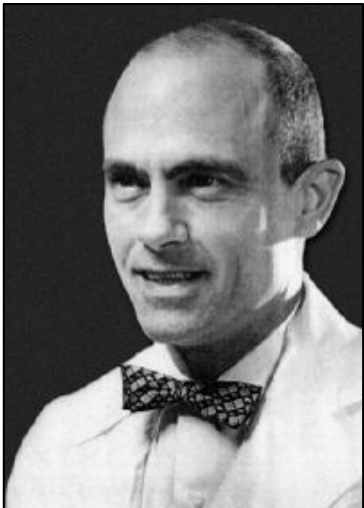
Il y avait eu des précédents...



- **Stig Radner:**

An attempt at the roentgenologic visualization of coronary blood vessels in man . Acta radiol. 1945;26(6):497-502.

Ponction aortique transternale et injection de contraste dans la racine aortique

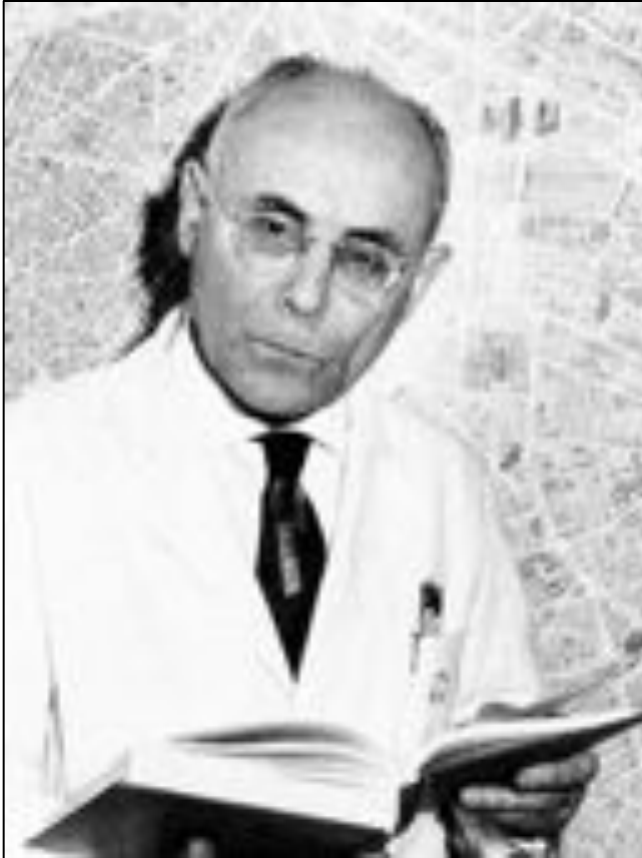


- **Charles T Dotter**

Coronary arteriography during induced cardiac arrest and aortic occlusion. Arch Intern Med. 1959 Nov; 104:720-9.

Injection retrograde dans la racine aortique, après occlusion et durant une asystolie transitoire

Il y avait des réticences ...



- **André Frédéric Cournand**
(Prix Nobel Médecine 1956)

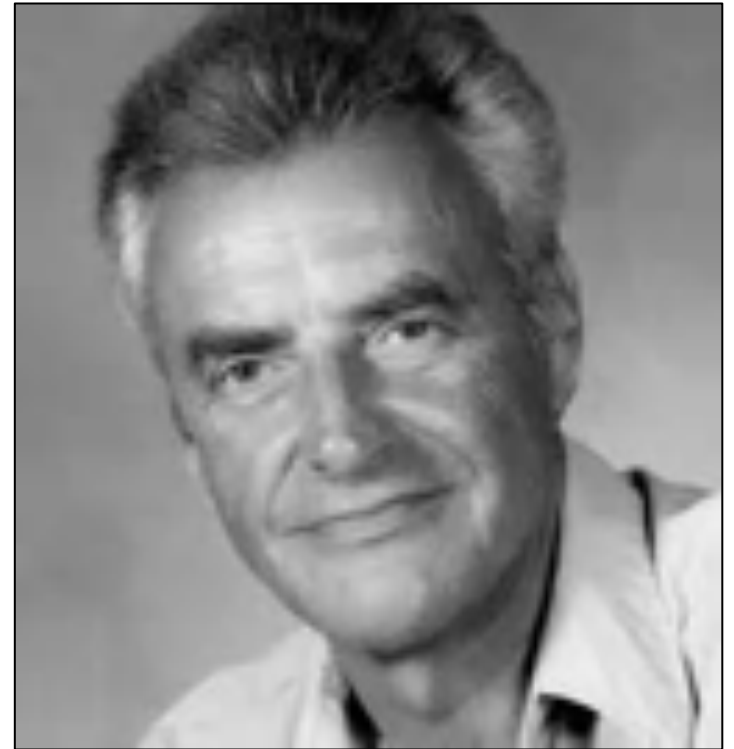
« The danger of introducing an oxygen-free medium into the coronary circulation already seriously compromised by arteriosclerosis is probably great, and anginal pain, dangerous arrhythmias or sudden death are to be feared »

« Asymmetrical hypoxia caused by injection of contrast material into one of the coronary arteries could be fatal »

Il y eu des améliorations techniques...



**Melvin Judkins,
Oregon State University**



**Kurt Amplatz,
University of Minnesota**

- 1967
- Utilisation de la voie fémorale percutanée (technique de Seldinger).
- Utilisation de cathéters préformés spécialement désignés pour les artères coronaires



- 1948 : Premières expériences d'abord transradial par S Radner (10 Fr, dénudation artérielle).

Thoracal aortography by catheterization from the radial artery; preliminary report of a new technique.

Acta Radiol 1948;29: 178–80



- 1988 :Elaboration de la technique moderne par Lucien Campeau (5 Fr, abord percutané) et publication de la première série (100 pts):

Percutaneous radial artery approach for coronary angiography.

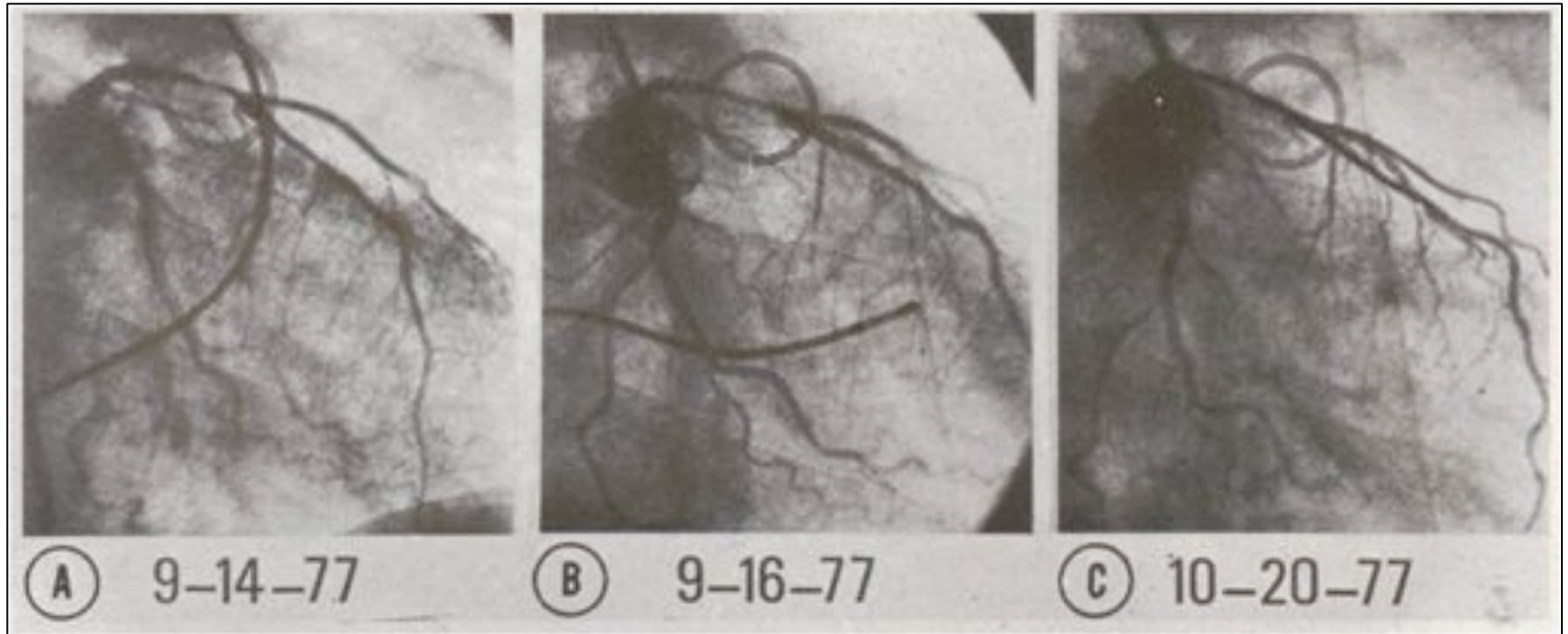
Cathet Cardiovasc Diagn. 1989 Jan;16(1):3-7.



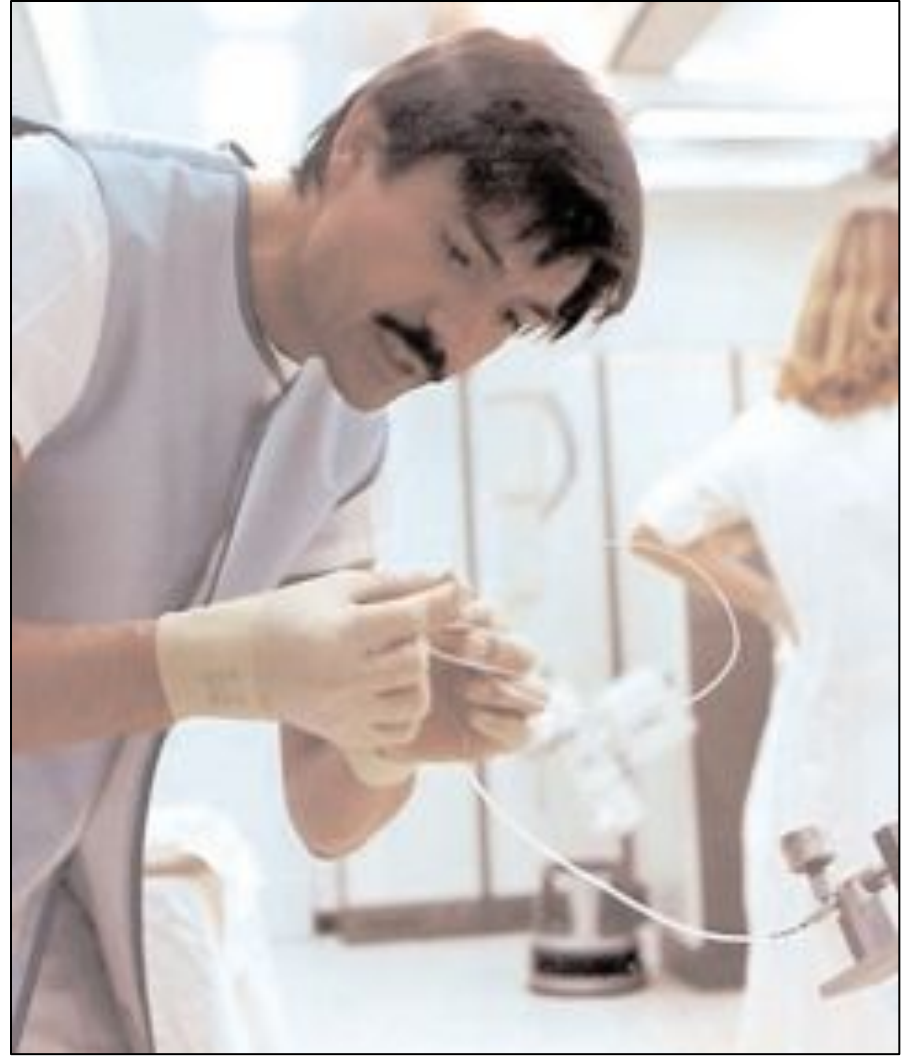
1977



STAR WARS



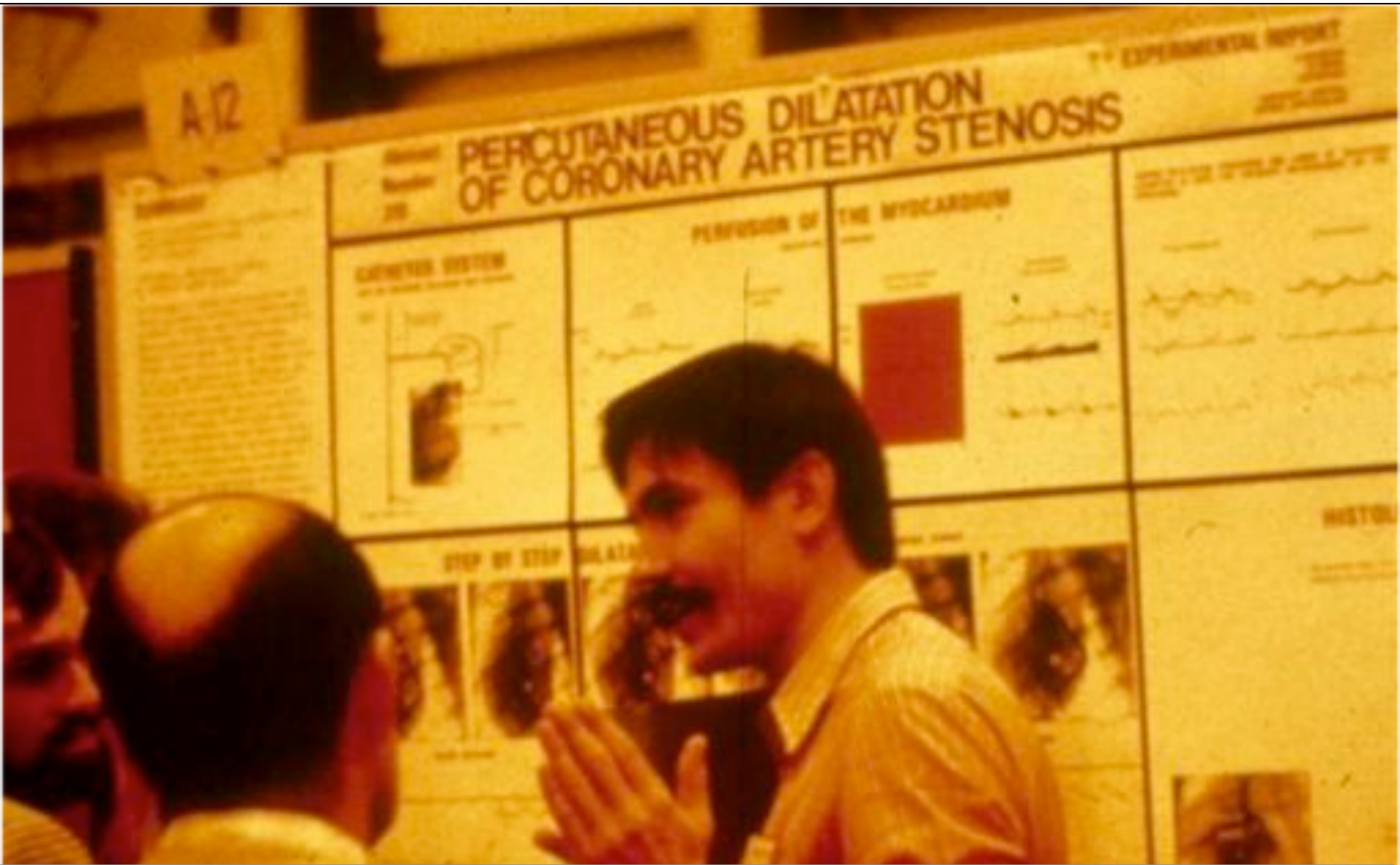
16 Septembre 1977, Hôpital Universitaire de Zurich
IVA proximale / ATC ballon seule / diamètre 3mm
1^{ère} ATC coronaire mondiale



Andreas Grüntzig

Maria Schlumpf

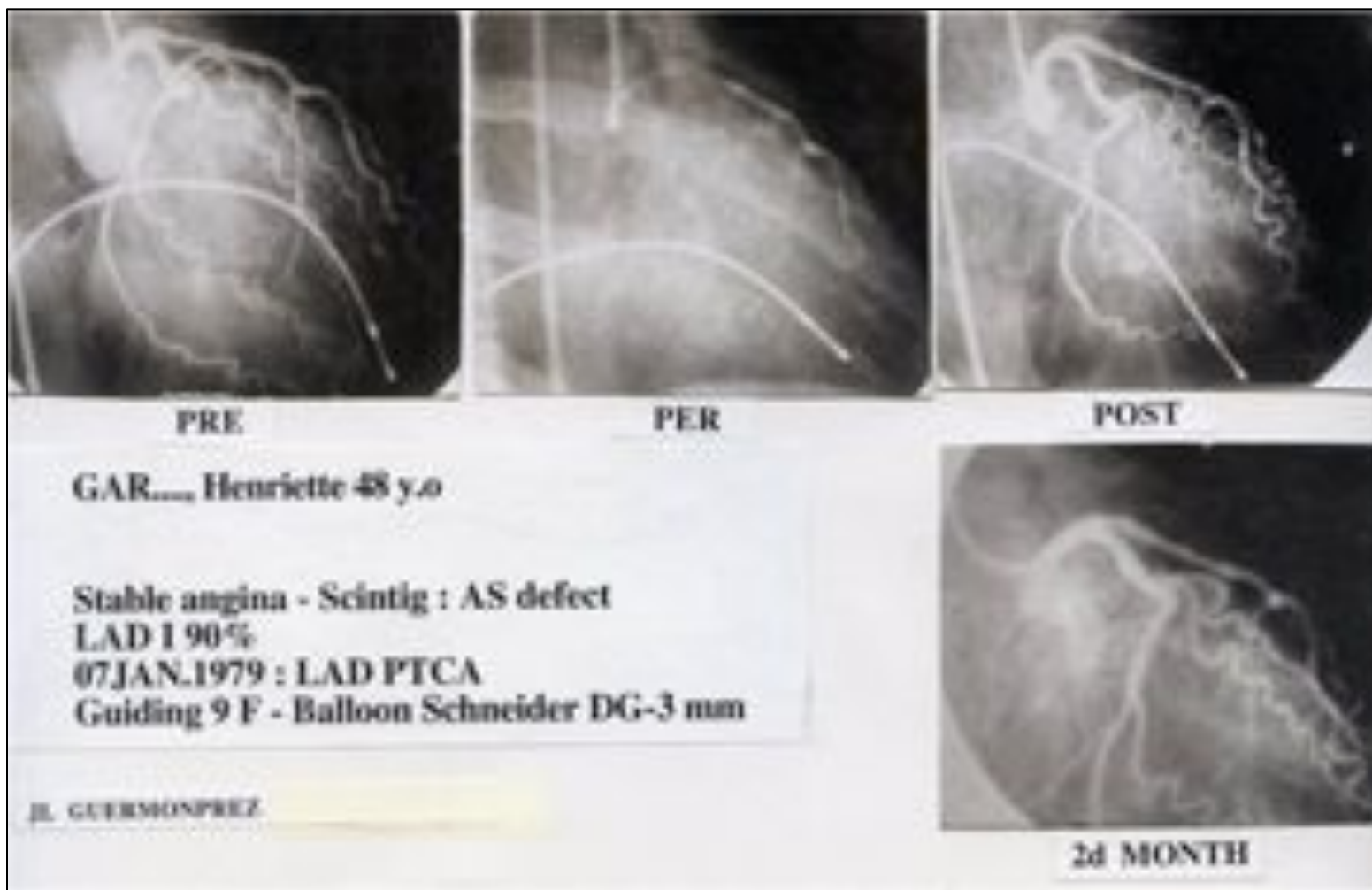




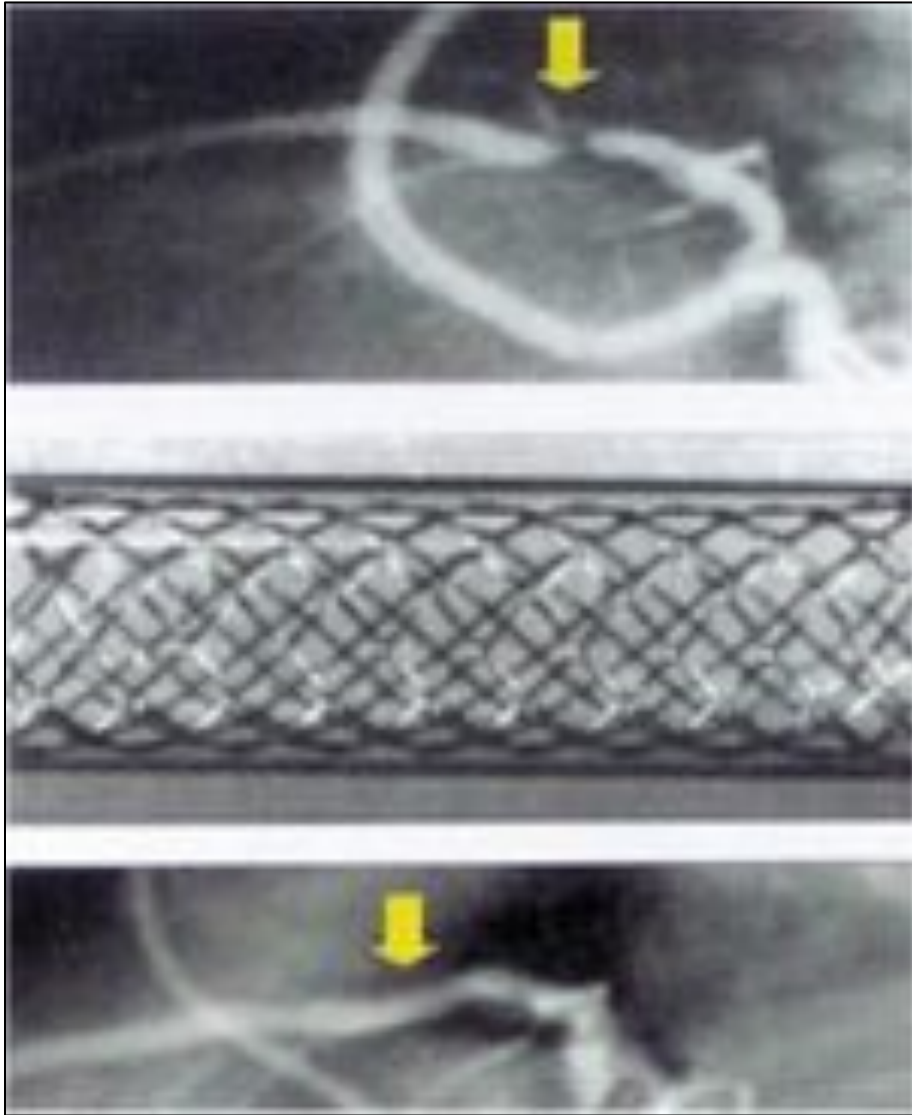
Congrès AHA 1976: Présentation des résultats initiaux d'ATC sur chien



**Dr Spencer B King:
« This will never work.. »**



7 janvier 1979, CH Versailles
1^{ère} ATC Française



28 Mars 1986
CHU Toulouse
Dr Jacques Puel

1^{ère} ATC coronaire avec
pose de stent



1985 : décès de Andreas Gruntzig, Charles Dotter, Melvin Judkins et Mason Sones....

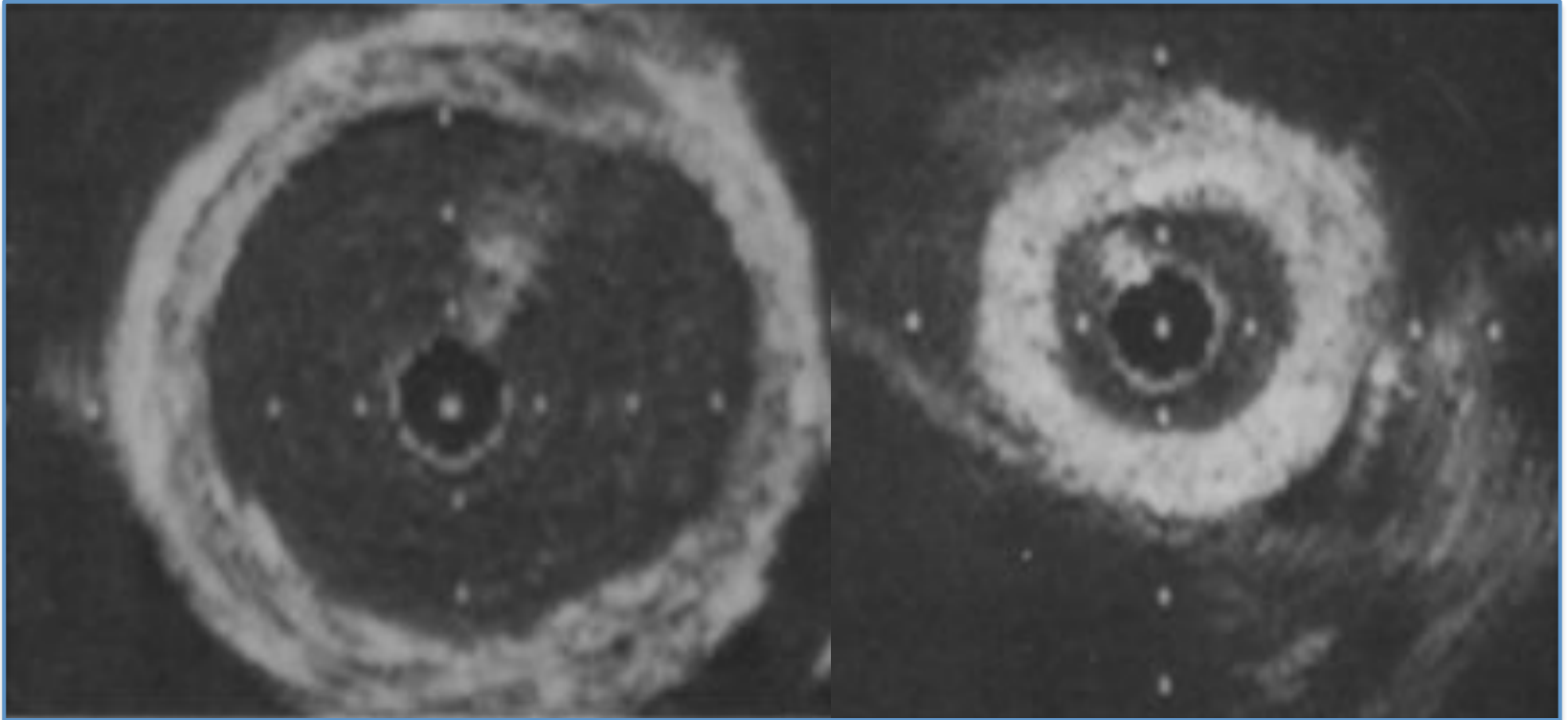
1989

**JACK
NICHOLSON**

**MICHAEL
KEATON**



BATMAN



Yock PG, Linker DT, Angelsen BA

Two dimensional intravascular ultrasound:
technical development and initial clinical experience

J Am S Echocardiography (1989): 2; 296-304



Paul Yock



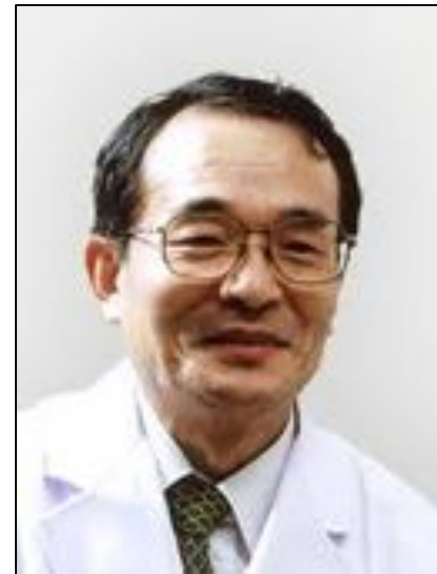
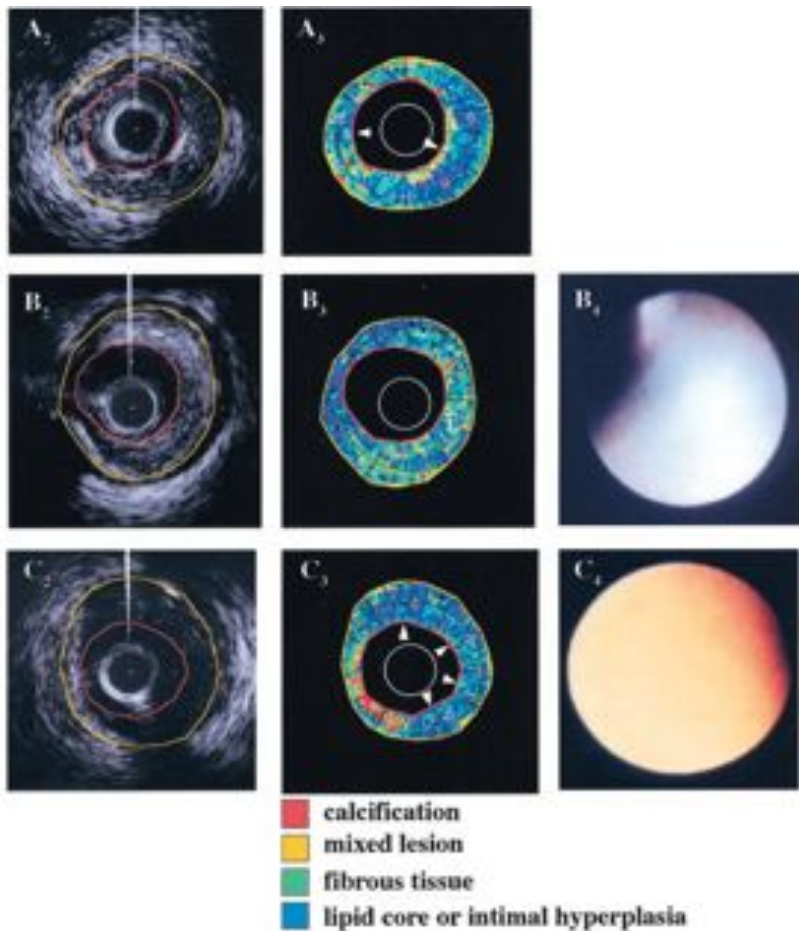
Nicolaas Bom

1971 : Nicolaas Bom et son équipe (Université Erasme, Rotterdam) développent une sonde d'échographie intracardiaque à haute fréquence pour imager les structures mobiles avec une haute résolution

Bom N et al.

Ultrasonic viewer for cross-sectional analyses of moving cardiac structures.

Biomedical Eng. 1971; 6: 500–503, 505.



2001 : H. Fujiwara et son équipe publient la première étude d'histologie virtuelle (IVUS-RF) permettant une caractérisation de la plaque d'athérome *in vivo*

L'utilisation de l'IVUS a permis...

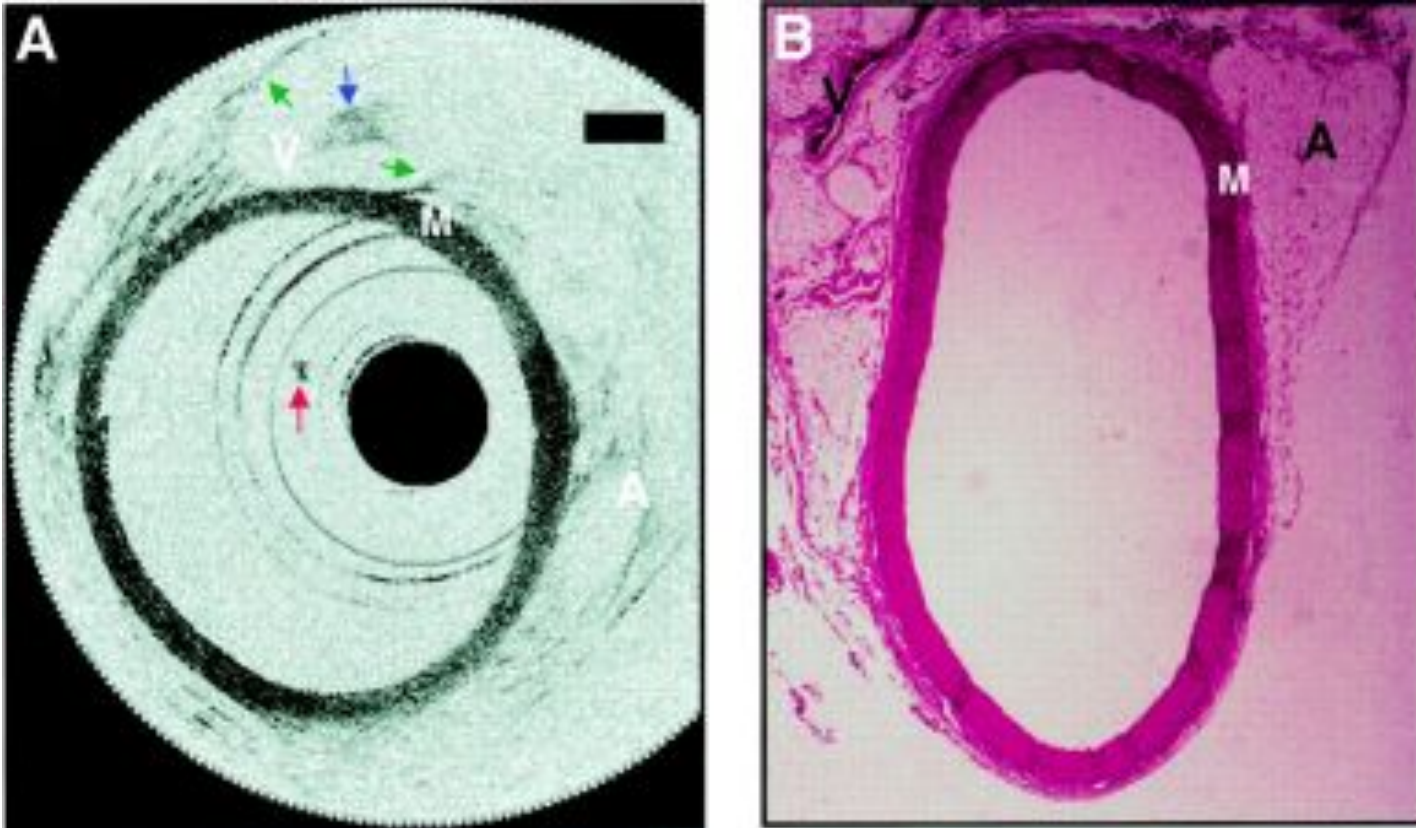
- L'analyse morphologique des plaques in vivo et la mise en évidence des plaques vulnérables (IVUS-RF).
- Les études de régression/progression de plaques.
- L'étude du déploiement des stents et l'optimisation de l'ATC.
- L'étude des propriétés des stents actifs (néoplasie intimale réactionnelle).

1999

MATRIX

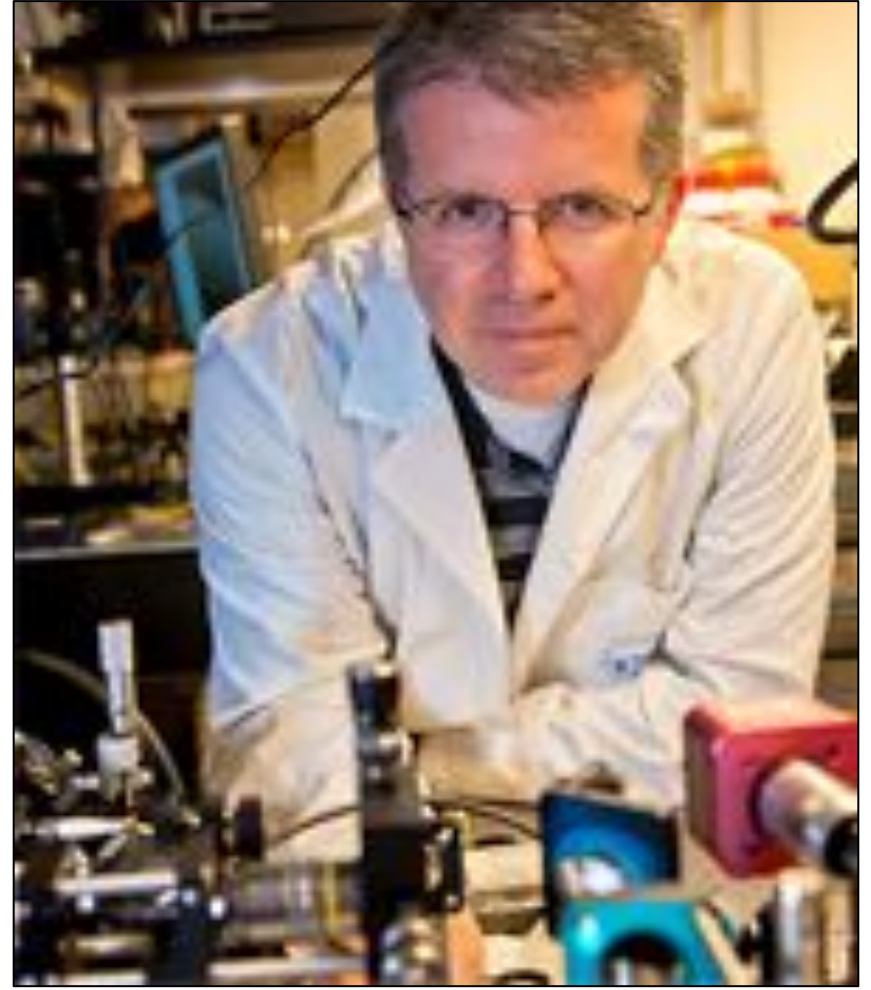


Time Domain Optical Coherence Tomography



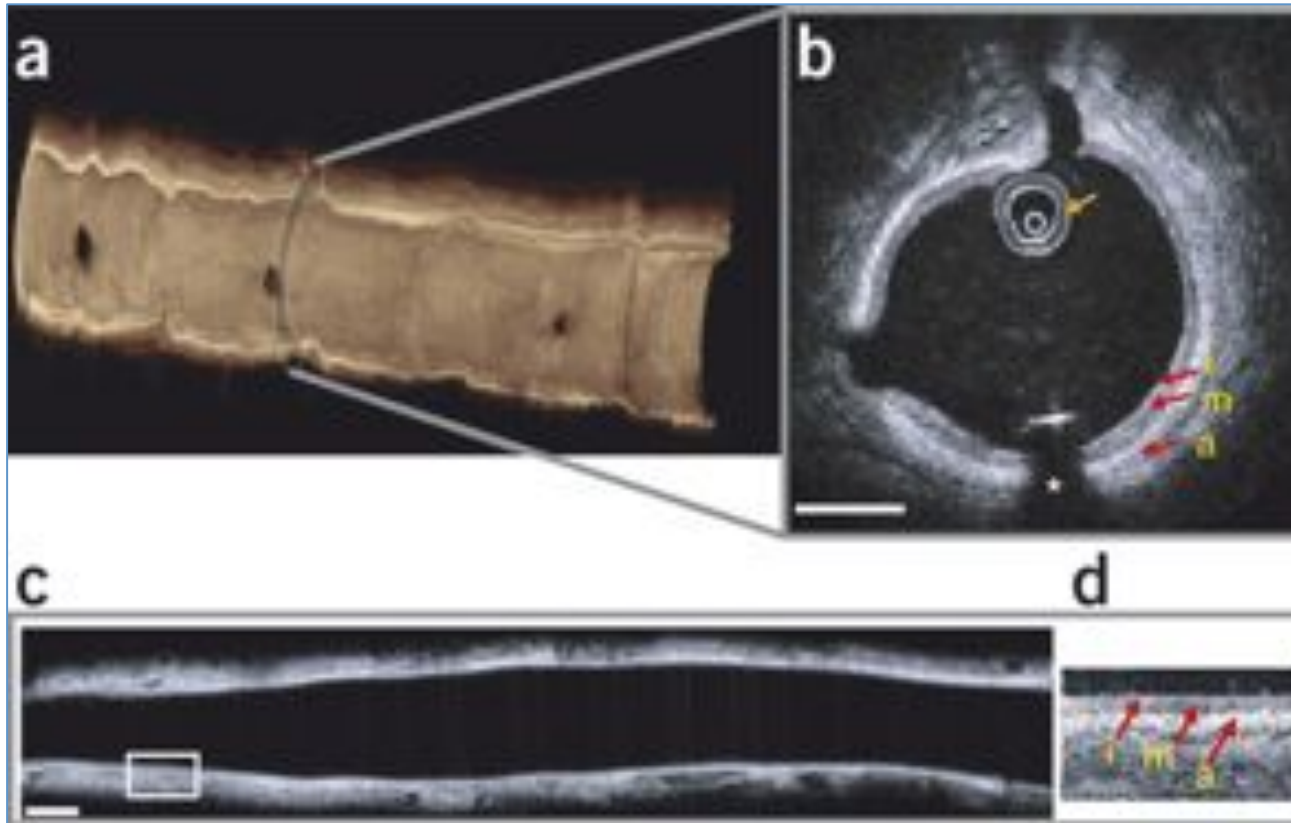
Fujimoto, J.G., S.A. Boppart, G.J. Tearney, B.E. Bouma, C. Pitris, and M.E. Brezinski,

High resolution in vivo intra-arterial imaging with optical coherence tomography. Heart, 1999. 82(2): p. 128-33.



Guillermo Tearney

Optical Frequency Domain Imaging



Yun SH, Tearney GJ, Vakoc BJ et al.

Comprehensive volumetric optical microscopy in vivo. Nat Med. 2006; 12: 1429–1433.



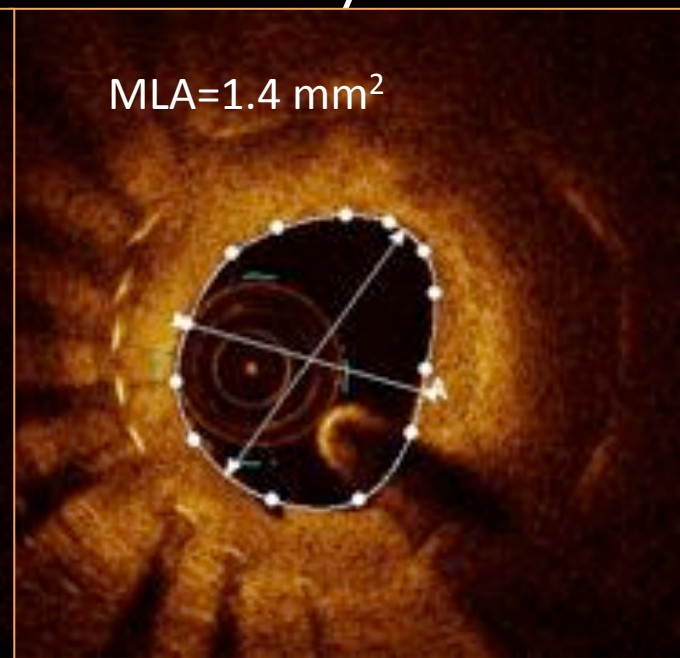
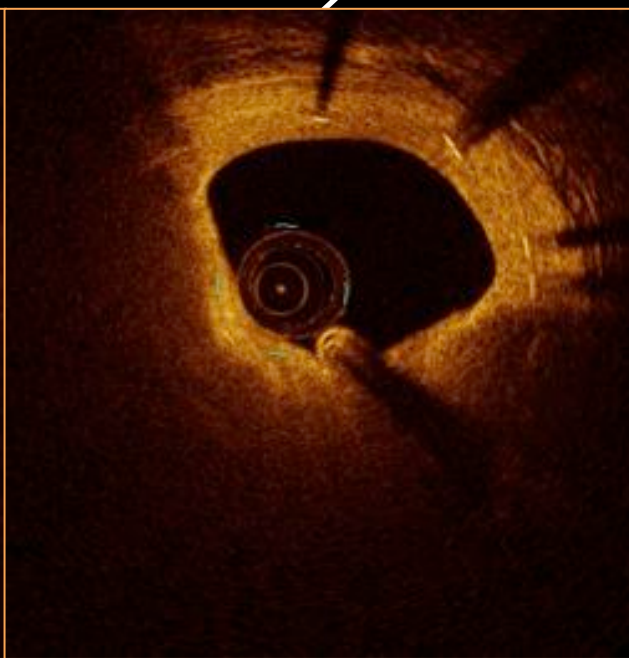
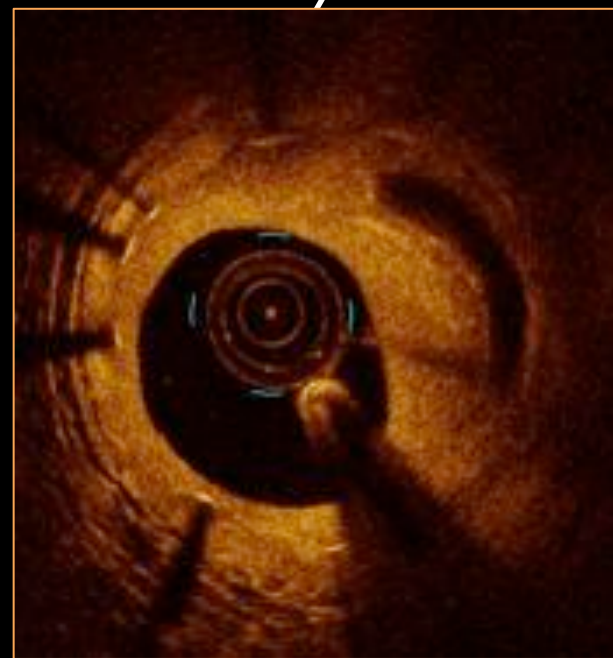
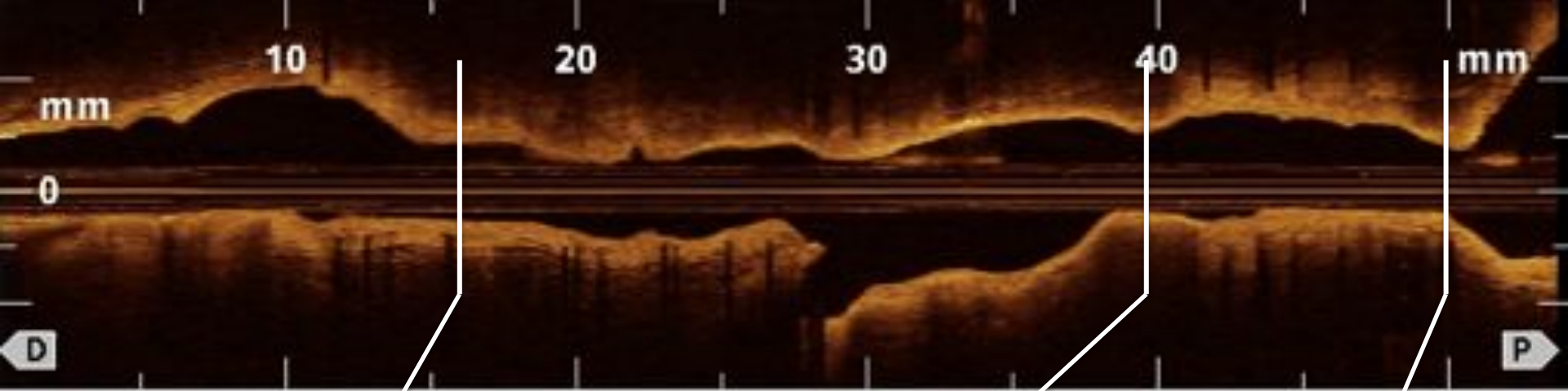
THE UNIVERSITY OF CHICAGO PRESS



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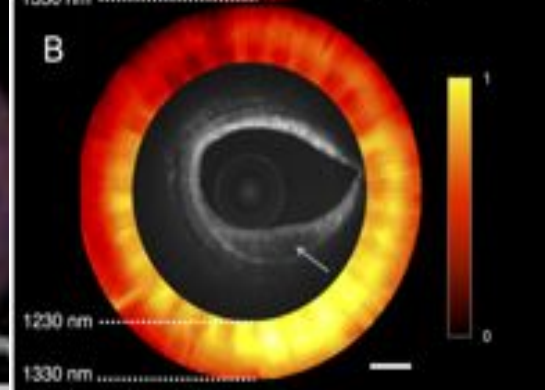
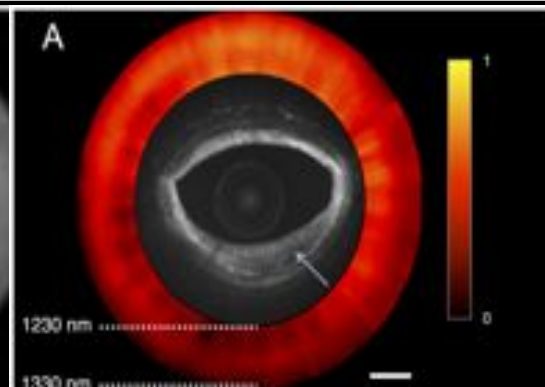
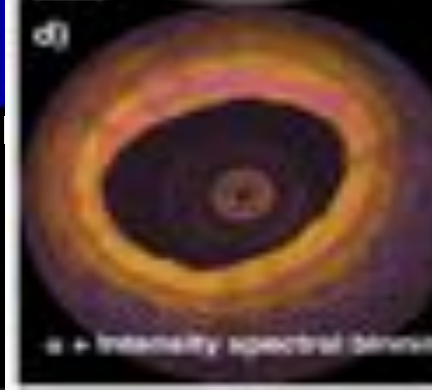
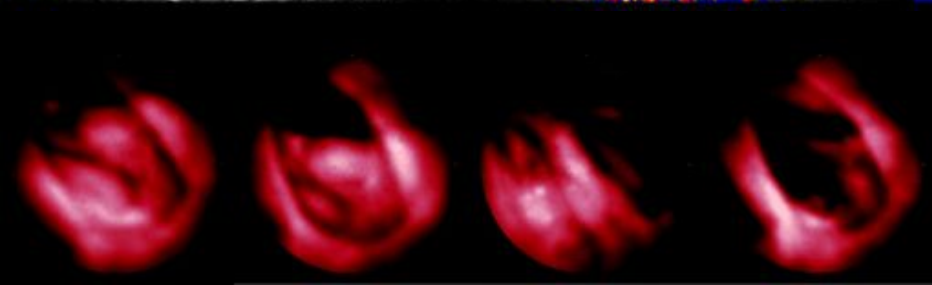
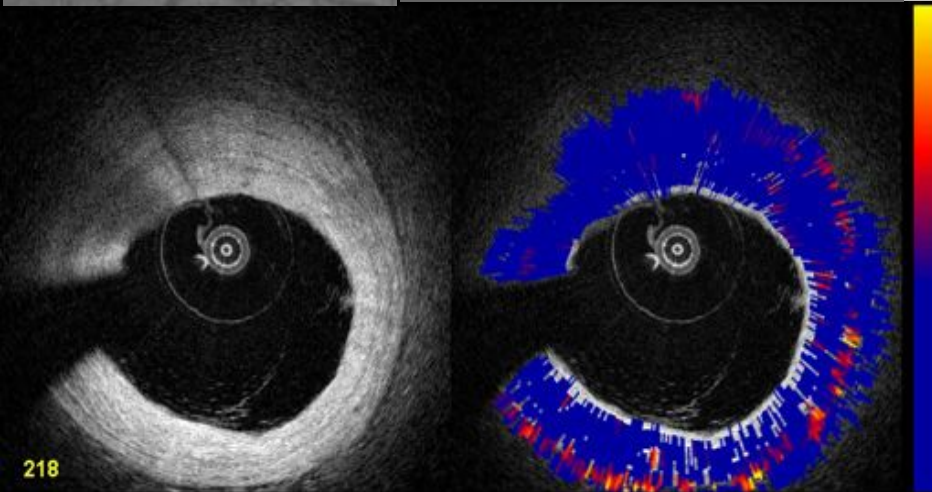
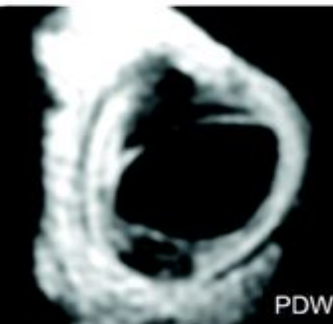
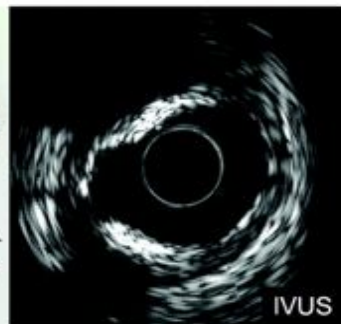
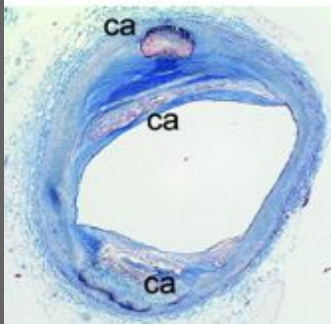
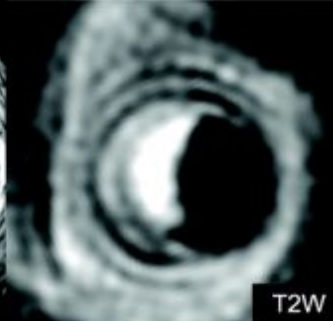
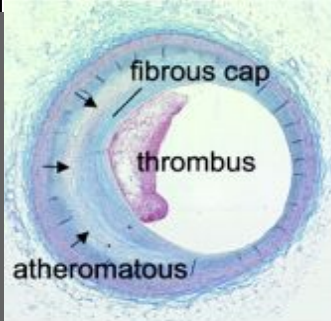
L'utilisation de l'OCT a permis...

- L'analyse des mécanismes des SCA.
- L'analyse des mécanismes de thrombose de stent.
- L'étude des processus de réparation artérielle *in vivo*.
- L'étude des propriétés des stents résorbables....
- L'histoire reste largement à écrire...

2020.... ?



LAO 43, CRAN 33
DS 64%, 20.7 mm
Pro Bif Angle: 147
Dis Bif Angle: 71
Pro: 2.6 mm, 2.3 mm
Dis: 1.1 mm, 1.9 mm



THE HUMAN **re**VOLUTION



Something, somewhere went terribly wrong...