# 관상동맥질환에서 중재적 치료의 경험

차 의대 심장내과
조 승 연

대한내과학회잡지 : 제18권 제 9 호

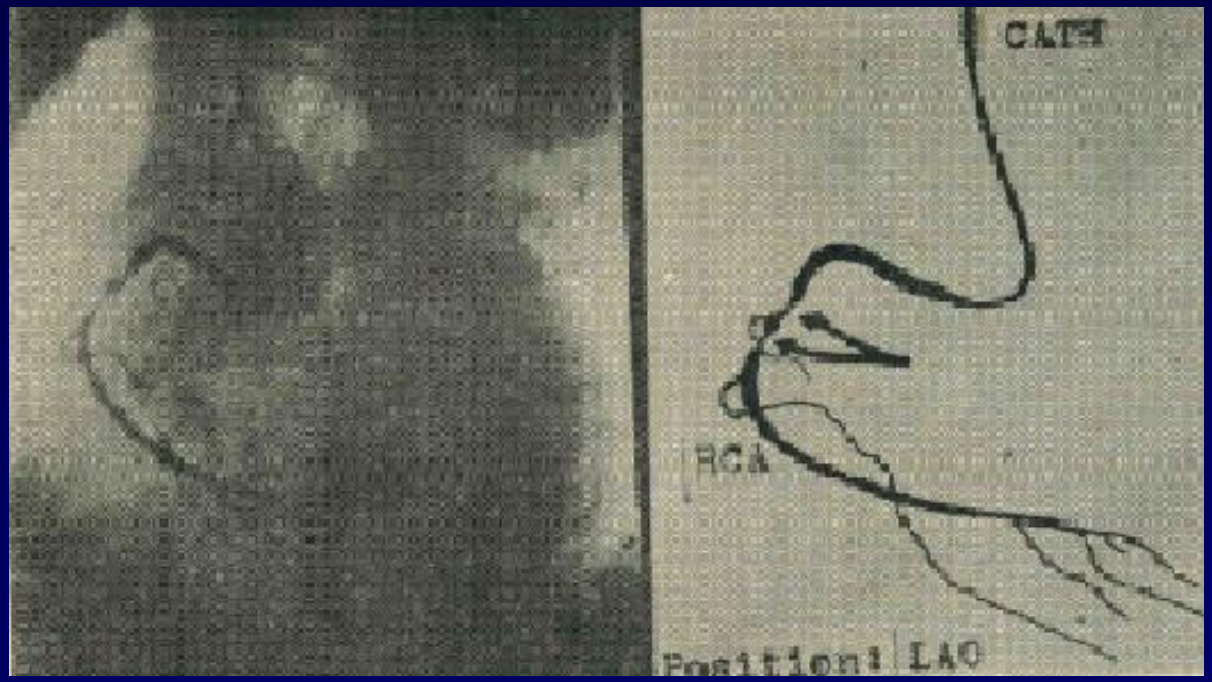
□ 特 輯 □

# 冠狀動脈造影術

## Coronary Arteriography

연세대학교 의과대학 내과학교실

차 흥 도

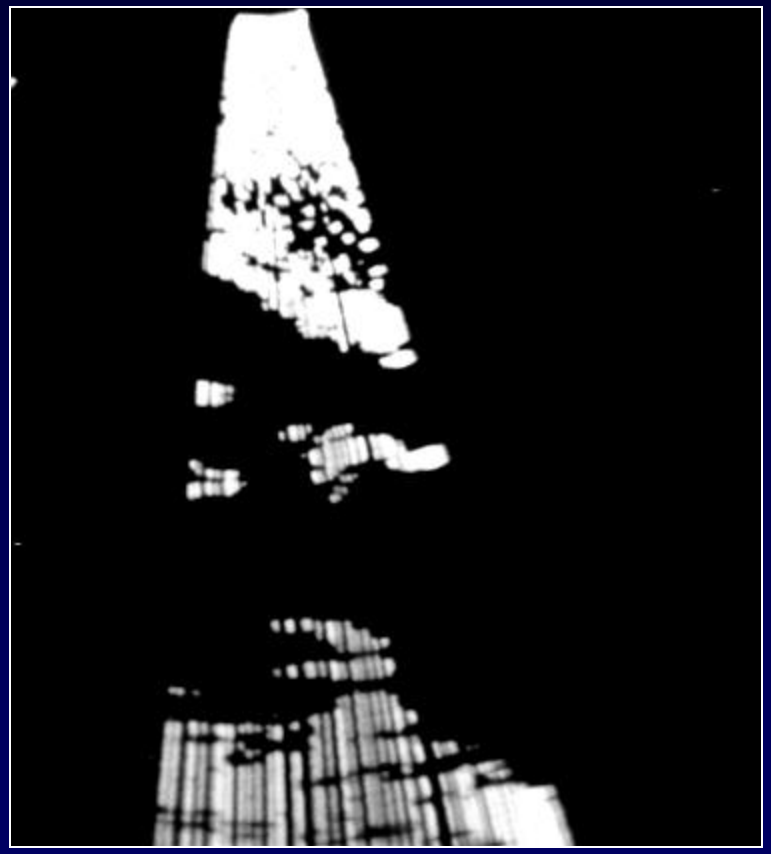


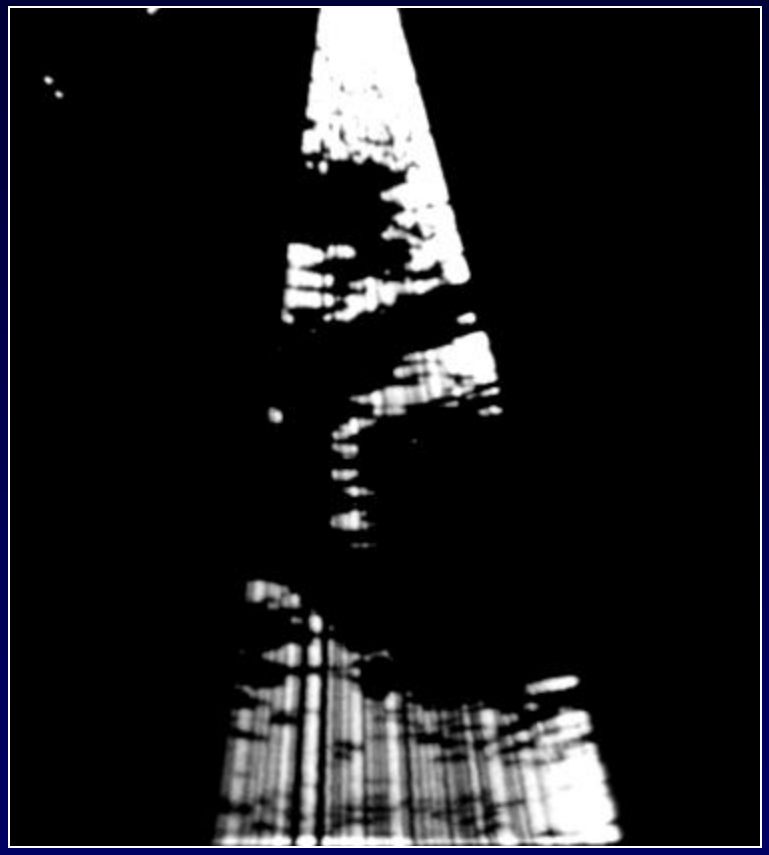

***1972년 1월 29일 국내 최초 관상동맥조영술 시행***

# 세브란스 병원의 최신 진단 장비 (강사 시절)

1. Mechanical 30 도 sector scanner
 (Ekosector 1, Smith Kline Instr)  1979년

2. Cineangiographic system
 (Coroscop-C  독일 Simens 회사)  1980년





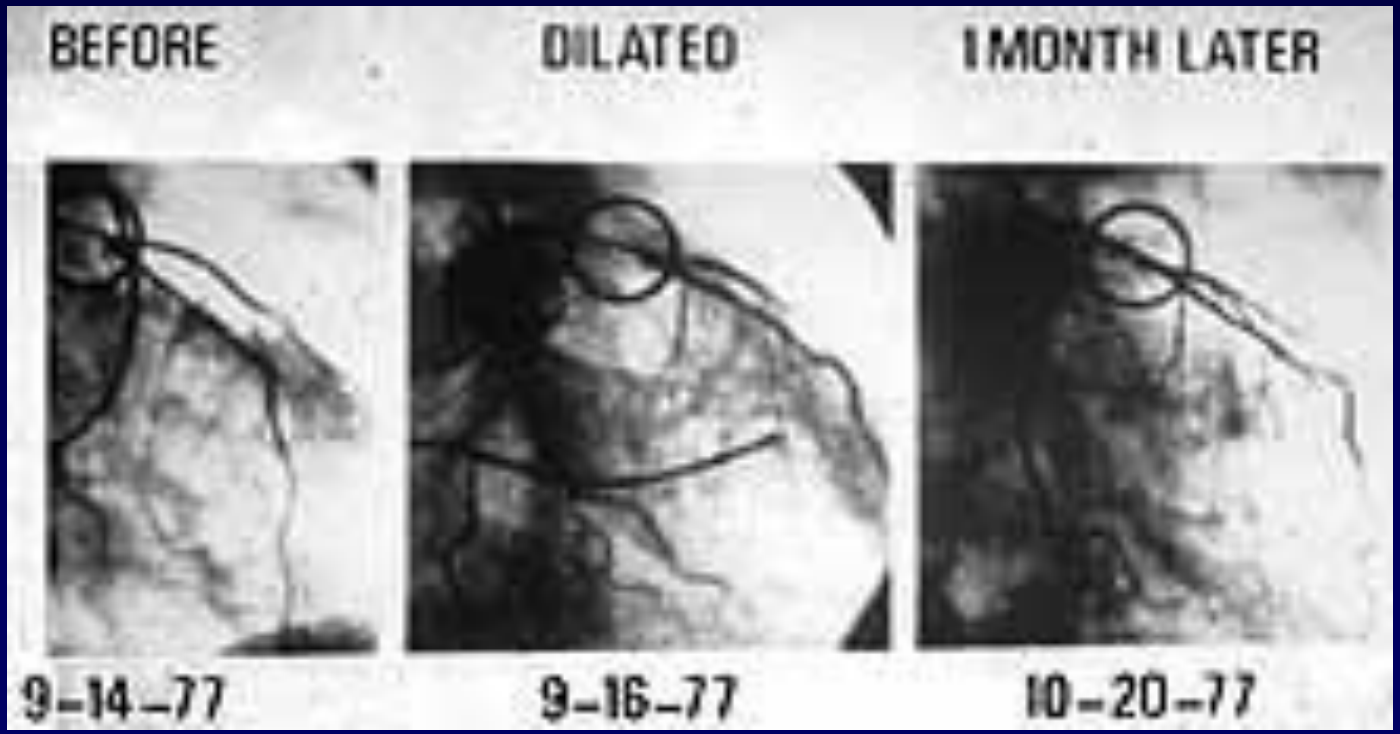
***Prolapse of the anterior mitral leaflet***

# Coronary angiography in a patient with acute inferior MI

*1982년*

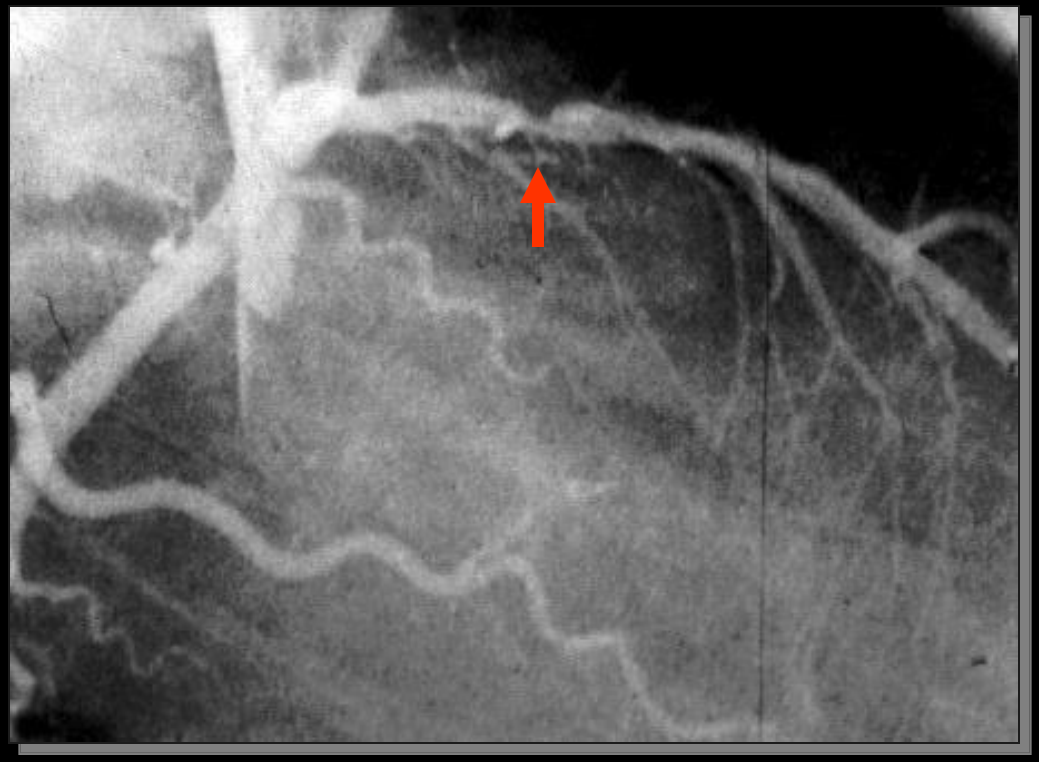
# *Andreas R. Gruentzig*

## *(1939-1985)*

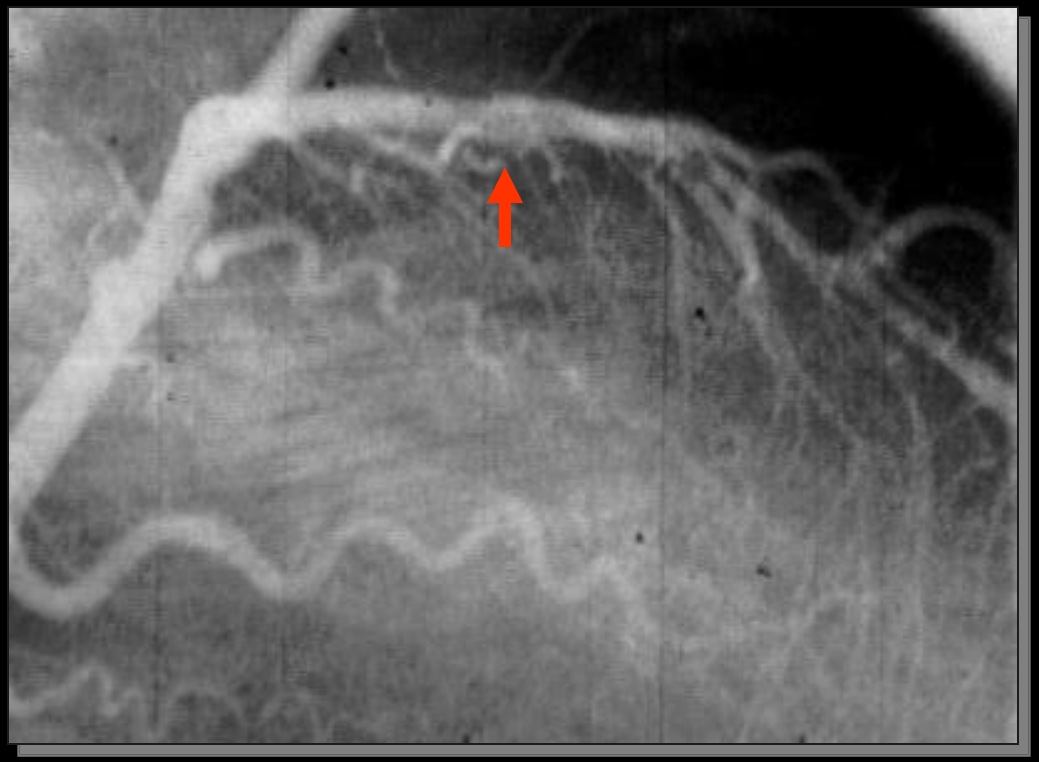


# First Successful PTCA in Korea

Lee YY M/52 #1481430
Dec 29, 1983

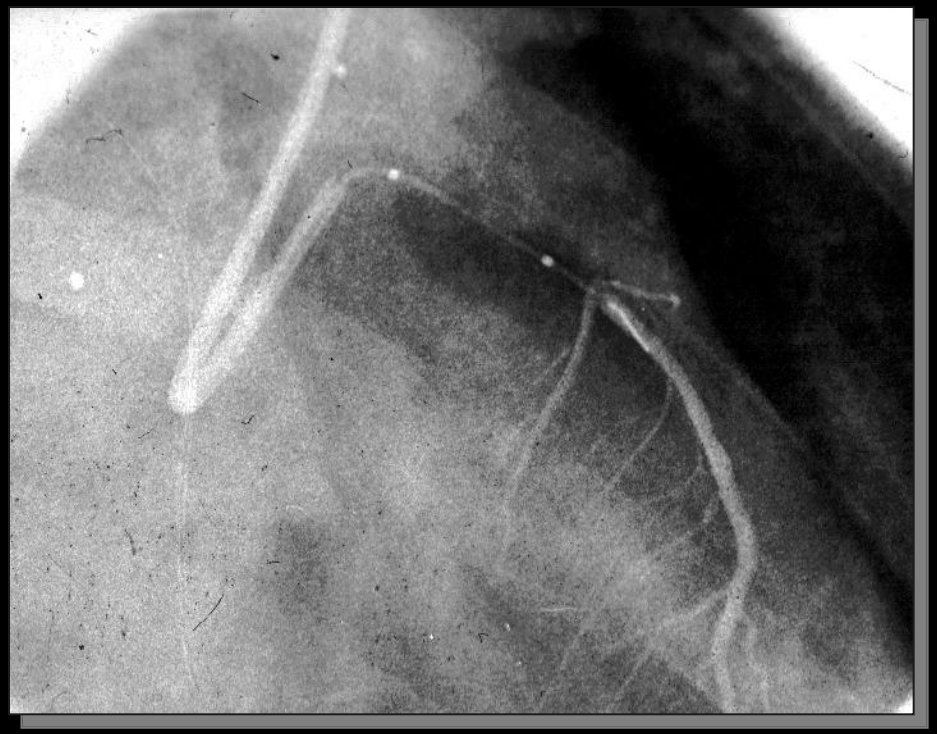


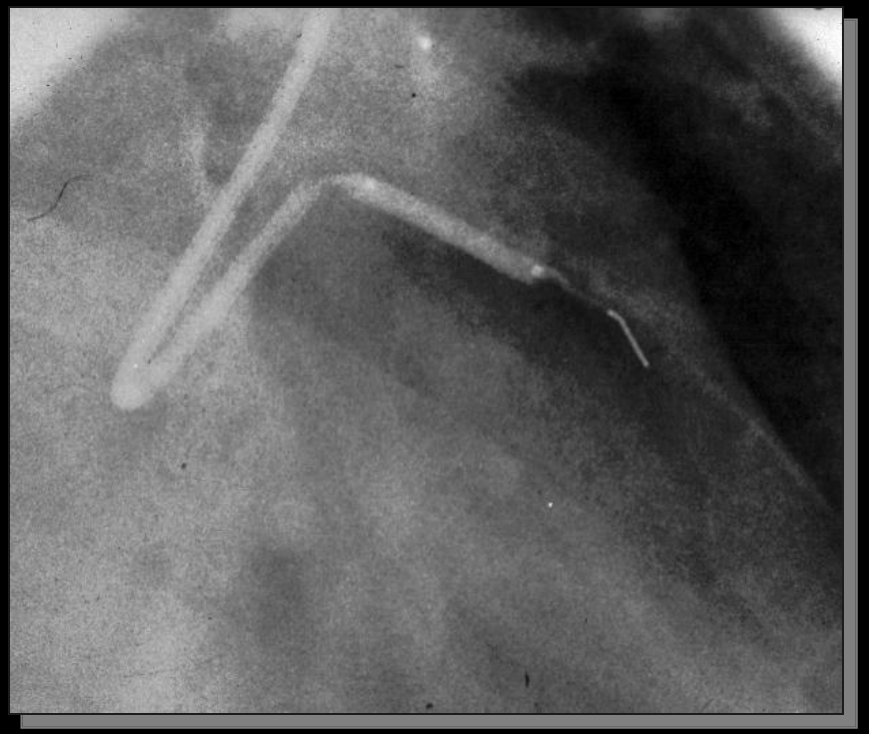
Pre- PTCA



Post- PTCA

# Fixed Guide Wire Balloon System





# Unprotected Left Main PTCA

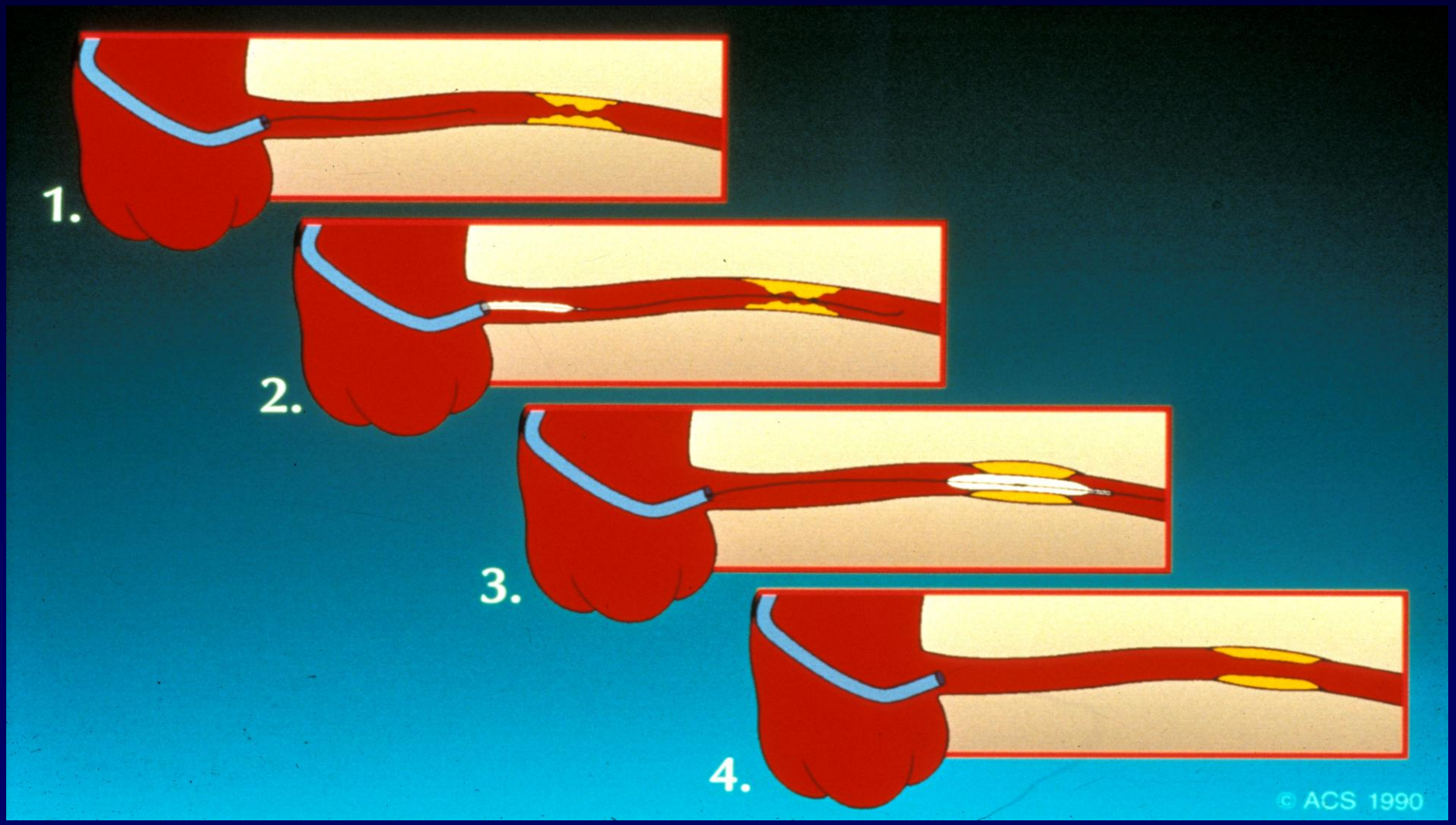
Oh SO M/34 #1160212
Apr 9, 1984

**Pre- PTCA**

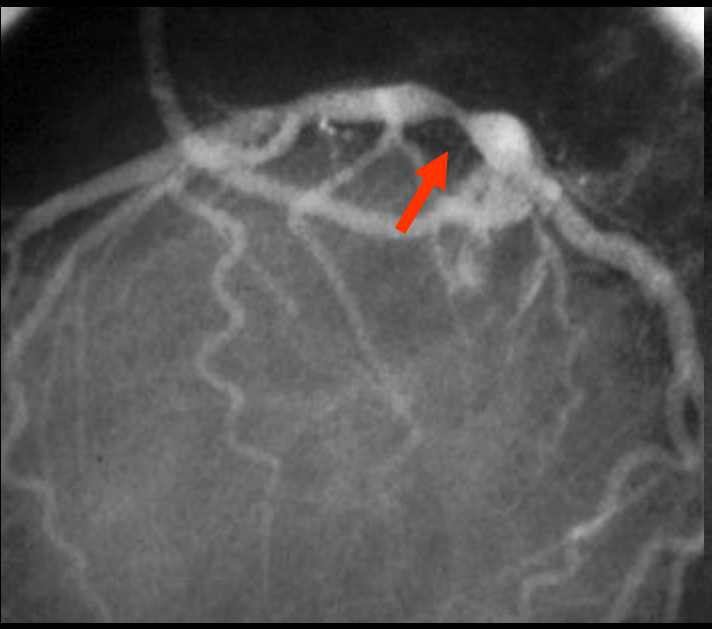
***3.5 mm fixed guide wire balloon***

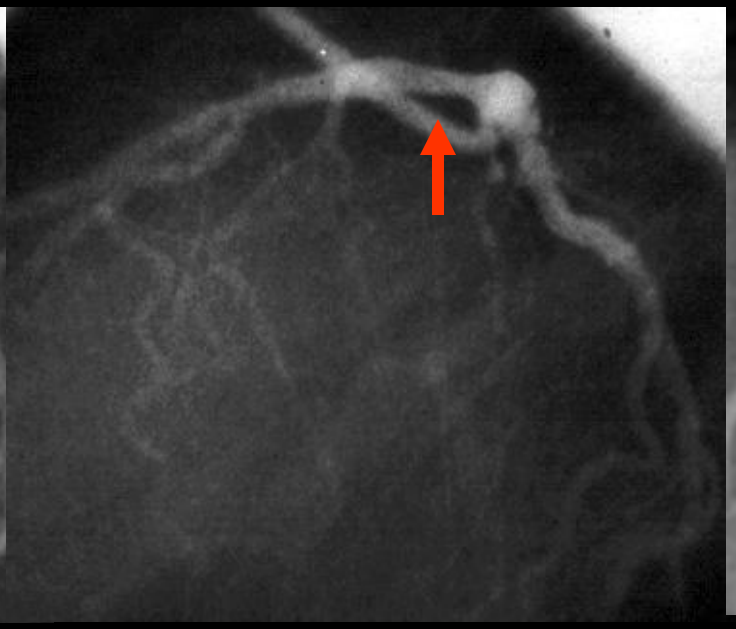
**Post- PTCA**

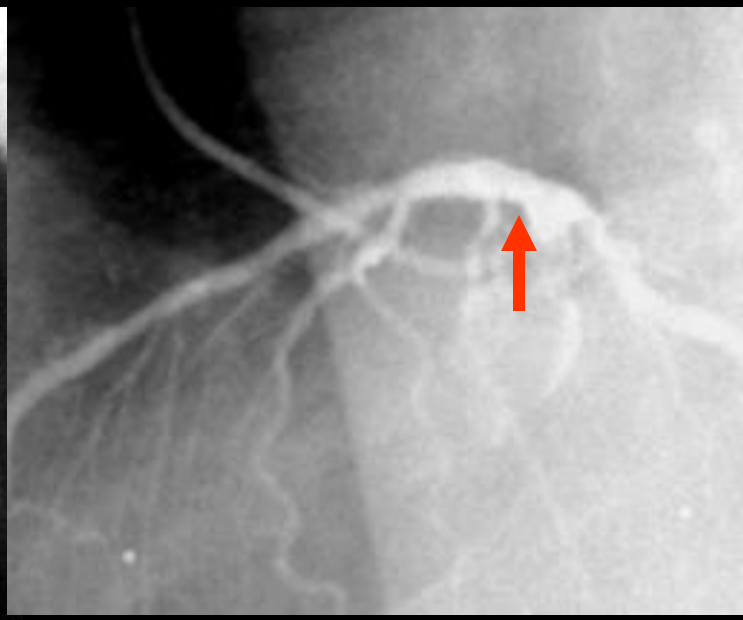
# Steerable guide wire system



Lee SJ F/82







**Pre- PTCA**

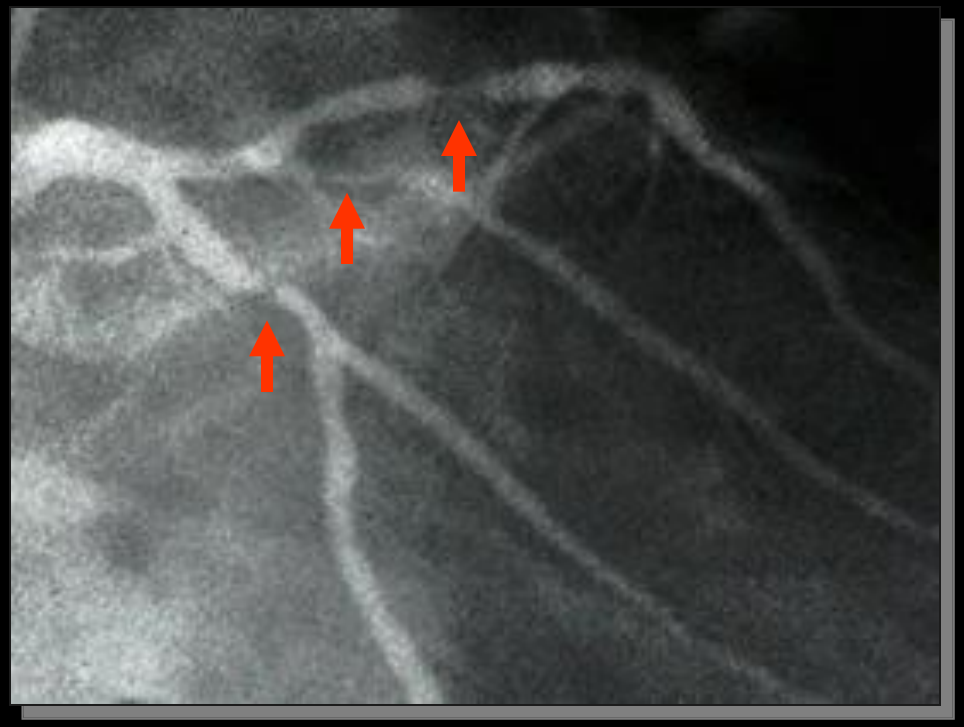
**Post- PTCA**

16 yrs FOLLOW-UP

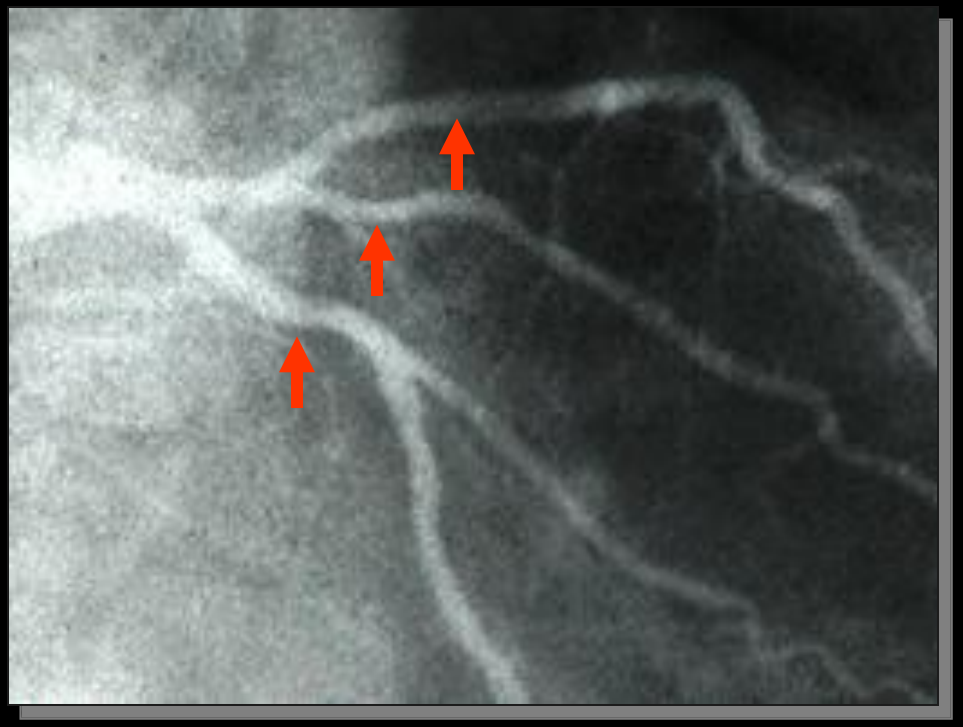
1985-6-7

2001-9-27

# Multivessel PTCA



Pre- PTCA



Post- PTCA

# Characteristics of Lesion Types

## Type A Minimally Complex

- Discrete (length <10mm)
- Concentric
- Readily accessible
- Non-angulted (<45°)
- Smooth Contour
- Little or no calcification
- Not totally occlusive
- Not ostial
- No major side branch involved
- No clot

## Type B Lesions (moderately complex

- Tubular (Length 10 to 20mm)
- Eccentric
- Moderate Tortusosity
- Moderate angulated (>45°<, < 90°)
- Irregular Contour
- Moderate of heavy calcification
- Total occlusive<3 mo old
- Ostial
- Bifurcation lesions
- Some thrombus

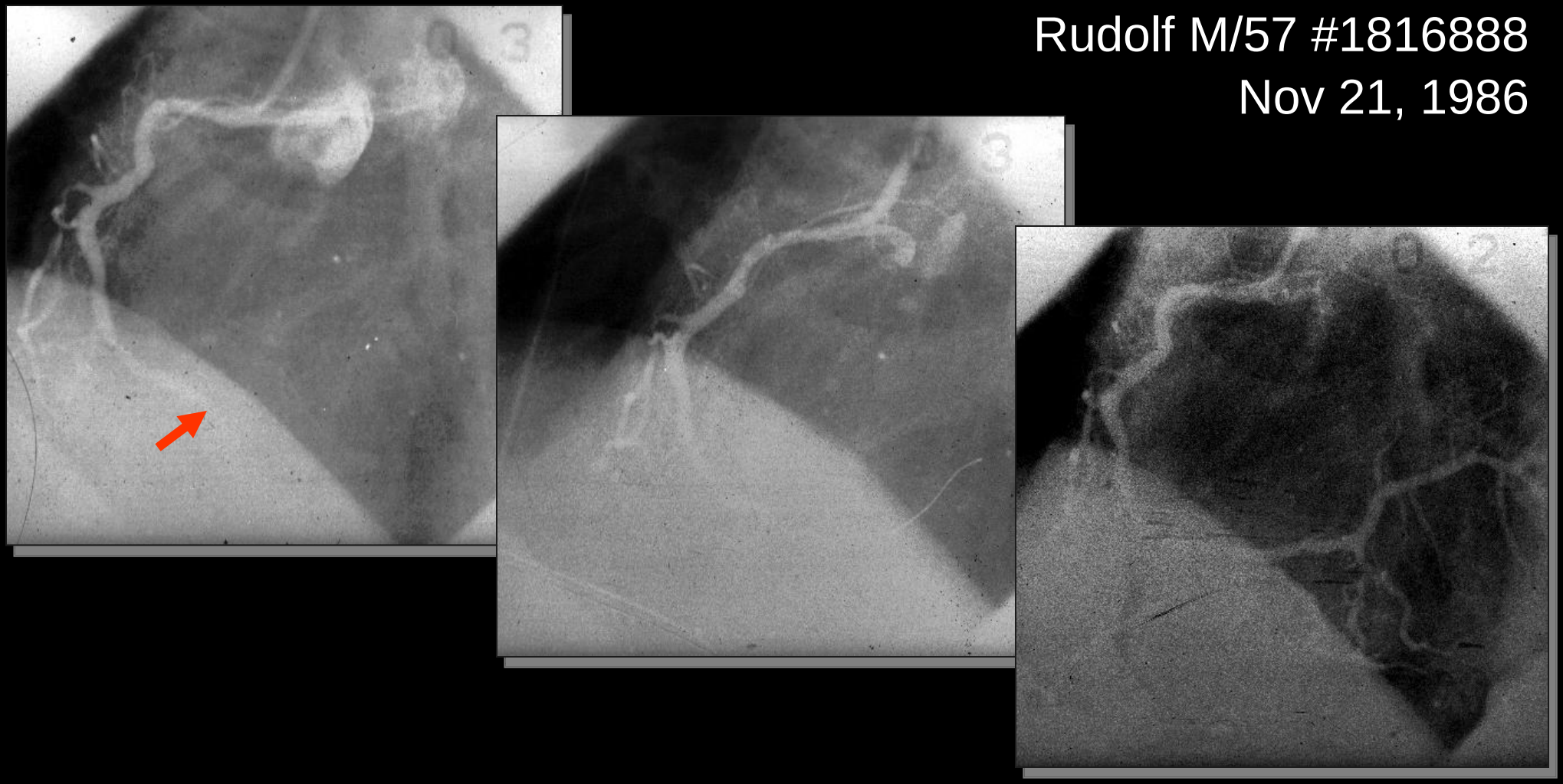
## Type C Lesions (severely complex)

- Diffuse (length>2cm)
- Excessive tortuosity
- Extremely angulated (>90°)
- Total occlusions >3 mo old
- Little or no calcification
- Inability to protect major branches
- Degenerated vein grafts

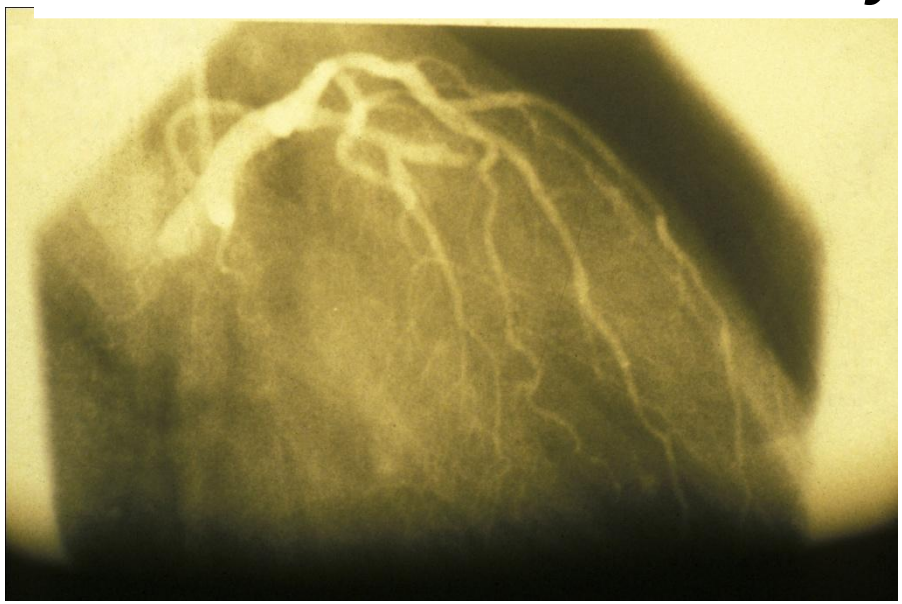
AHA/ACC Task force. J Am Call Cardiol 1988; 12:529-545.

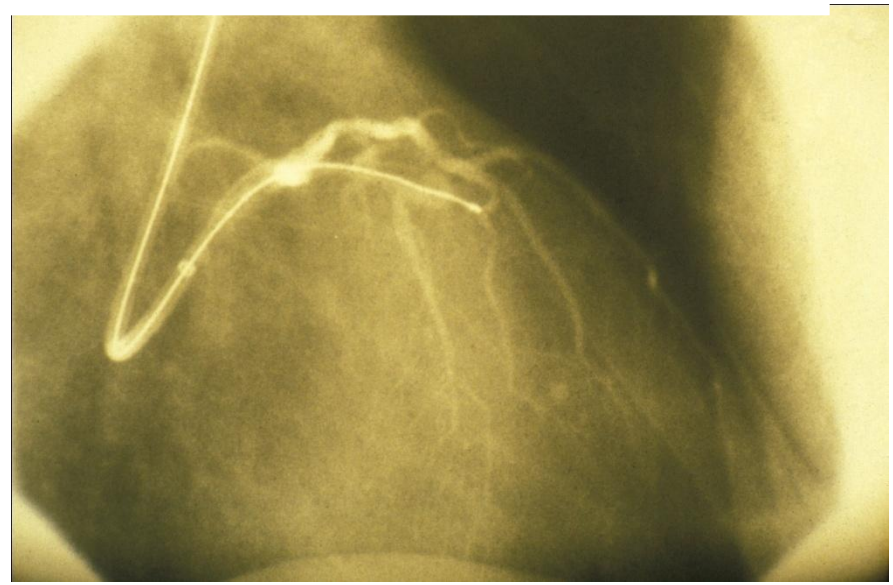
# 1st Direct PTCA in AMI in Korea

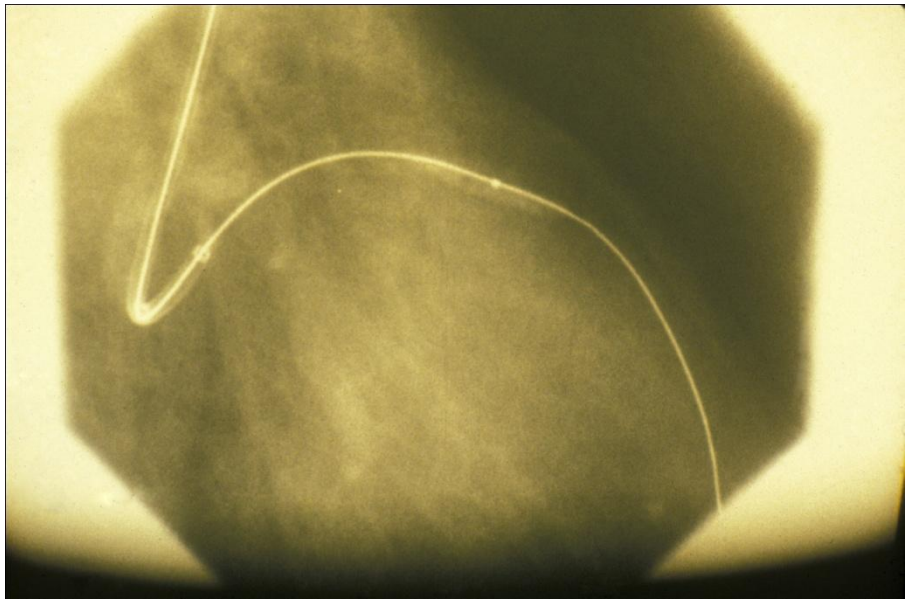
Rudolf M/57 #1816888
Nov 21, 1986

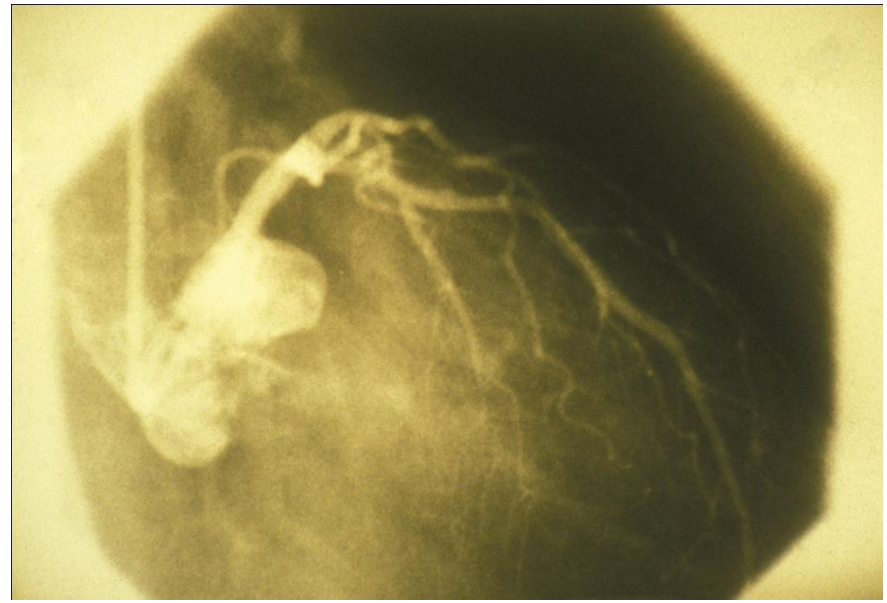


# *CTO PCI with a Magnum guide wire  Shim J K  F 65*
# *May 22,1990*



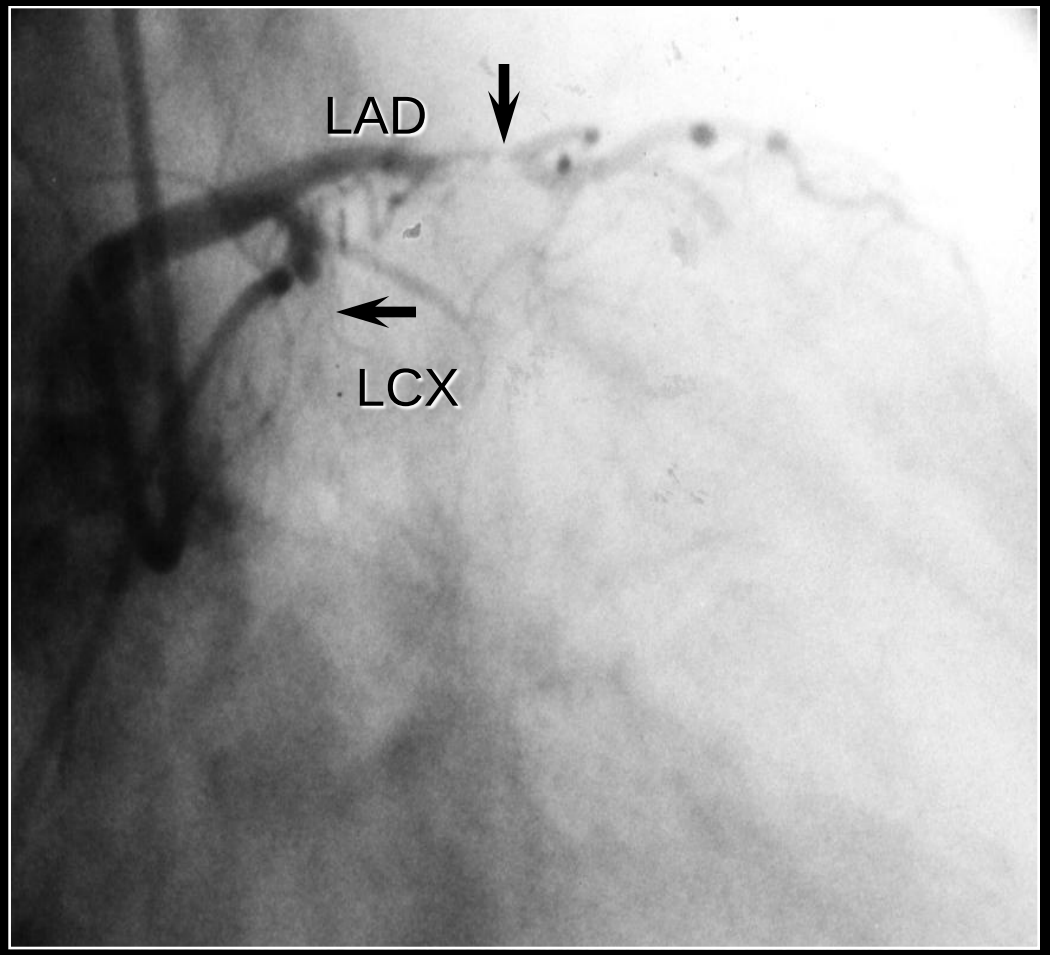


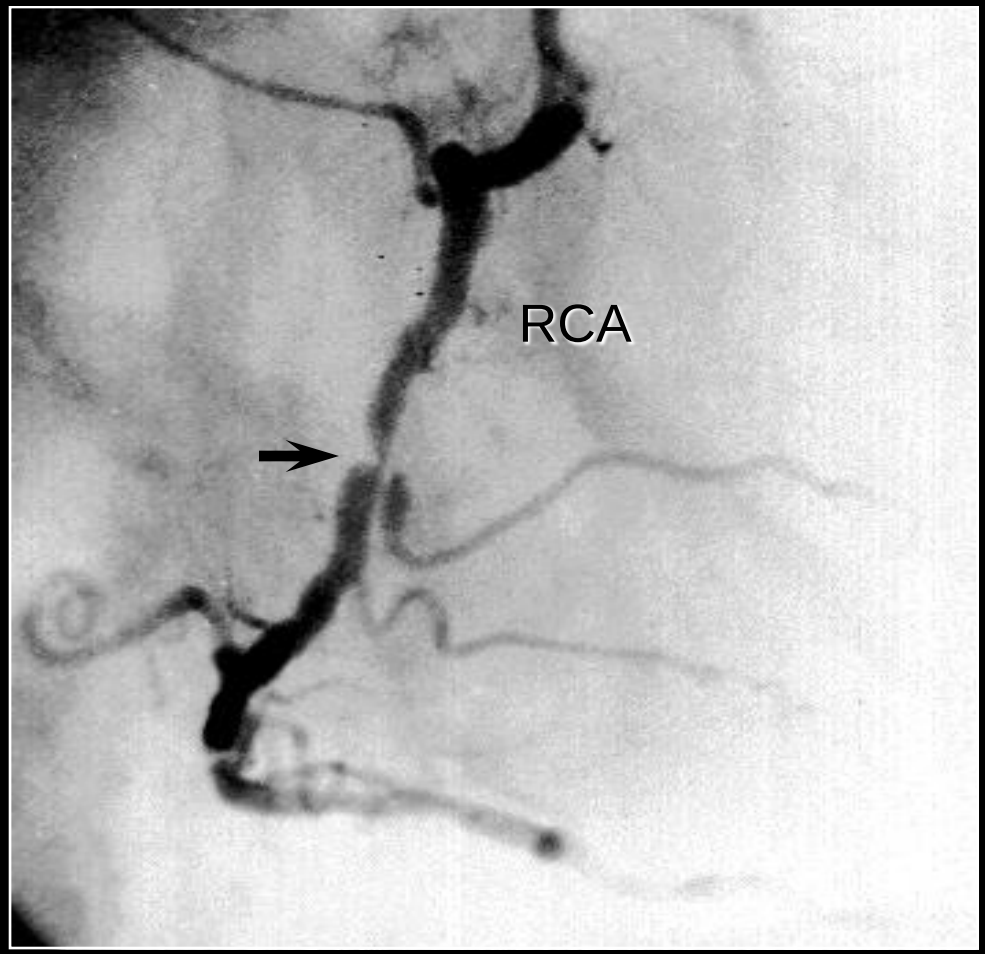




# Very high risk patient

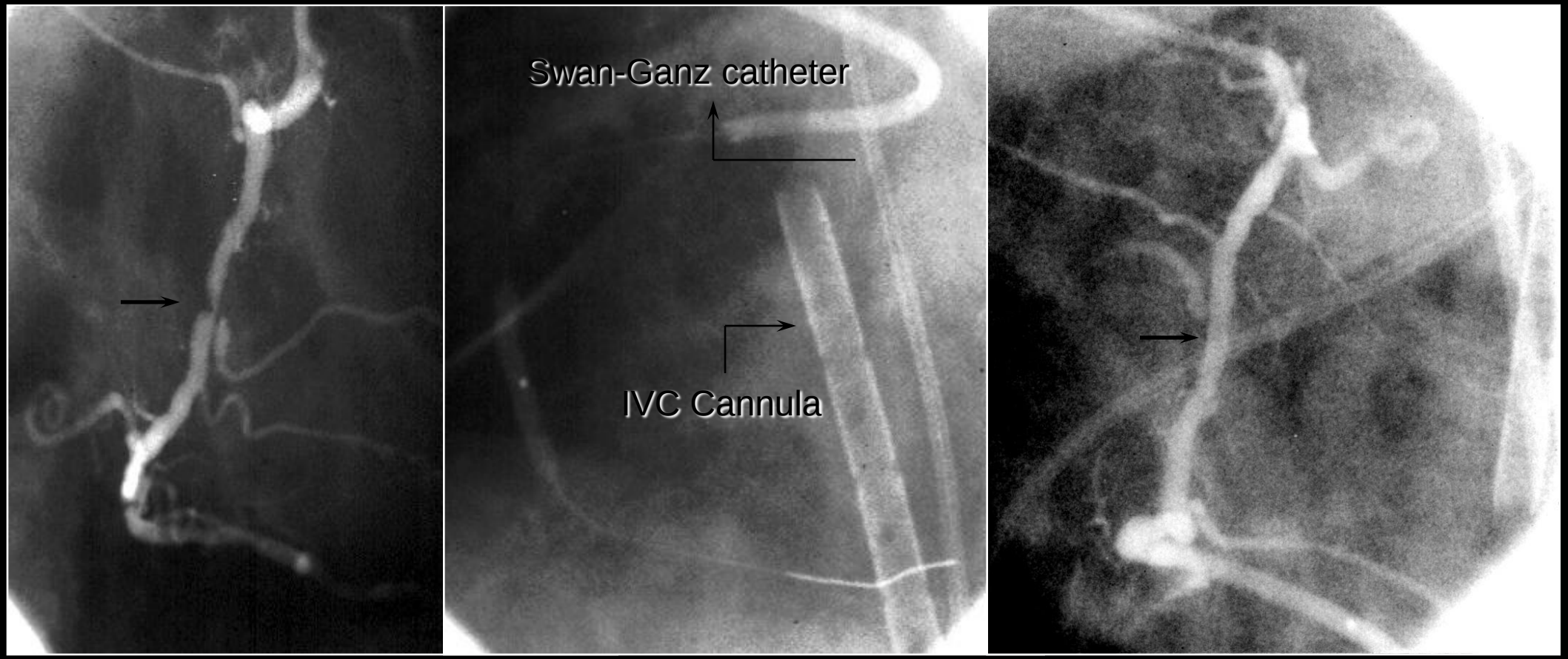
Choi YI M/61 #1898323



# Percutaneous Cardiopulmonary Bypass Supported Coronary Angioplasty ( 1st in Korea)

Choi YI M/61 #1898323
1993년 1월 25일



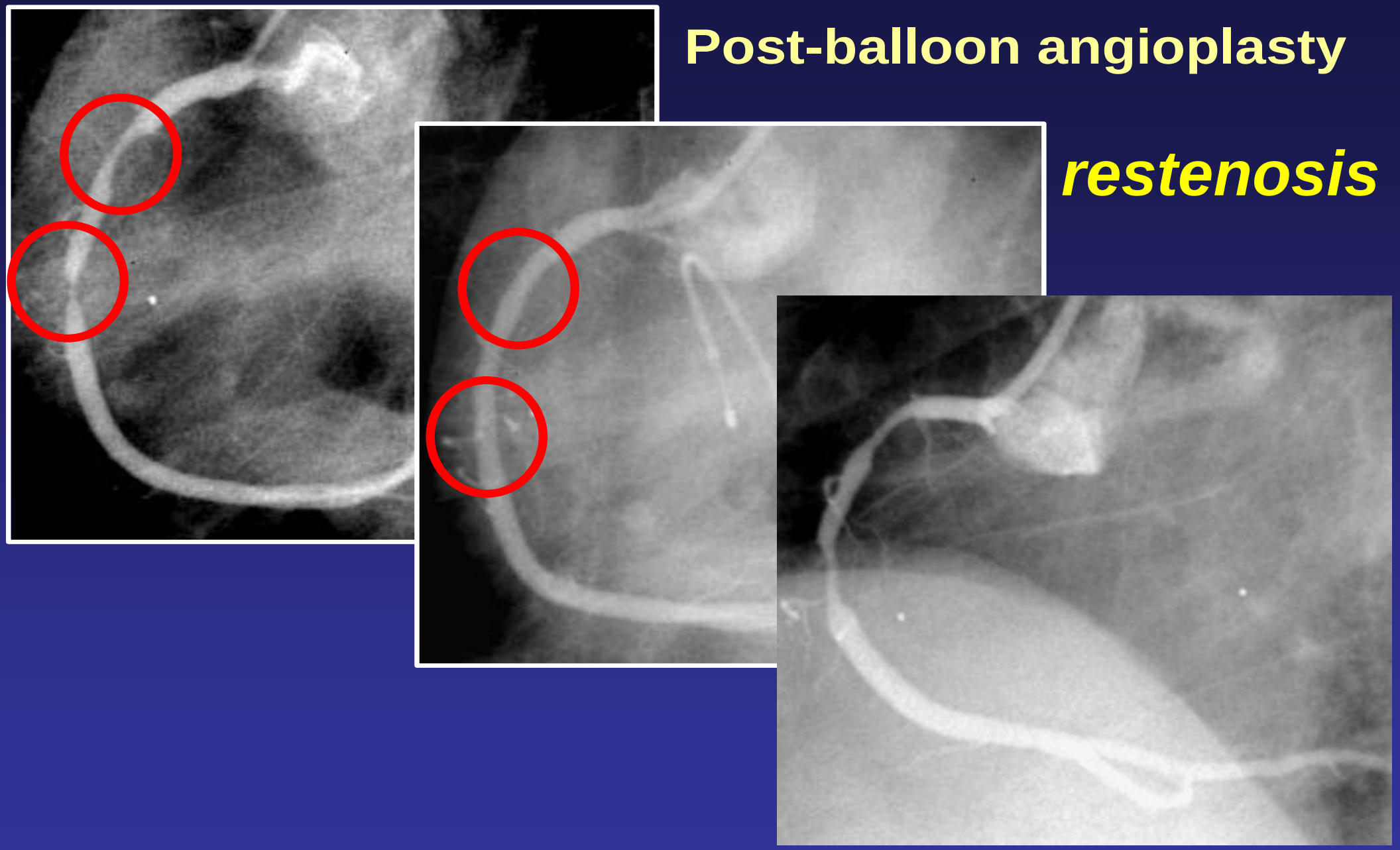

Pre Ballooning Post

# PROBLEMS OF BALLOON ANGIOPLASTY

- ABRUPT VESSEL CLOSURE ( 4 - 8 % )
- RESTENOSIS ( 30 - 50 % )

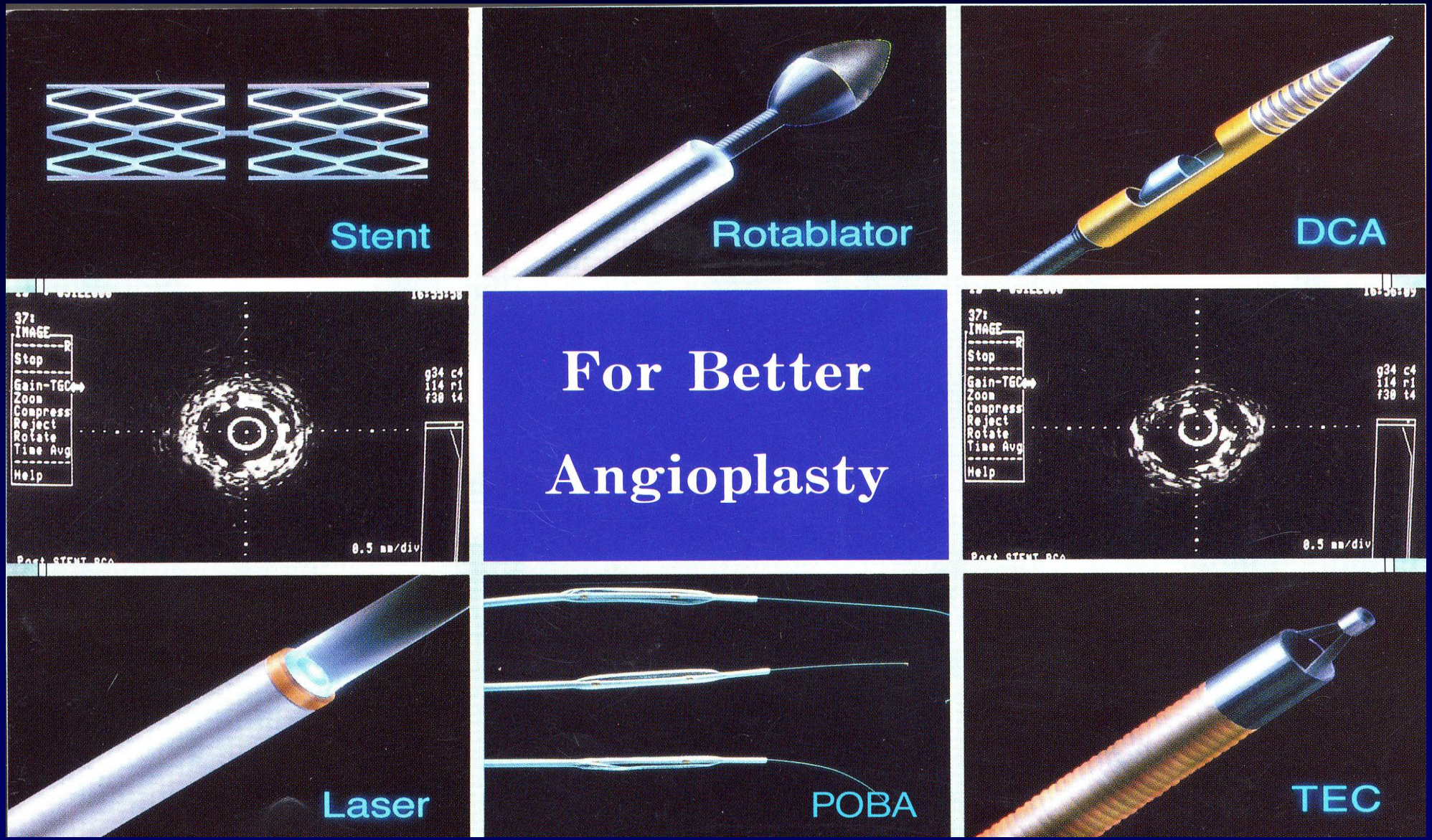
# Success Rate and Incidence(%) of Major Complications of PTCA(Balloon)

| Study | Pts No. | Success | MI | CABG | Death |
|---|---|---|---|---|---|
| NHLBI *(1977-1981)* | 3079 | 61 | 4.9 | 5.8 | 1.2 |
| NHLBI *(1985-1986)* | 2431 | 78 | 4.3 | 3.4 | 1.0 |
| Emory *(1980-1984)* | 3500 | 92 | 2.7 | 1.1 | 0.1 |
| Yonsei *(1983-1991)* | 690 | 86 | 2.6 | 2.7 | 0.4 |

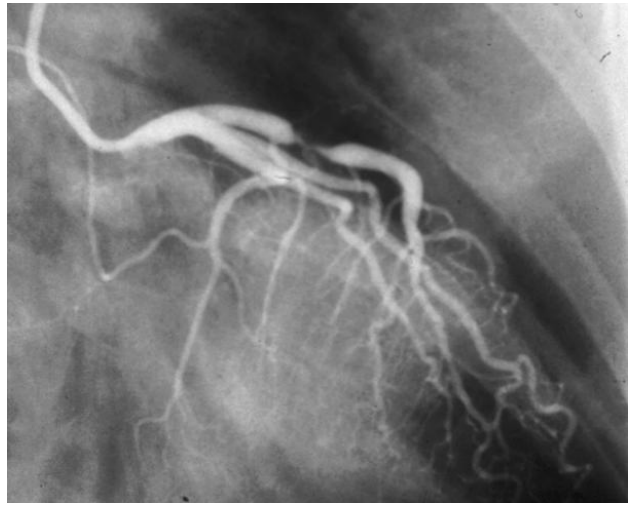


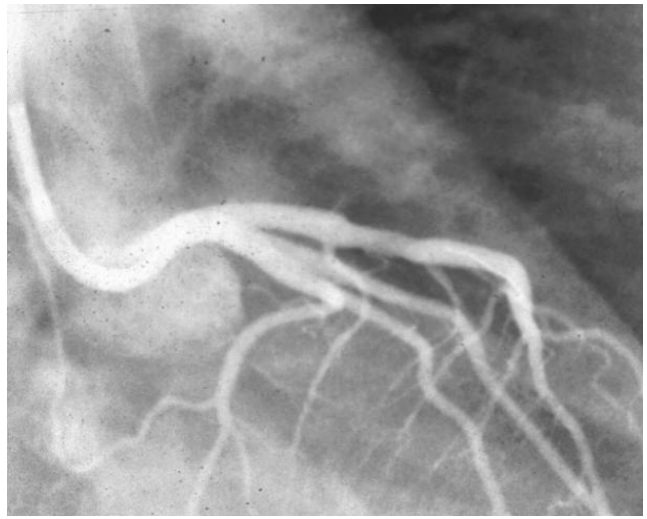
Post-balloon angioplasty

*restenosis*

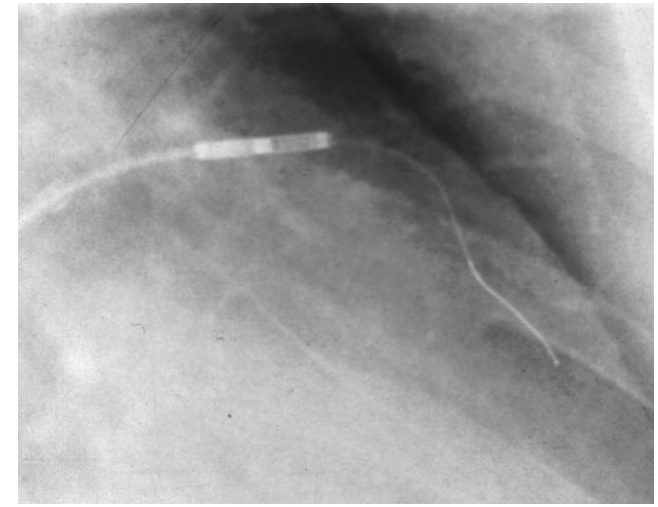

Stent
Rotablator
DCA
37t
IMAGE
Stop
Gain-TGC
Zoom
Compress
Reject
Rotate
Time Avg
Help
g34 c4
i14 r1
f30 t4
0.5 mm/div
For Better
Angioplasty
37t
IMAGE
Stop
Gain-TGC
Zoom
Compress
Reject
Rotate
Time Avg
Help
g34 c4
i14 r1
f30 t4
0.5 mm/div
Laser
POBA
TEC

# Directional Coronary Atherectomy(DCA)　임O순 F 60





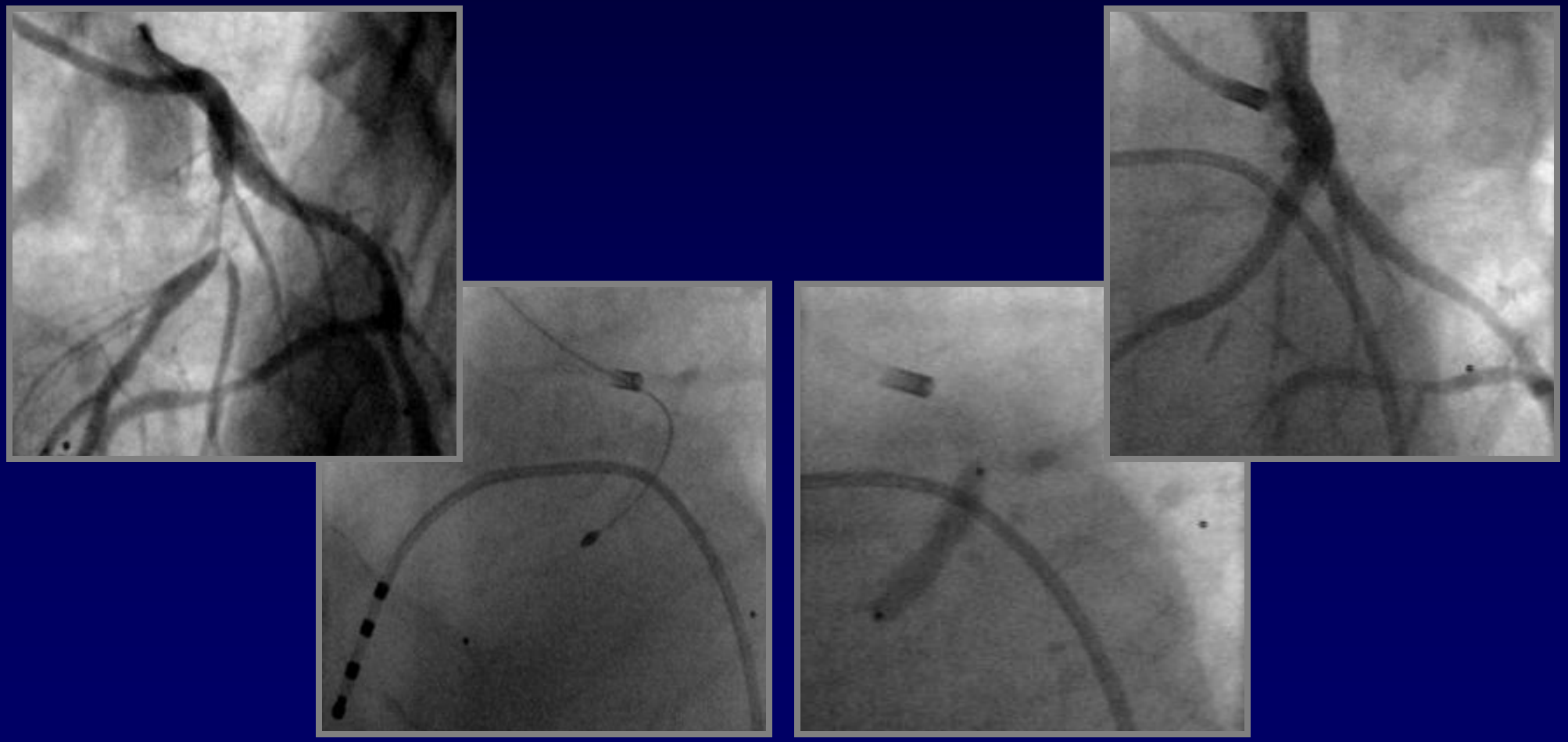
post-DCA(March 17,1994)



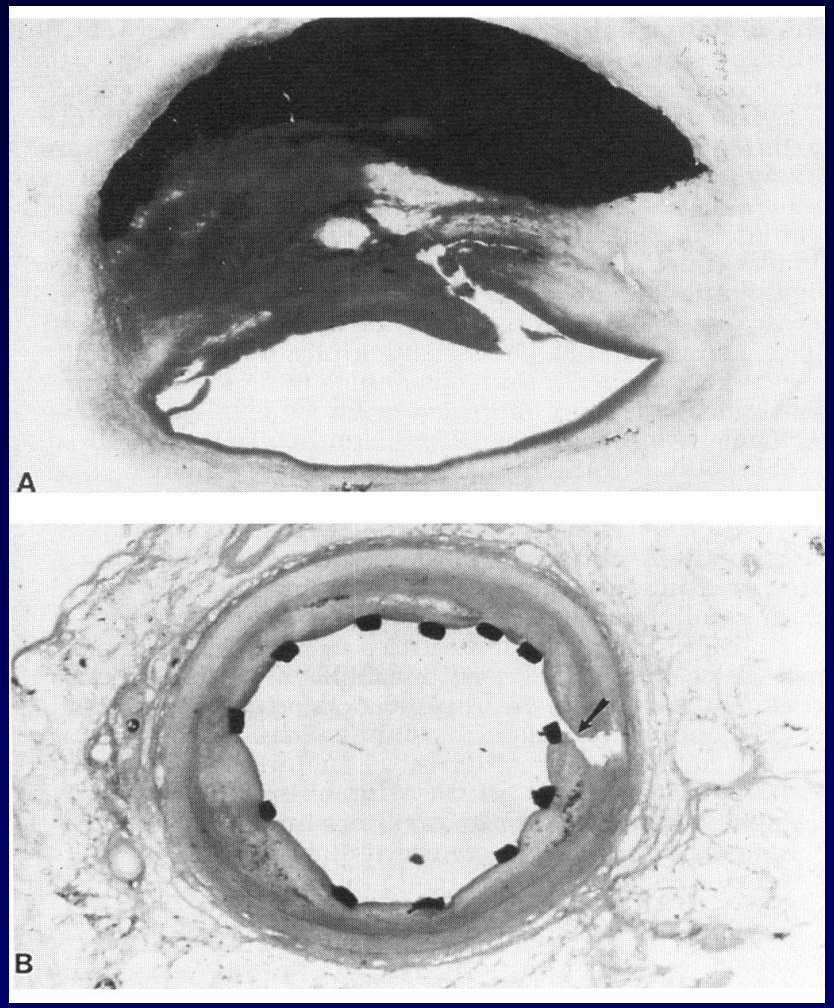
F-U angio (March 28,1995)

# Rotablator with PTCA

정 0 섭, M/56 , 3136231



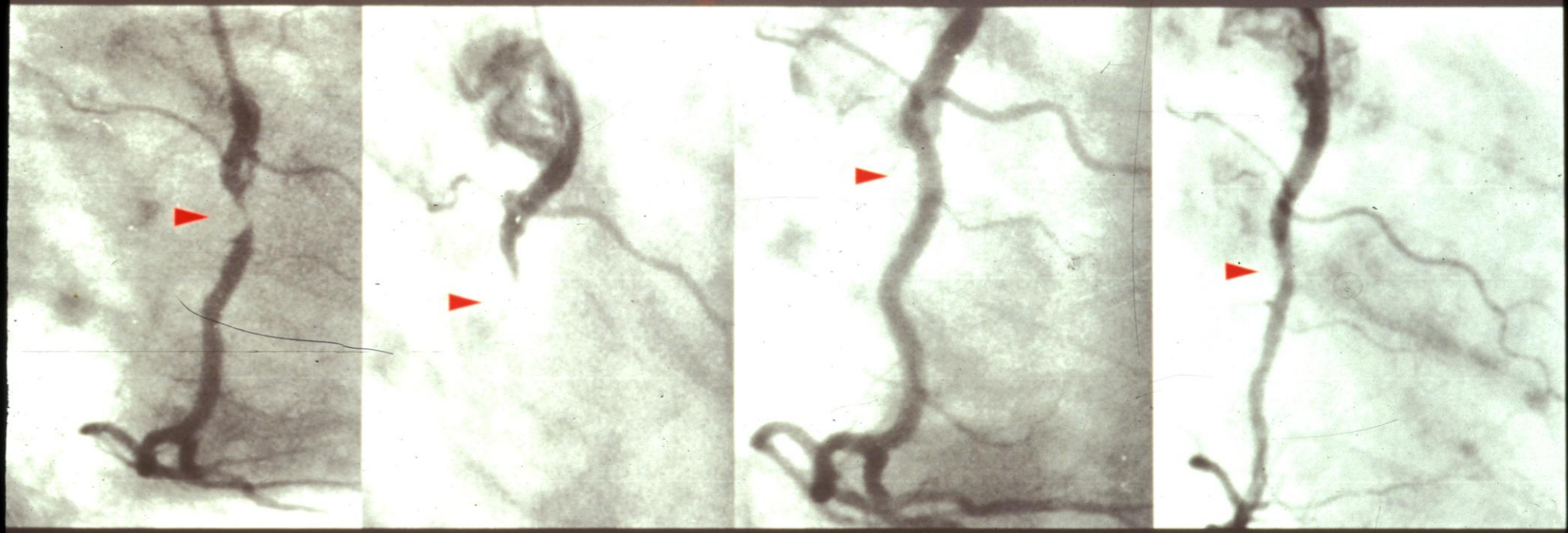
# Role of Stent




- Initially as **“bail out”** treatment after PTCA :
  => management of elastic recoil & dissection

- Randomized trials comparing with PTCA : (STRESS, BENESTENT)
  => *improved procedural success*
  => *Effective in reducing the restenosis rate*

# Angiography of Right Coronary Artery: Flexible Coil(*Gianturco-Roubin*) Stent



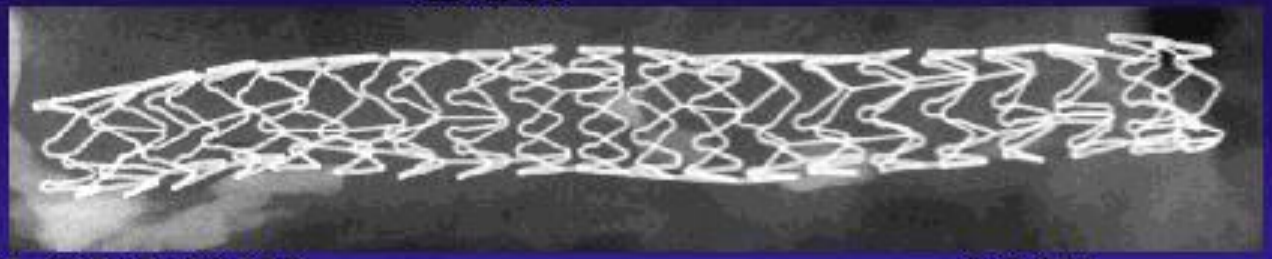
Pre-PTCA | Acute Closure | Post-Stent | 6 months F/U

Yonsei Cardiovascular Center

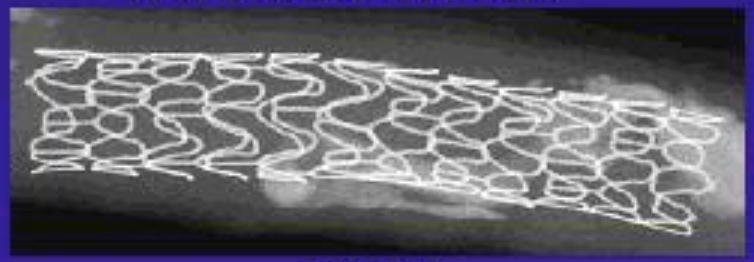
제 1 회 심혈관 중재술 실연회
연세심장혈관센터
1993. 10. 29~30

# Human Stent Evaluation

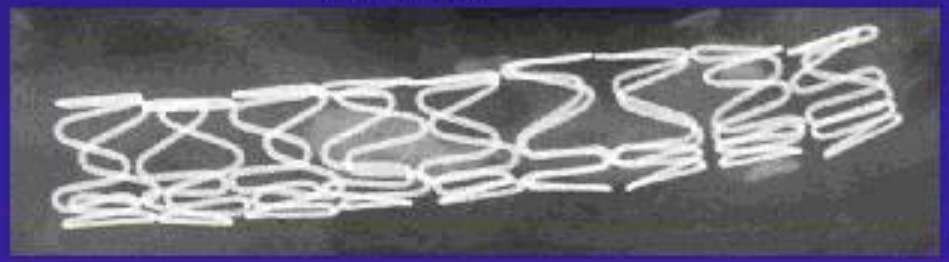
Duet



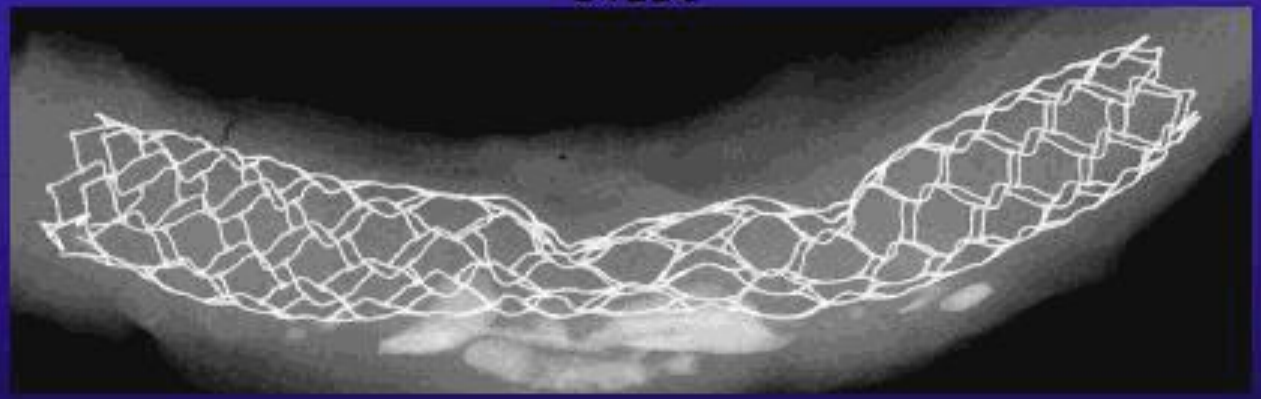
MULTI-LINK



AVE



NIR



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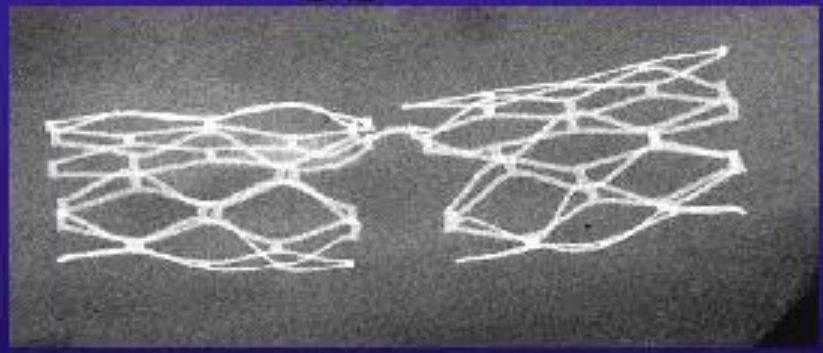
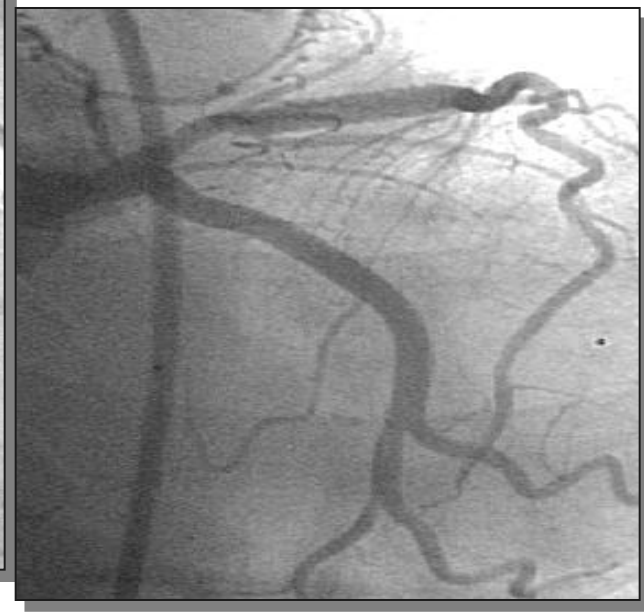


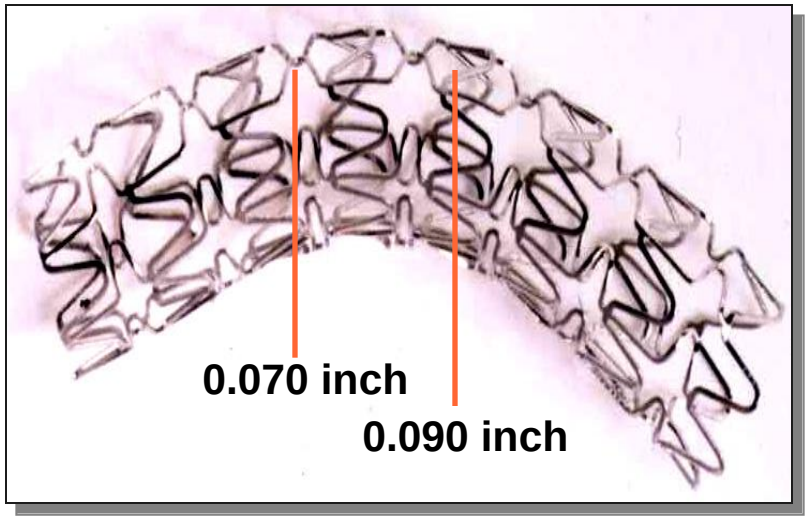
- **AFIP Stent Registry: >200 human coronary stent explants (<24 hours - 4 years)**

PRE



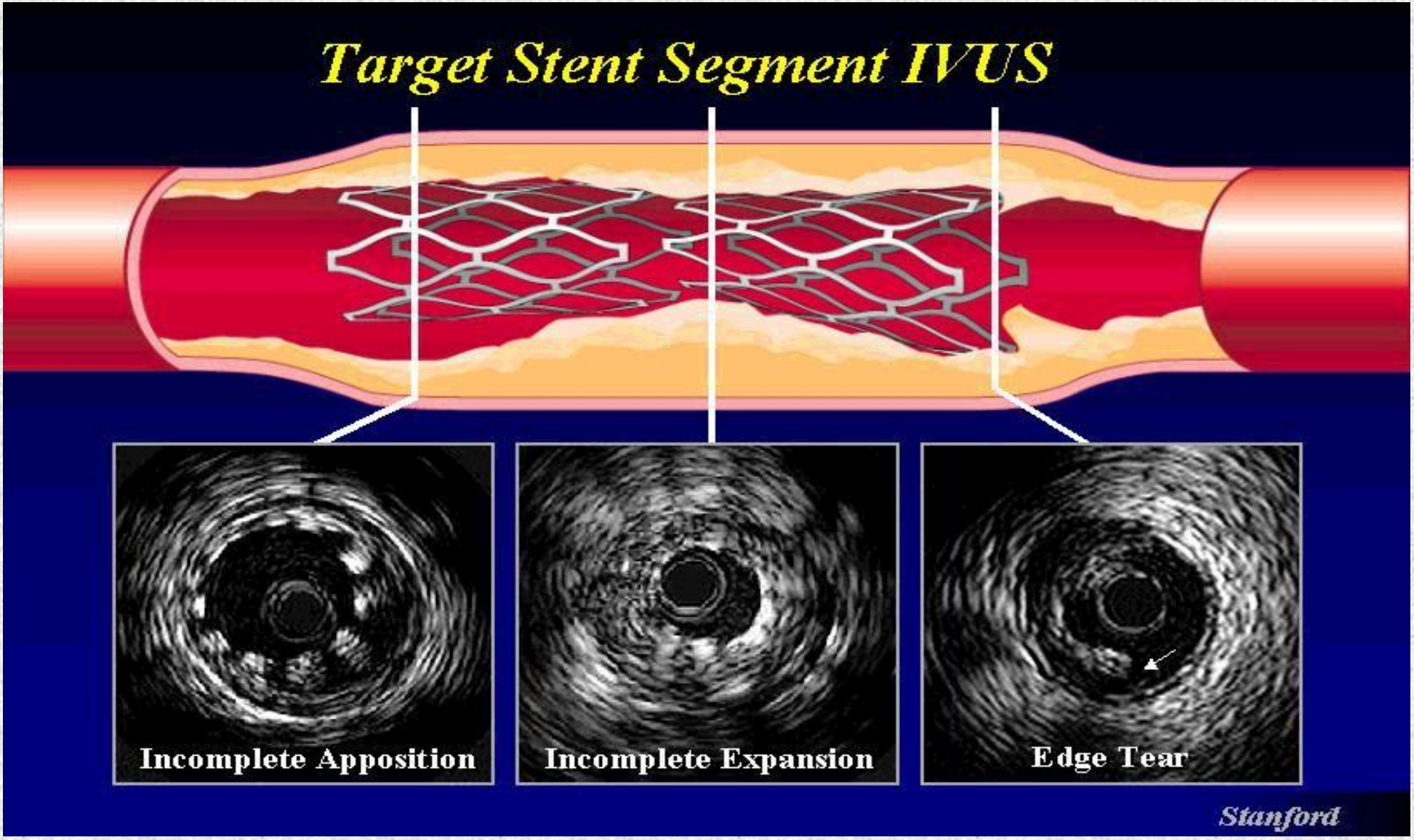
POST

6-mon F/U

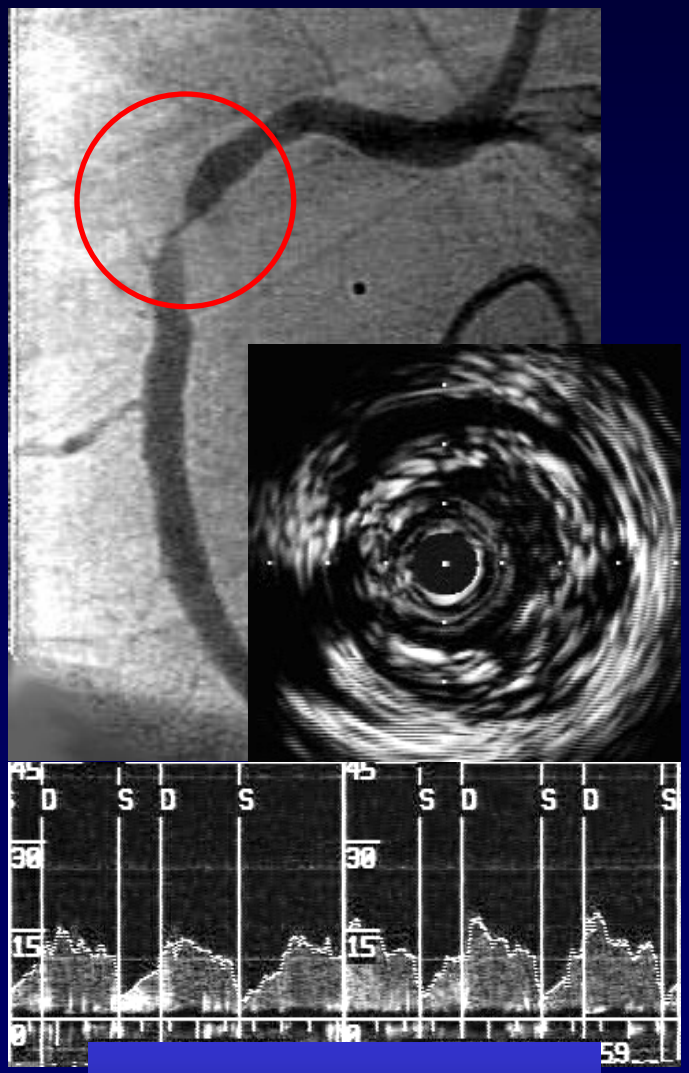



**MAC Stent** 장양수 교수가 개발 **1998년**

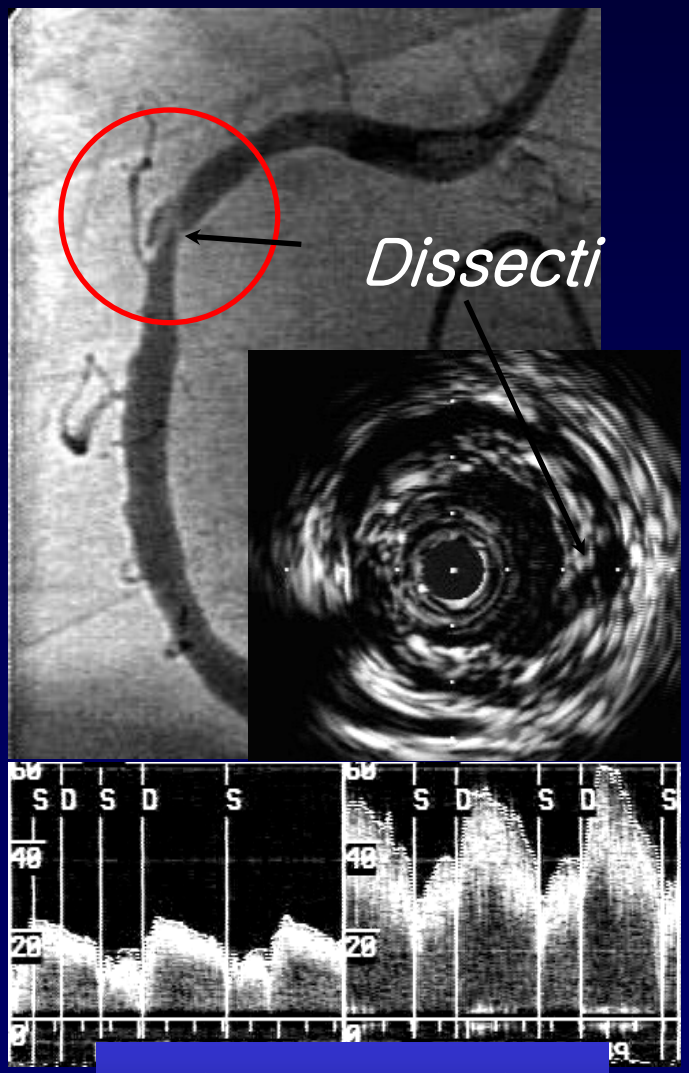
# IVUS GUIDED SENTING



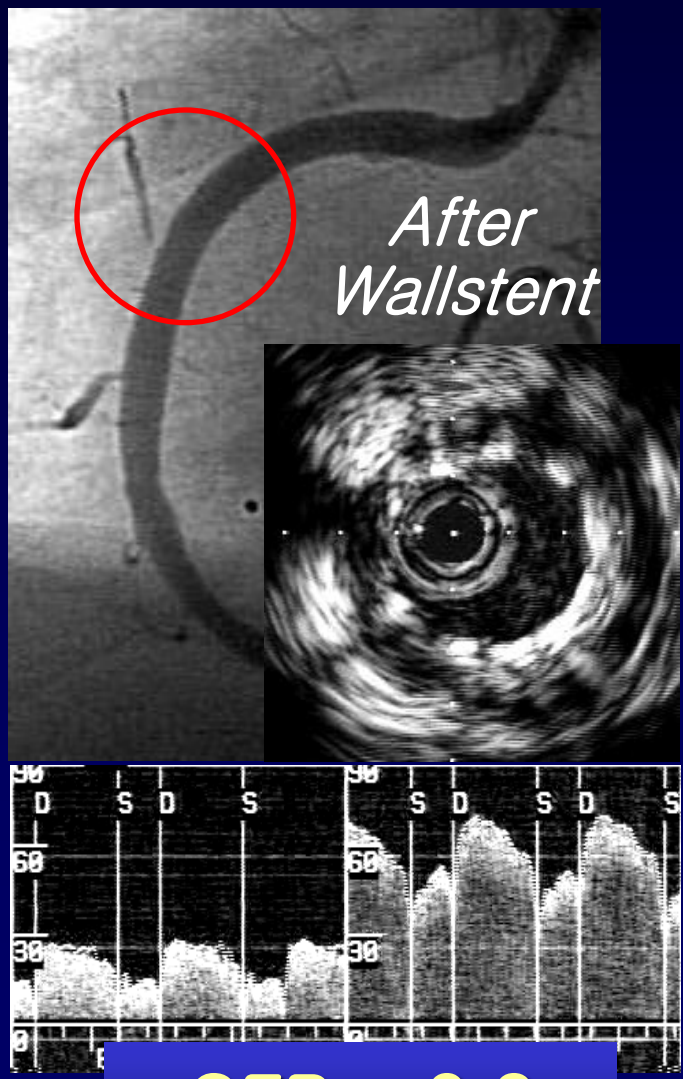
# PROVISIONAL STENTING



CFR = 1.1




CFR = 2.3




CFR = 2.8

# Adjunctive drug therapy during stenting

1. *Aspirin 100-325 mg qd*
2. *Ticlopidine 250 mg bid – fatal neutropenia*
3. *Clopidogrel 75 mg qd*
4. *Glycoprotein IIb/IIIa inhibitors*

# Left Main Thrombosis

Yang KA F 67 3480214

Lt Main thrombosis

Post-stent implantation after reopro infusion

28 month follow-up

# IN-STENT RESTENOSIS RATE

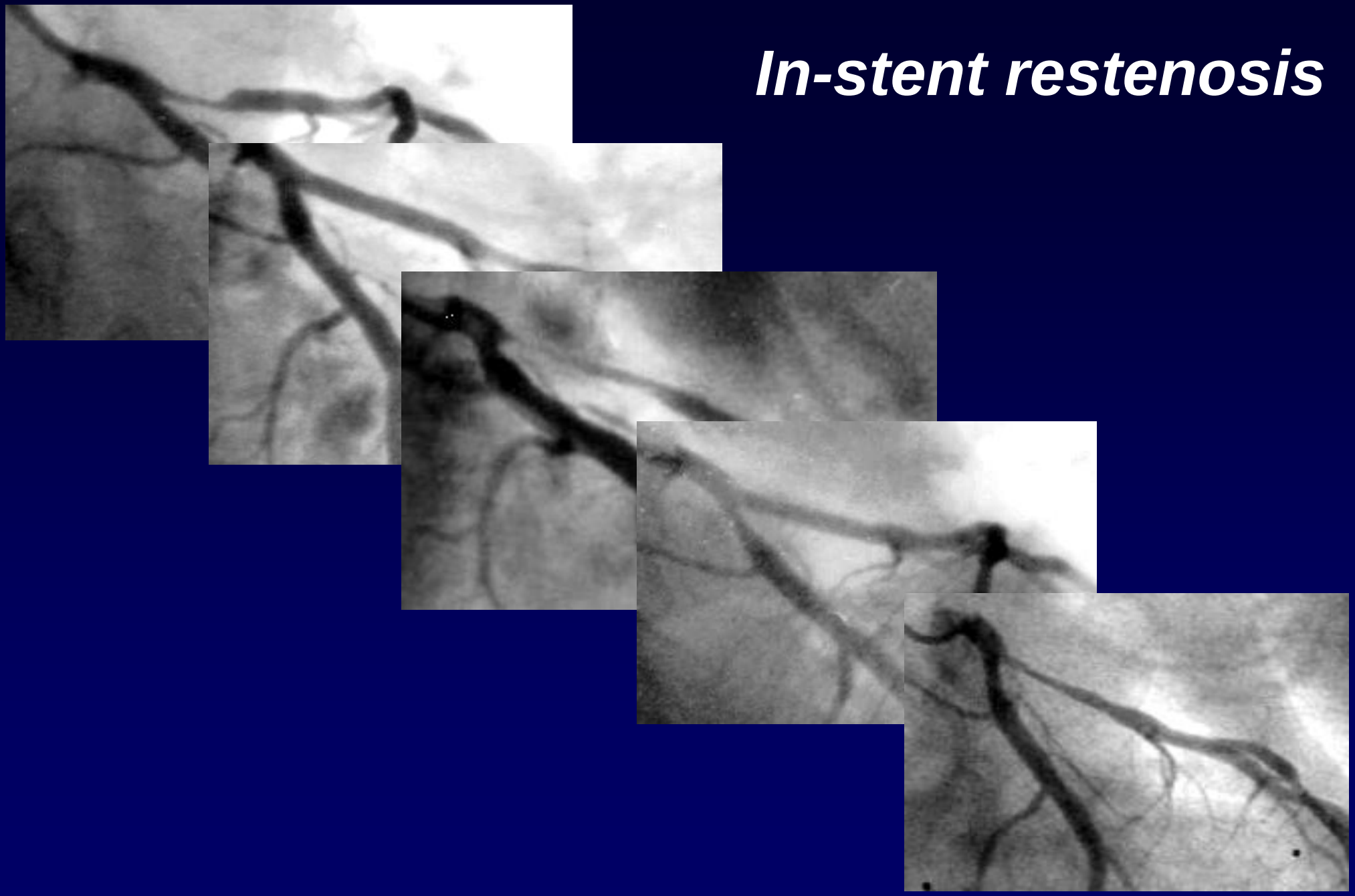
## 10% - 40%

***infuenced by variable factors***

***Stent restenosis can be a real problem! Stent restenosis may not so easy treatable as PTCA restenosis***

***BRACHYTHERAPY***

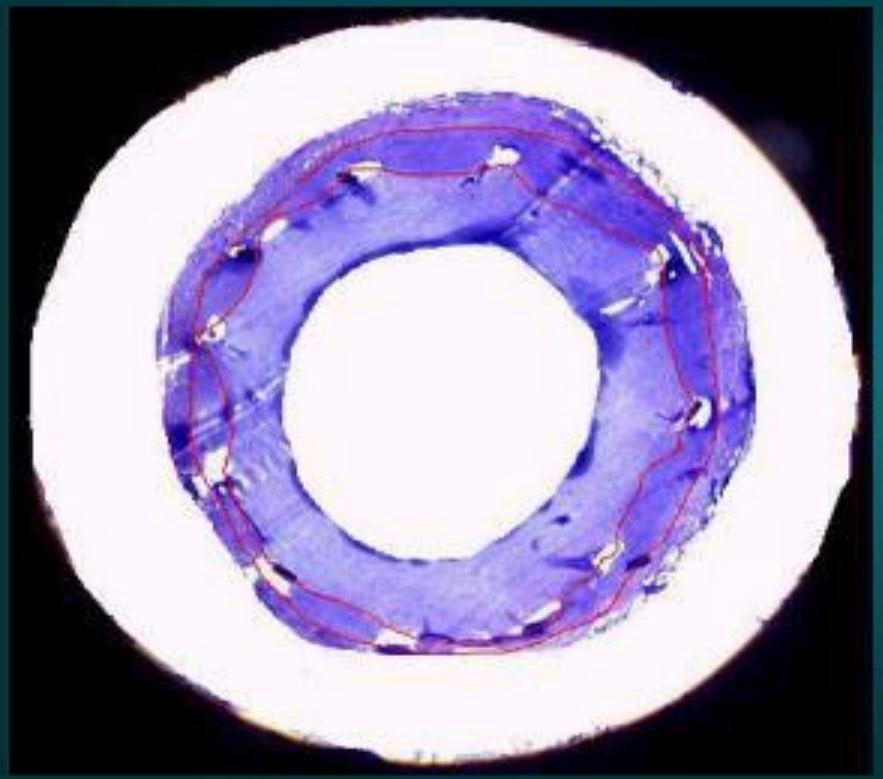
# *In-stent restenosis*



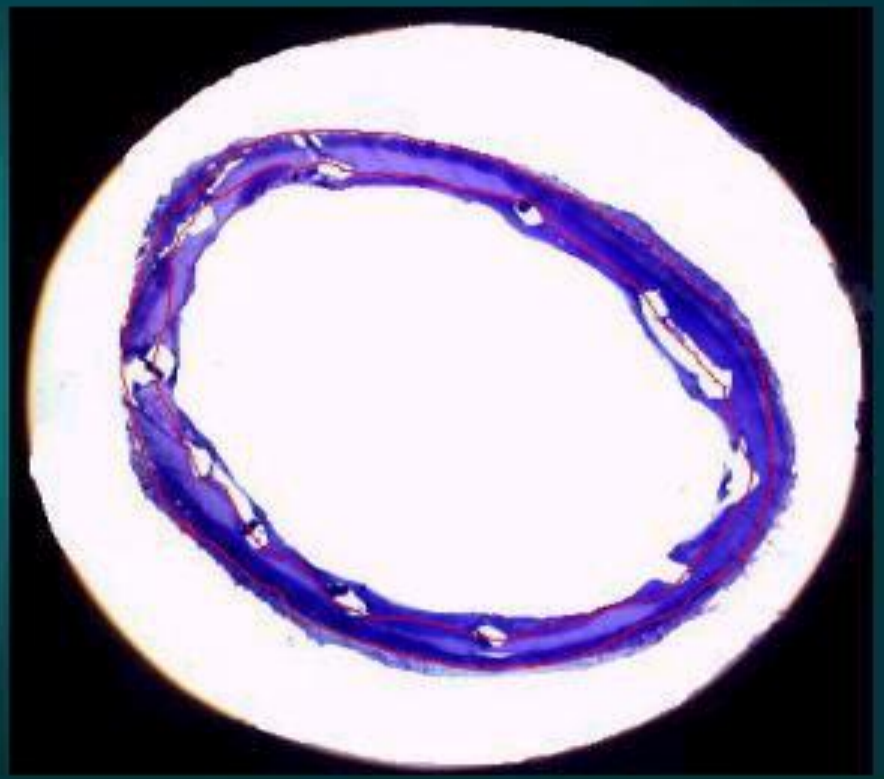
# Rapamycin Stent Coating

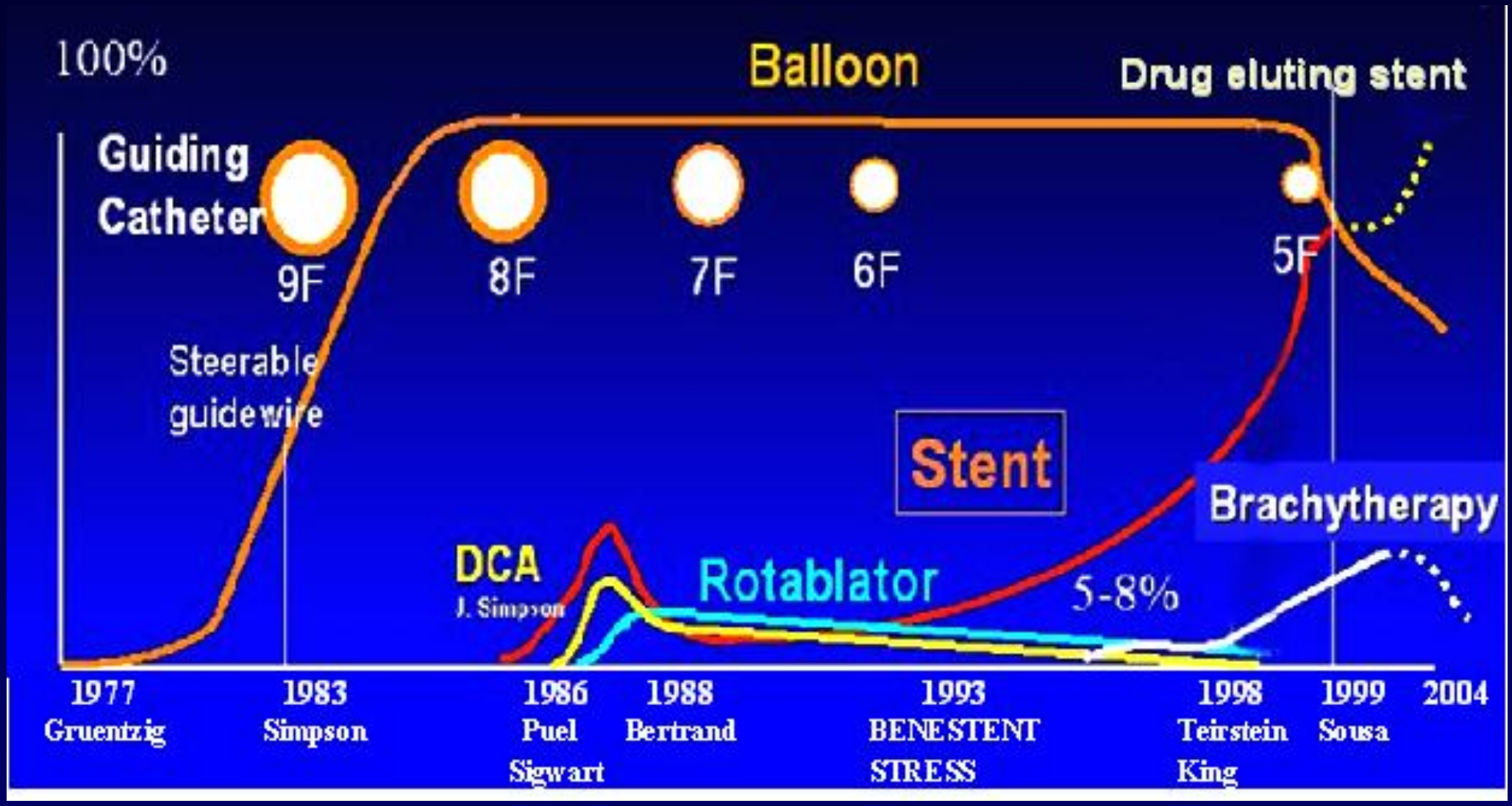
## *14-Day Porcine Coronary*

**Control**



**Rapamycin**




100%
Balloon
Drug eluting stent
Guiding Catheter
9F
8F
7F
6F
5F
Steerable guidewire
Stent
Brachytherapy
DCA
J. Simpson
Rotablator
5-8%
1977
Gruentzig
1983
Simpson
1986
Puel
Sigwart
1988
Bertrand
1993
BENESTENT
STRESS
1998
Teirstein
King
1999
Sousa
2004


2002년도 새심회 총회 및 연수 강좌
일시:2002년 3월 9일 장소:파라다이스호텔 제주

경청해 주셔서 대단히 감사합니다.