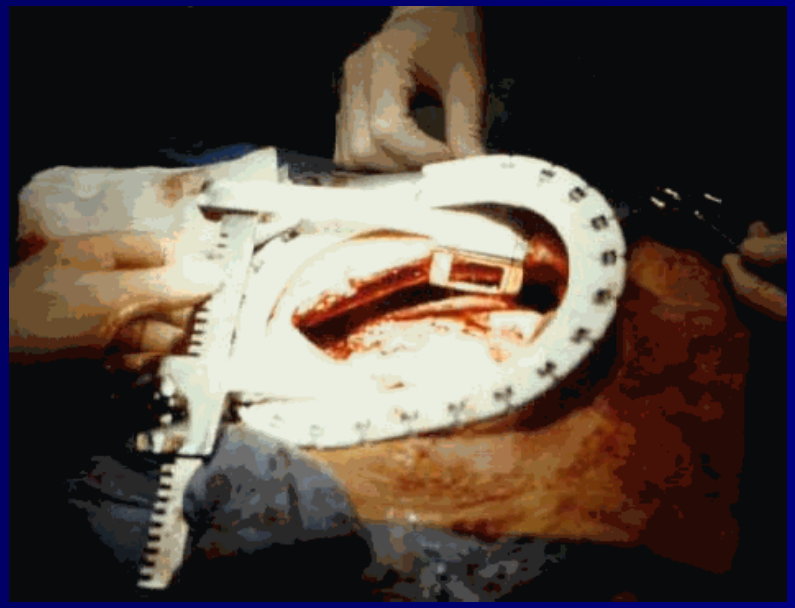
PONTAGE CORONAIRE SOUS VIDEO-CHIRURGIE

MIDCAB

Evolution des techniques opératoires

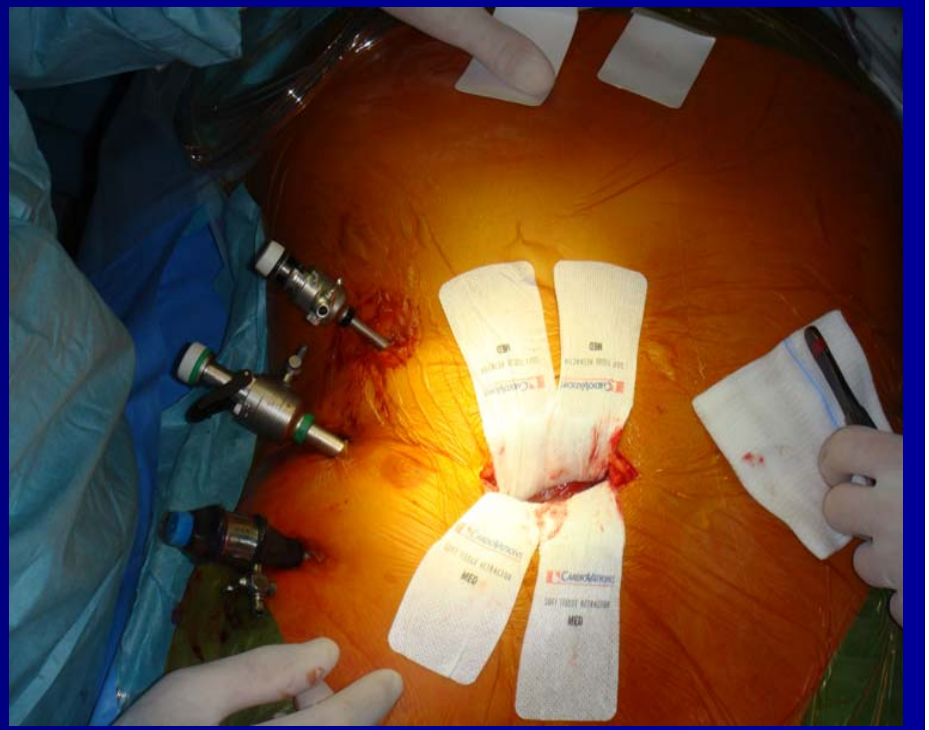
AFISO 2009

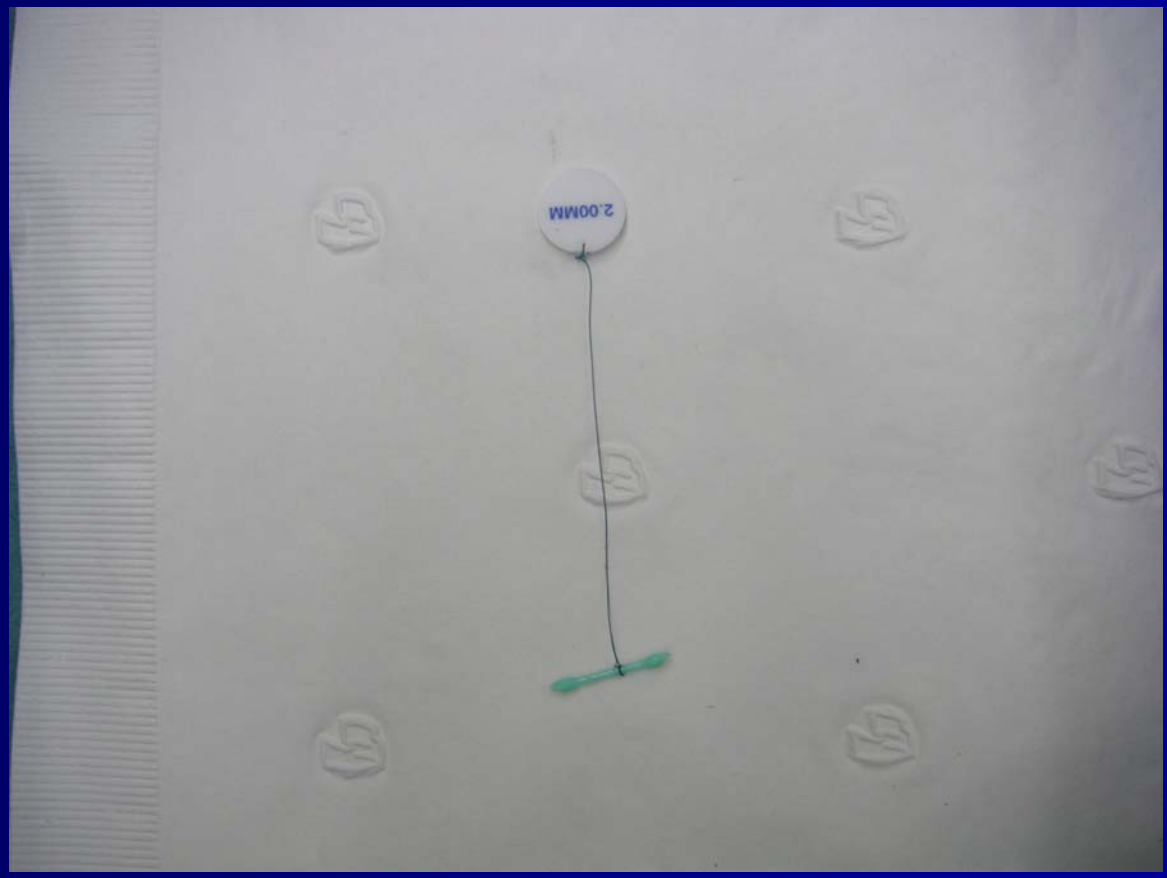
PY Etienne
Clinique St Luc Bouge




Trinitron
OEV203
OLYMPUS
VISERA


CardioMotion
SOFT TISSUE RETRACTOR
MED




2.00MM


8-0 VP-902-X
SURGIPRO II
MV-135-5
TAPER
24" 60 cm

Patients and methods

4/1997 – 5/2009

Complete thoracoscopic harvesting of LIMA without help of robotics
220 patients

Conversion to sternotomy: 7 patients

- 2 pts: bleeding IMA branch
- 2 pts: inability to perform secure anastomosis
- 2 pts: intramyocardic LAD
- 1 pt: severe rythm disturbancies

Selection of patients

- Complete revascularisation: 210 pts

- Hybrid procedures : 10 pts

  Emergency preop RCA PTCA: 6 pts

  Postop RCA or Cx PTCA: 4 pts

Patients

Mean age (y)	62.9 (32-84)
Male	(75%)
HTA	(55%)
Diab	(23%)
Smok	(56%)
Fam	(47%)
Hyperchol	(68%)
Obesity	(21%)

PREOP PTCA	(26%)
Preop INFAR	(16%)
AF	(5%)

Eject fract <30%	5 pts
30-50%	22 pts
>50%	193 pts

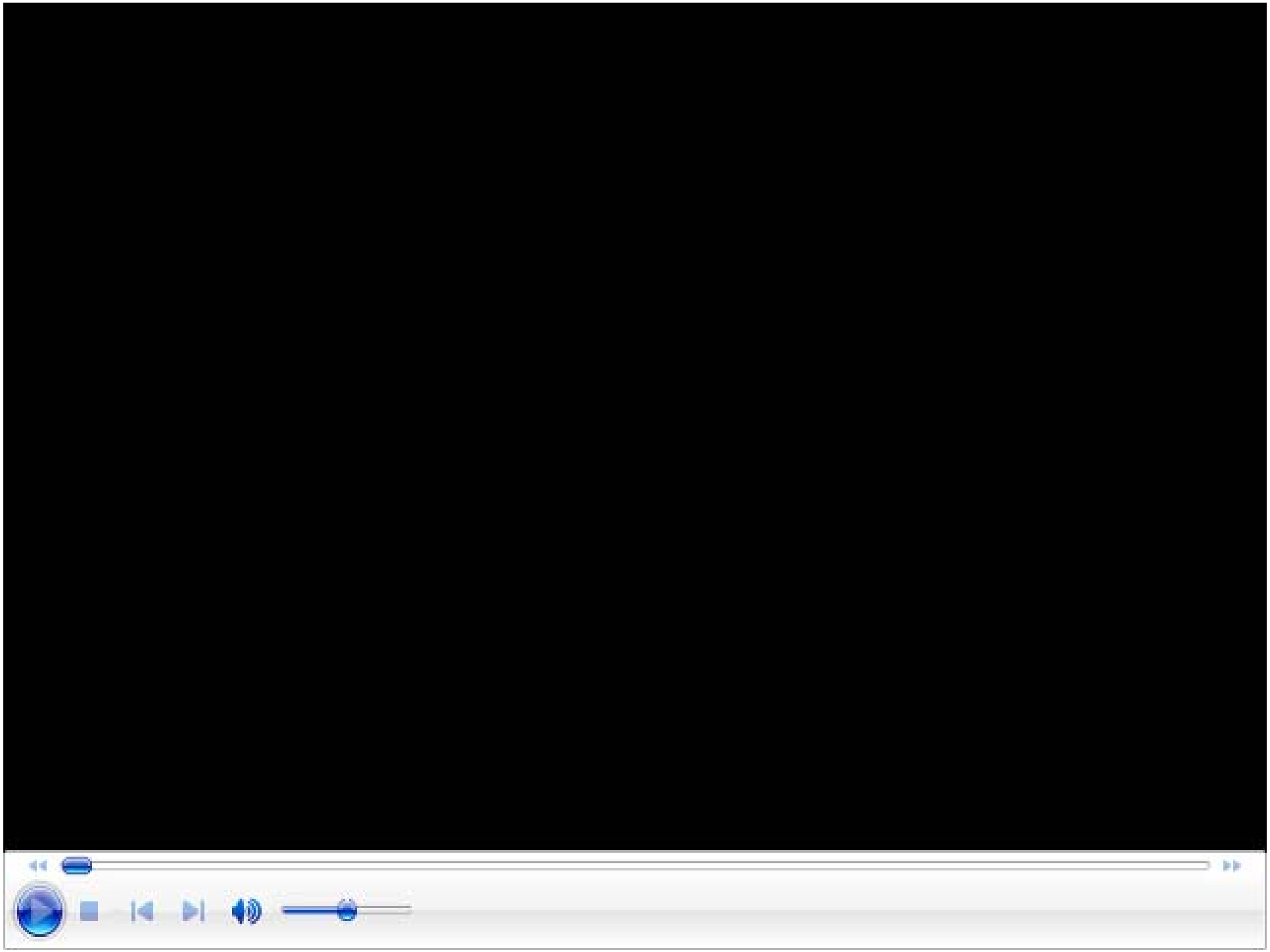
EUROSCORE

MEAN EUROSCORE	**3.3** (0-11)
FEMALE	25%
UNST ANG	18%
VASC	22%
COPD	6%
ATCD CABG	1 pt
RECENT INF LAD 9.7% RCA PTCA 5.6%	14%
CREAT>2	1.3%
PREOP CRIT CARE FV, ext massage	0.6%

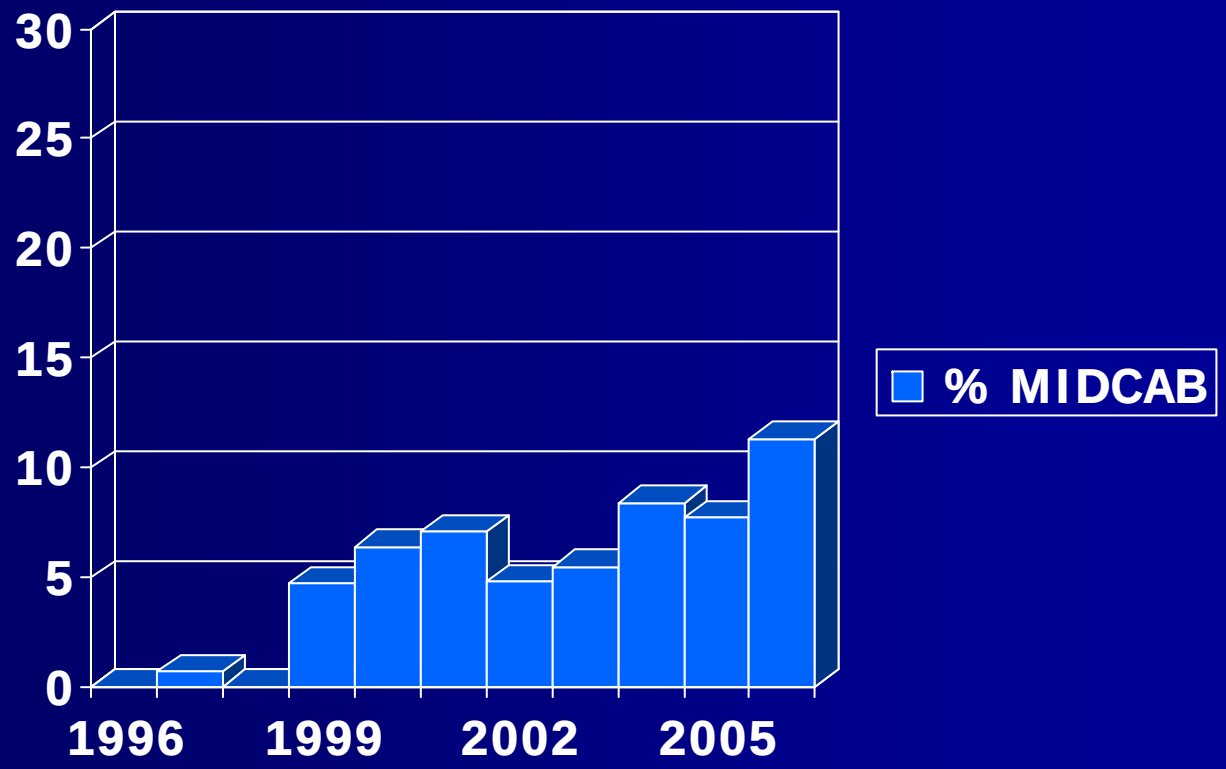
Indications

Isolated LAD disease: 195 pts

Ostial LAD stenosis:	30%
Occluded LAD:	15%
Complex LAD lesions:	15%
Bifurcation diag – LAD	40%
In stent restenosis	15%



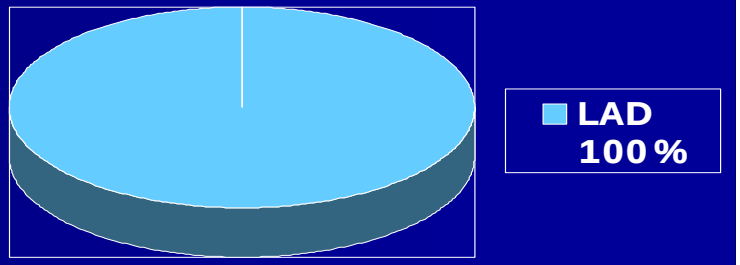
EVOLUTION OF MIDCAB %



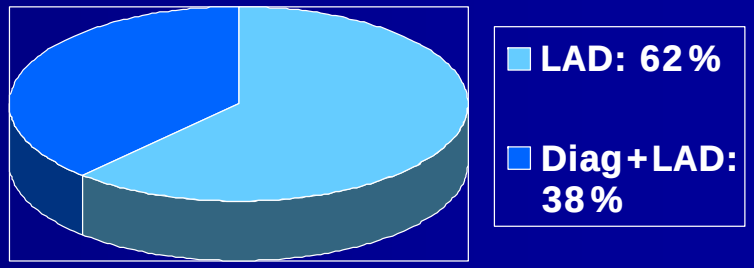
Evolution of the technique

Extension of revascularisation

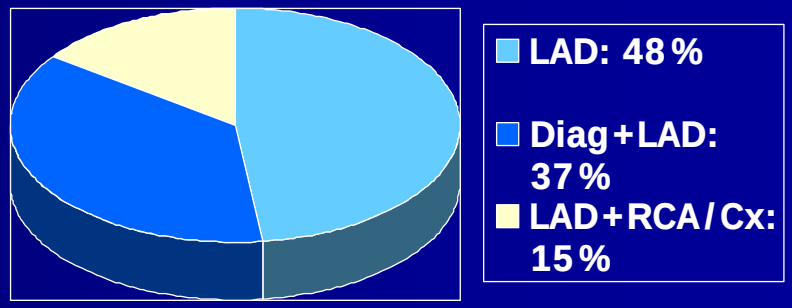
4/1997 – 2/2000



3/2000 – 3/2001



4/2001 – 5/2009



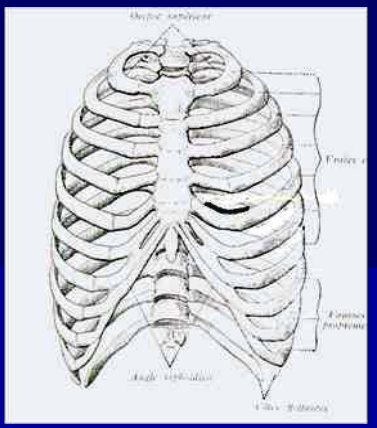
Evolution of the Technique

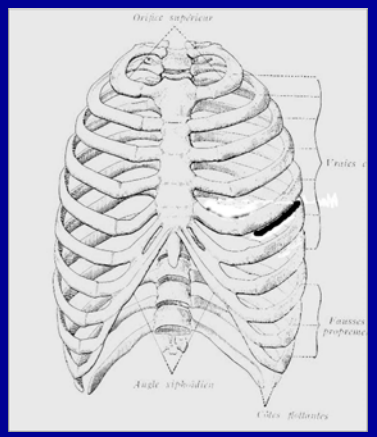
LAD: 4 cm ant minithoracotomy

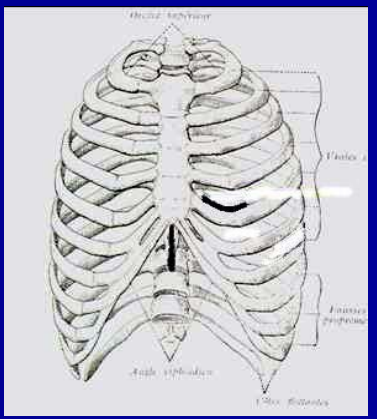
+ Diag: 4→6 cm minithoracotomy

LAD+ Cx: + 6 cm 6th intercostal space

LAD+RCA: + 6 cm xyphoid incision



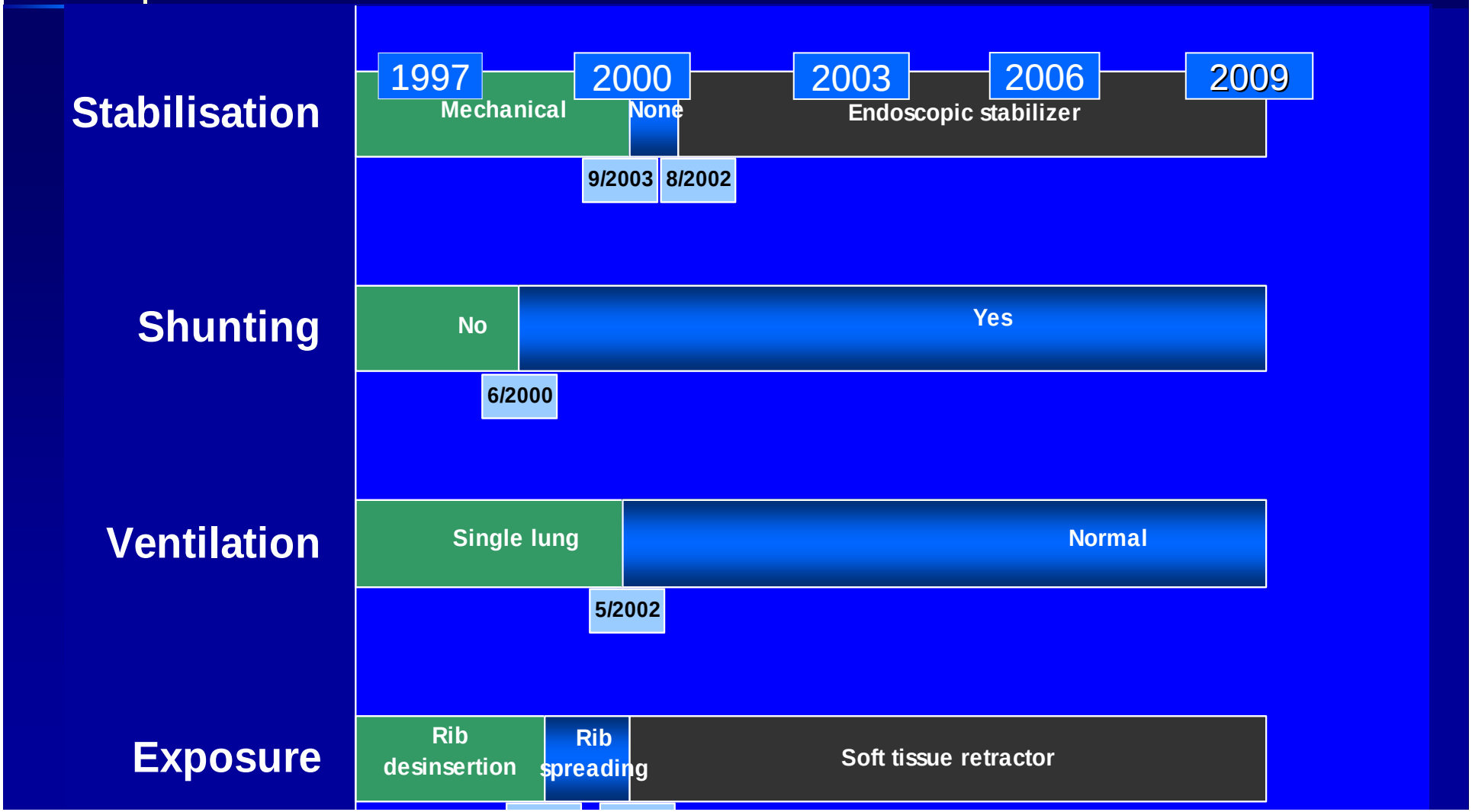




Evolution of the technique

- Minithoracotomy
  - 1: sternocostal articulation division
    + mechanical retraction
  - 2: mechanical retraction
  - 3: soft tissue retraction
- Ventilation
  - 1: single lung
  - 2: normal
- Stabilisation
  - 1: mecanical
  - 2: pericardial stiches
  - 3: suction devices
- Myocardial protection
  - 1: no shunt
  - 2: systematic shunting

Evolution of the technique



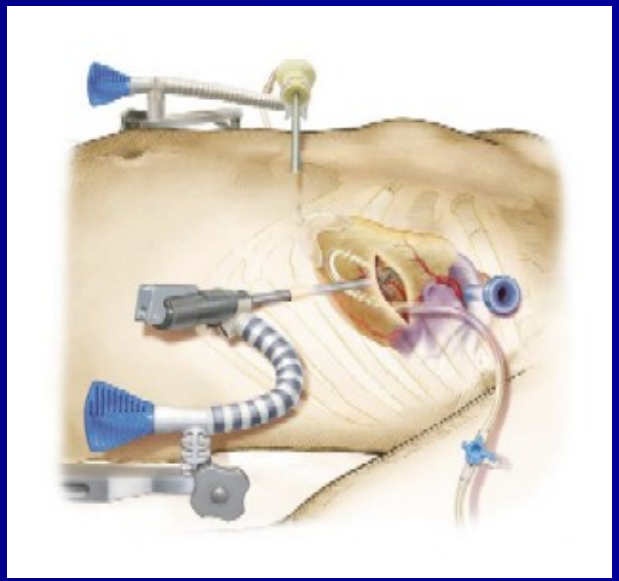
Technique

Stabilization

- Pericardial stiches

- Mecanichal stabilizer
- Estech
- Guidant Access

- Octopus NS
- Endostarfish



Results

Nb anastomoses: 231 (1.5/pt)

– LIMA - LAD:	95 pts	
– LIMA - Diag-LAD:	55 pts	
– LIMA – Cx:	3 pts	
– LIMA Y – Diag	1 pt	154 PTS
– RIMA – LAD	4 pts	
– RIMA Y – Cx	1 pt	
– RIMA Y – Cx1 – Cx2	1 pt	6 PTS
– RGEA – RCA or PDA	10 pts	10 PTS
– Rad Y-Diag:	1 pt	
– Rad Y – Cx	4 pts	5 PTS

Complications

Hospital mortality: 1 pt

- Intestinal ischemia - low cardiac output J4
  80y, preop FE 30%, Creat>2, no viability Cx/RCA
  Additive euroscore 11, logistic euroscore 27,14

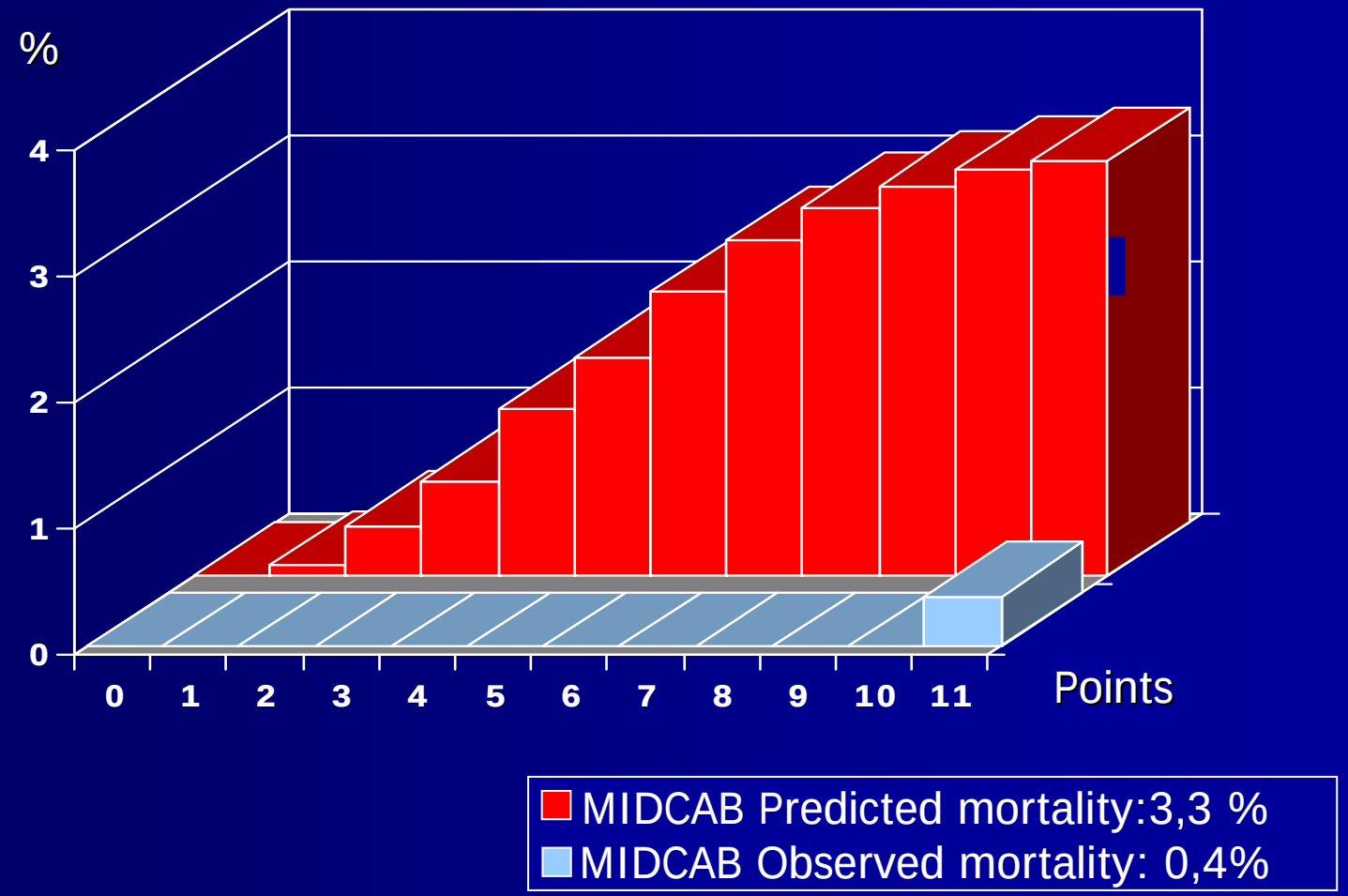
Early reoperation: 3 pts

- kinking sequential graft diag-LAD
  → Minithorac, LIMA-IVA
- thrombosis RCA (30% stenosis, non grafted)
  → Sternotomy, Gs-PDA
- hemostasis (bleeding anastomosis)
  → Sternotomy

Infarction

- 1 spasm radial graft on Cx
- 1 kinking LIMA on diag

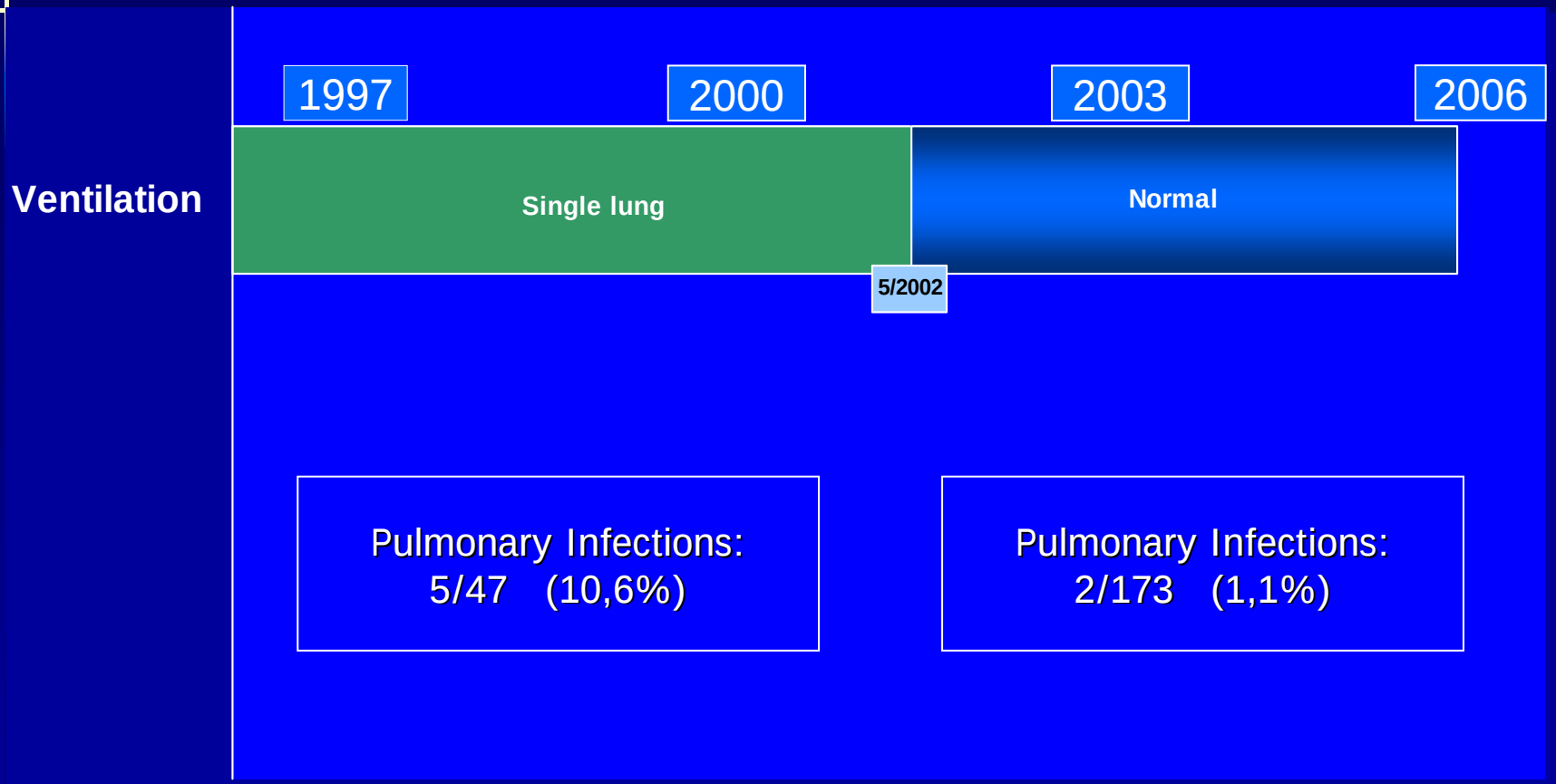
Euroscore predicted mortality



Complications

- TIA : 2 pts
  (AF D7, visual; AF D14: cerebellar)
- Pulmonary infection: 8 pts
- Atrial fibrillation: 18.2%
- Muscular hematoma: 2 pts

Evolution of the technique



Follow up

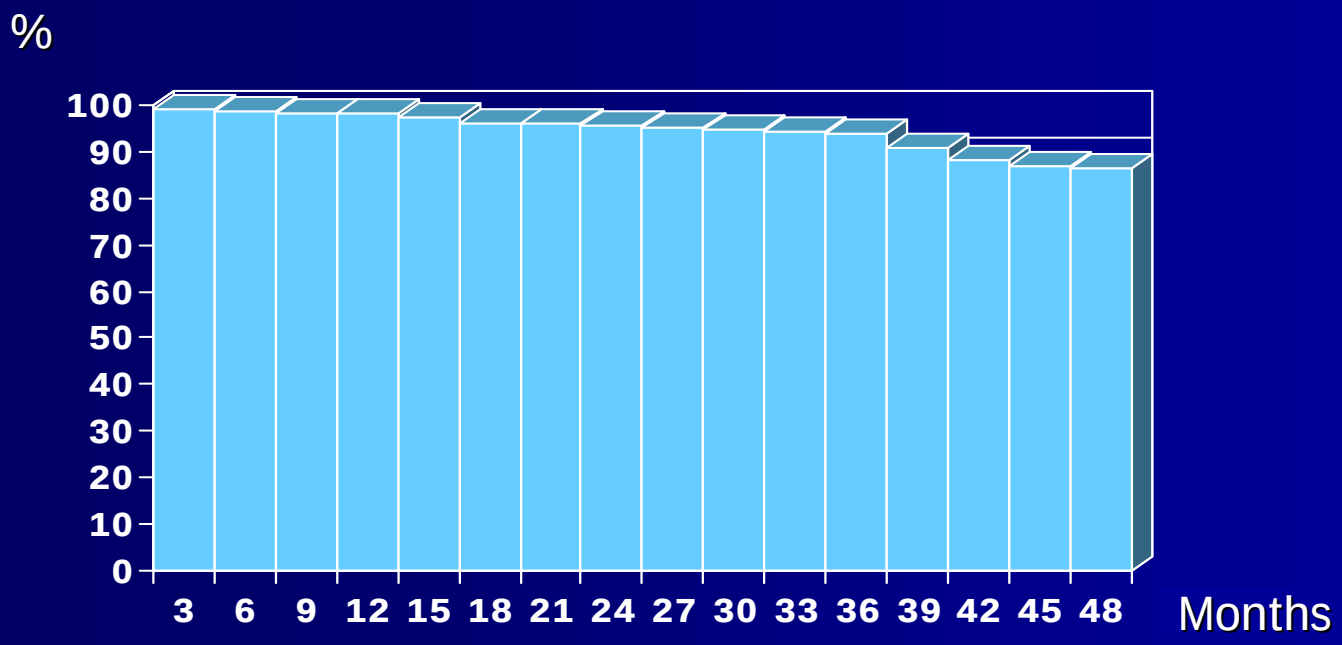
- Mean: 30 months (3-112)

  99.4% complete

- Late deaths: 10 pts

3 months: sudden death	(77y)
14 months: pancreatic cancer	(89y)
17 months: pulm oedema (preop EF 25%)	(70y)
38 months: angiocholitis	(83y)
38 months: renal insuficiency	(78y)
41 months: cachexy	(82y)
50 months: suicide	(68y)
55 months: plasmocytoma	(76y)
55 months: cachexy	(85y)
57 months: ischaemic colitis	(84y)

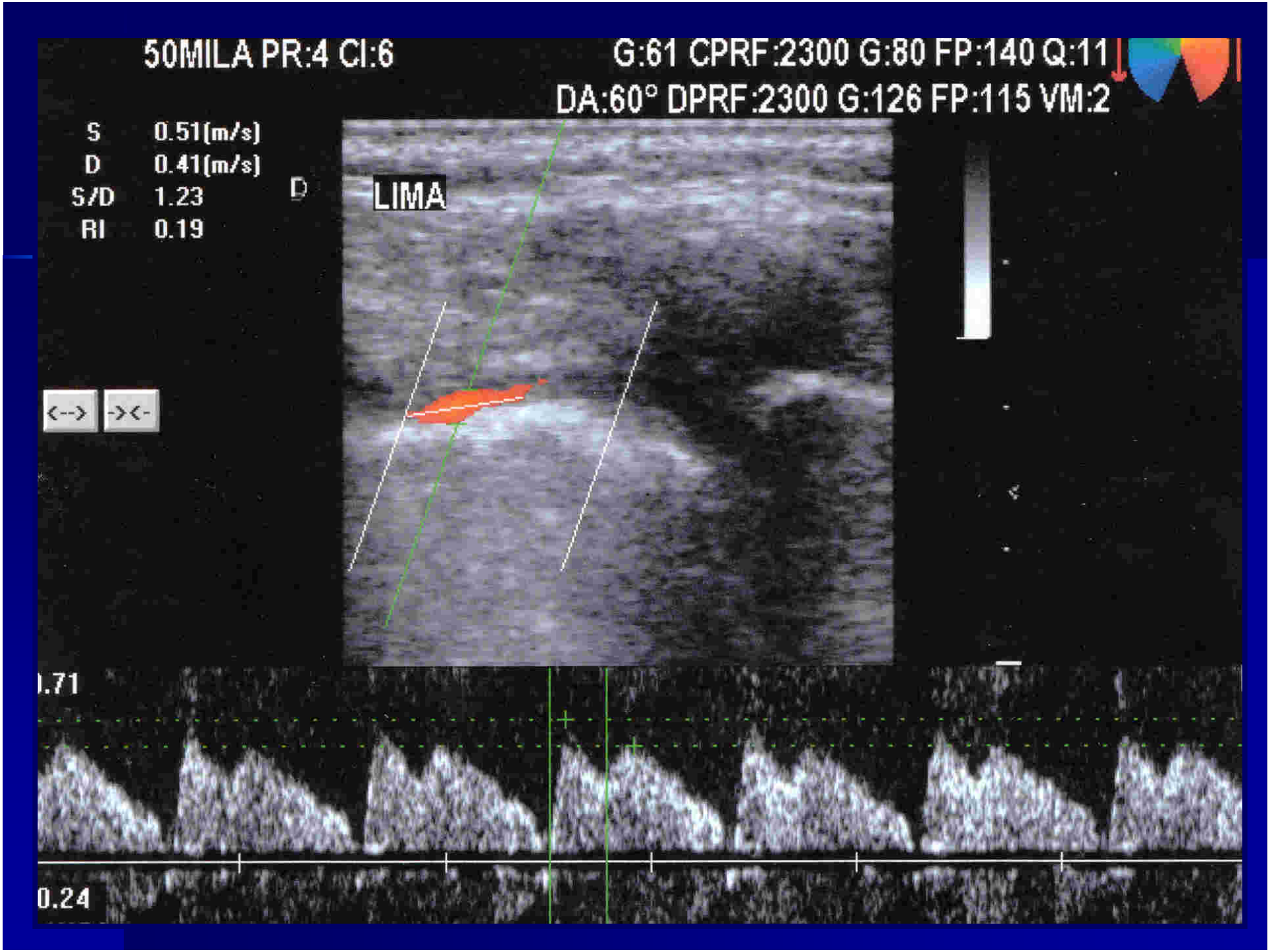
Survival



	1 year	2 years	3 years
MIDCAB	98.5%	95.8%	94.2%

Follow up

- Epreuves effort 84 %
- Echo-doppler mammaire 90 %
- Angiographie 92 %


50MILA PR:4 CI:6
G:61 CPRF:2300 G:80 FP:140 Q:11
DA:60° DPRF:2300 G:126 FP:115 VM:2
S 0.51(m/s)
D 0.41(m/s)
S/D 1.23
RI 0.19
D
LIMA
<-->
->
.71
0.24

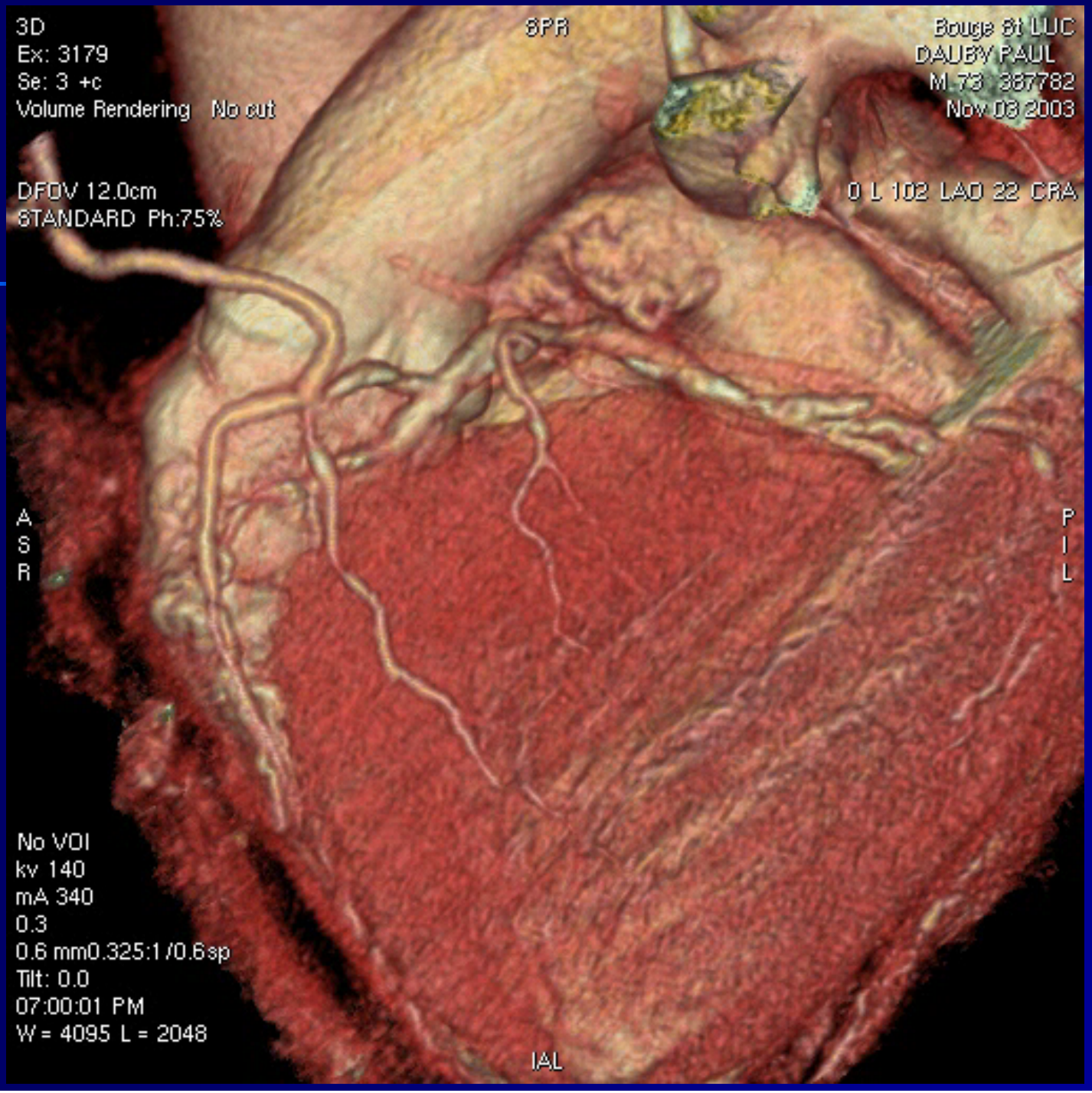
MIDCAB: LIMA patency

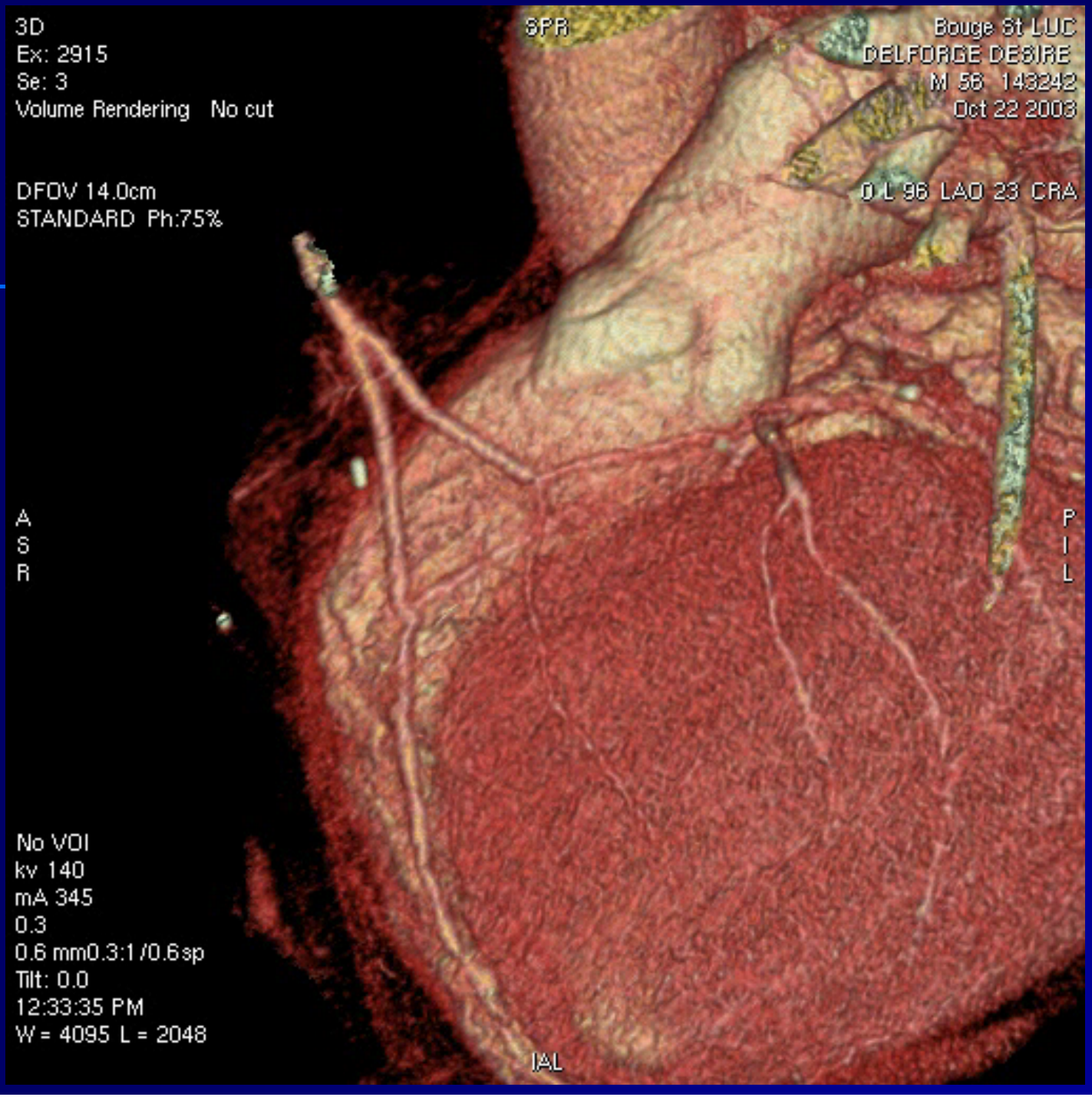
Angiography: (92%)

- Mean delay: 14.5 months
- Conventional coronarography: 27%
- Angio scanner: 73%

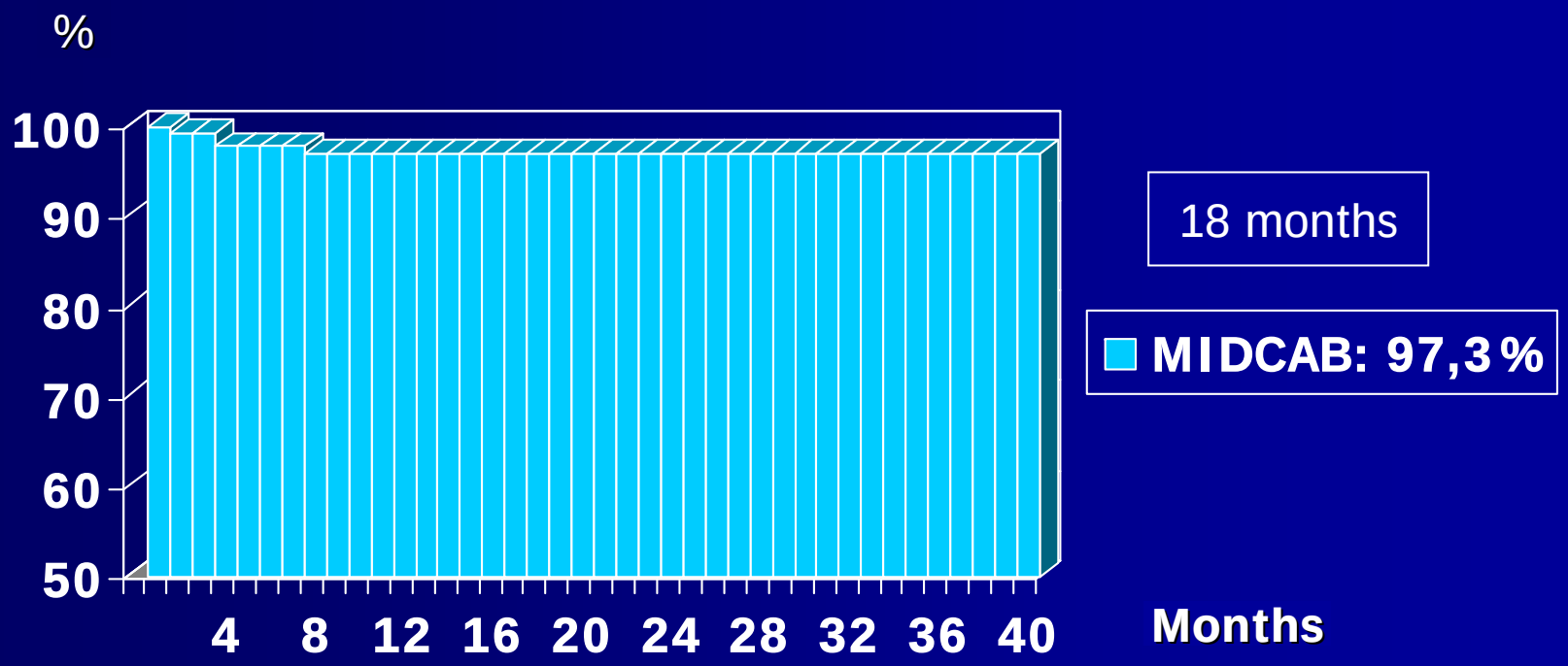
Results:

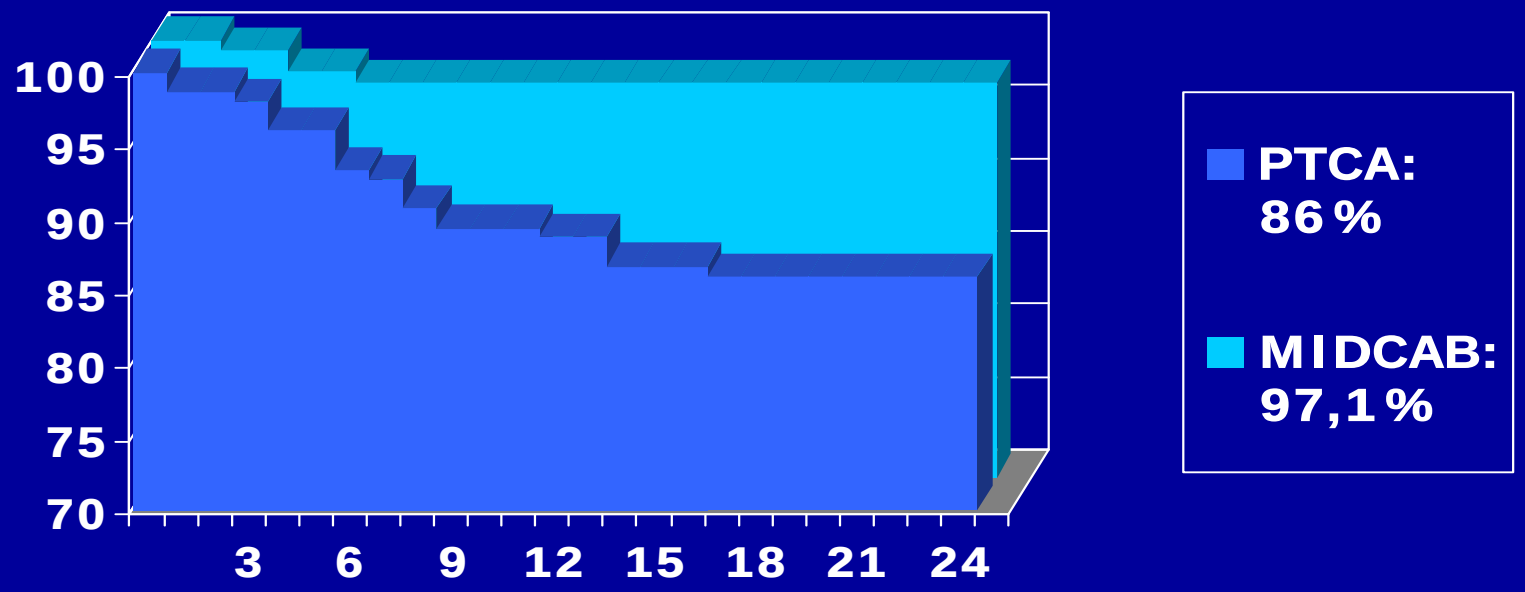
- 2 stenoses of LIMA – LAD anast. (4 & 5 months) (0,9%)
  → PTCA of the anastomosis
  (multiple preop PTCA LAD, occluded LAD, subsequent PTCA RCA/Cx)
- 1 occlusion of LIMA after 3 years (0,5%)
- 3 occlusions of LIMA between diag & LAD (1.3%)
  → PTCA of the LAD with 1 recurence needing reoperation (RIMA – LAD)


3D
Ex: 3179
Se: 3 +c
Volume Rendering No cut
DFOV 12.0cm
STANDARD Ph:75%
SPR
Bouge St LUC
DAUBY PAUL
M 73 387782
Nov 03 2003
0 L 102 LAO 22 CRA
A
S
R
P
I
L
No VOI
kv 140
mA 340
0.3
0.6 mm0.325:1/0.6sp
Tilt: 0.0
07:00:01 PM
W = 4095 L = 2048
IAL

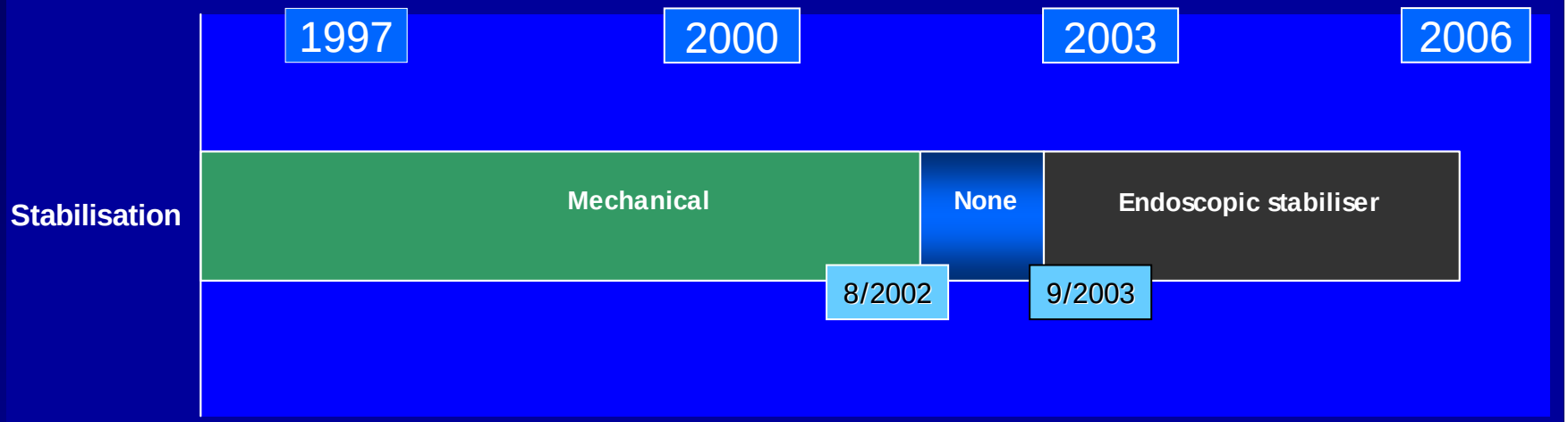

3D
Ex: 2915
Se: 3
Volume Rendering No cut
DFOV 14.0cm
STANDARD Ph:75%
SPR
Bouge St LUC
DELFORGE DESIRE
M 56 143242
Oct 22 2003
0 L 96 LAO 23 CRA
A
S
R
P
I
L
No VOI
kv 140
mA 345
0.3
0.6 mm0.3:1/0.6sp
Tilt: 0.0
12:33:35 PM
W = 4095 L = 2048
IAL

FREEDOM FROM LAD-RELATED RECURENCE of ISCHEMIA




100
95
90
85
80
75
70
3
6
9
12
15
18
21
24
PTCA: 86%
MIDCAB: 97,1%

Evolution of the technique



Recurence of angina:
3/72 pts (4.2%)

Recurence of angina
1/82 pts (1.2%)

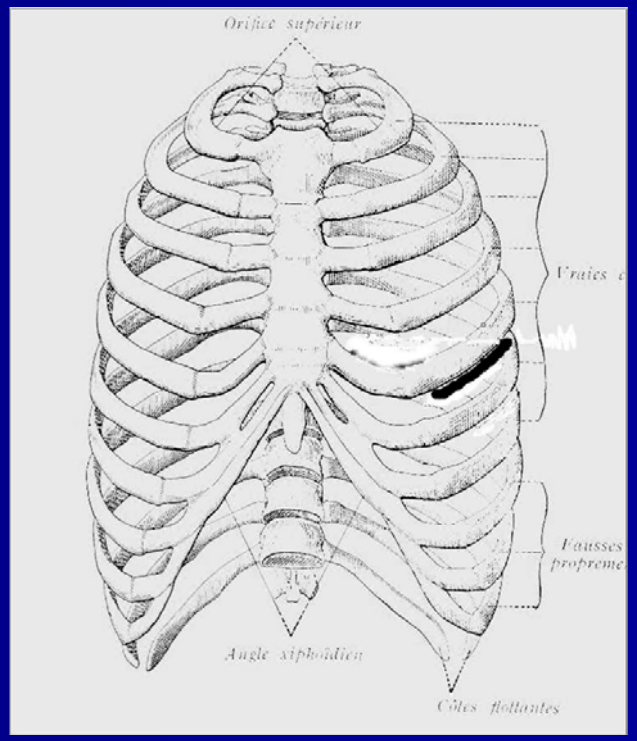
EVOLUTION : Multivessel disease

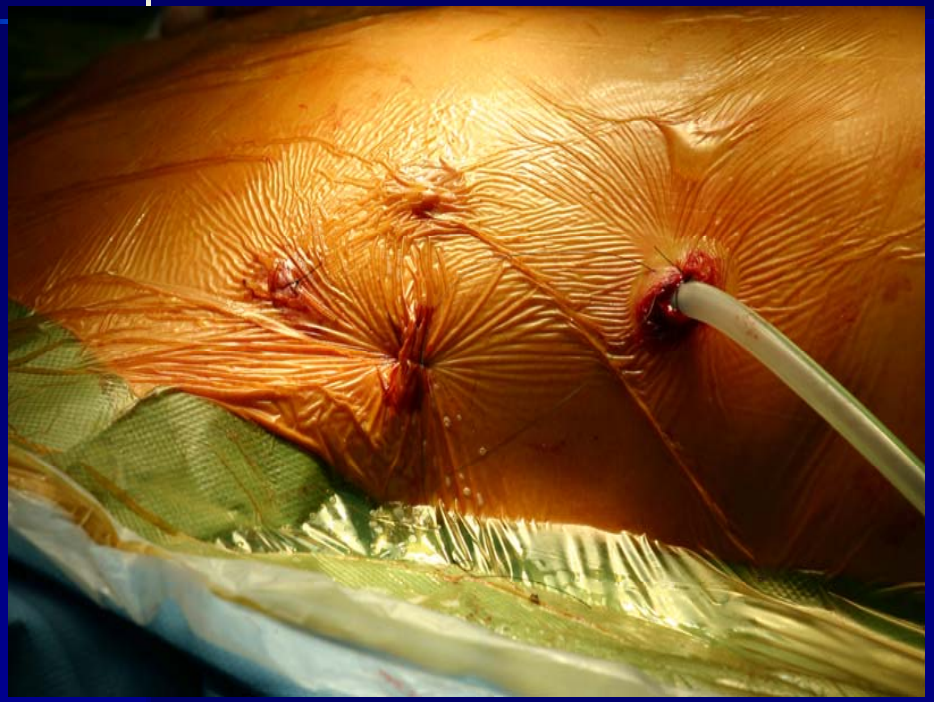
- Thoracoscopic harvesting of
  the 2 mammary arteries or 1 mammary artery and 1 radial graft

- 5th intercostal space
  minithoracotomy

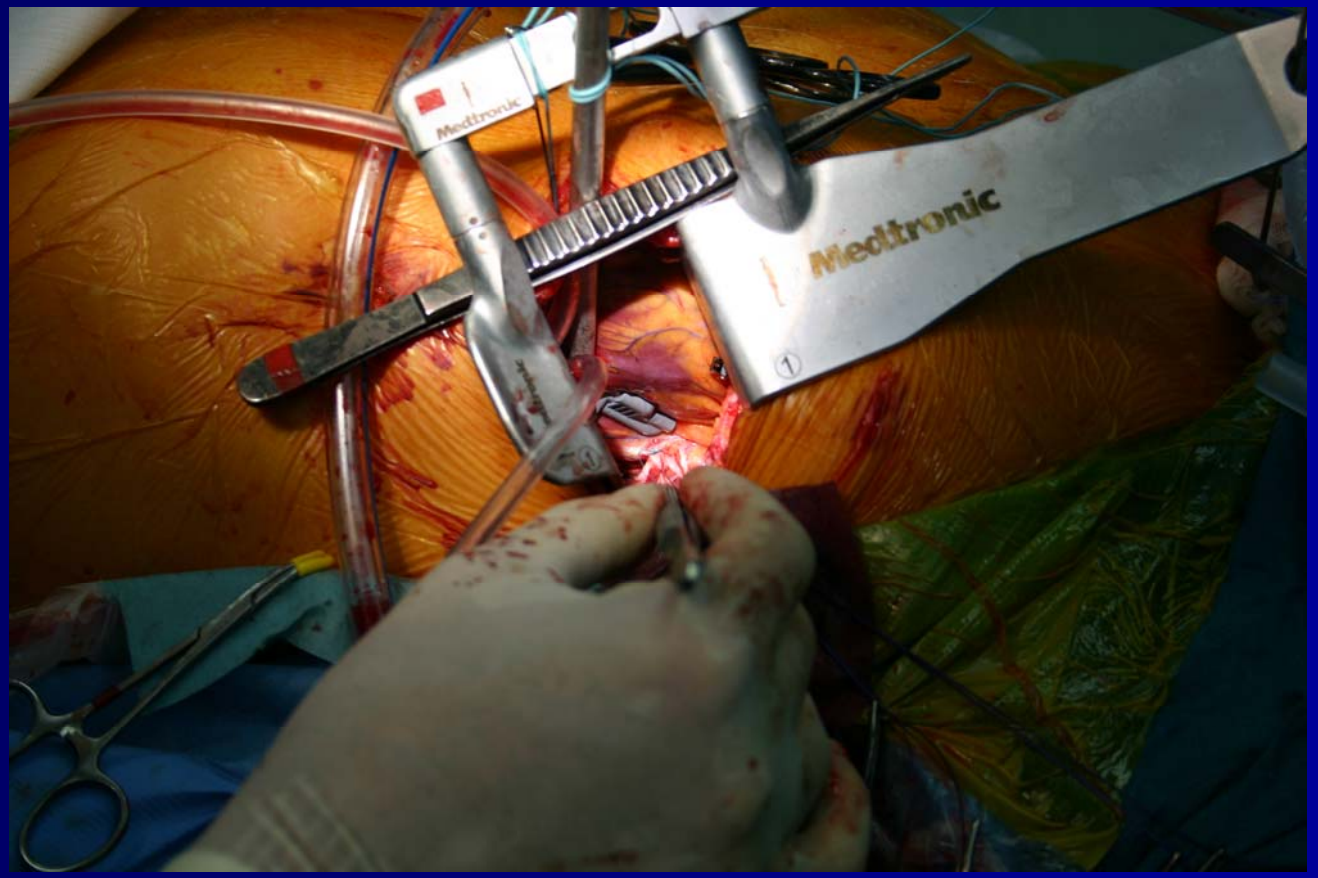
- Y- grafts

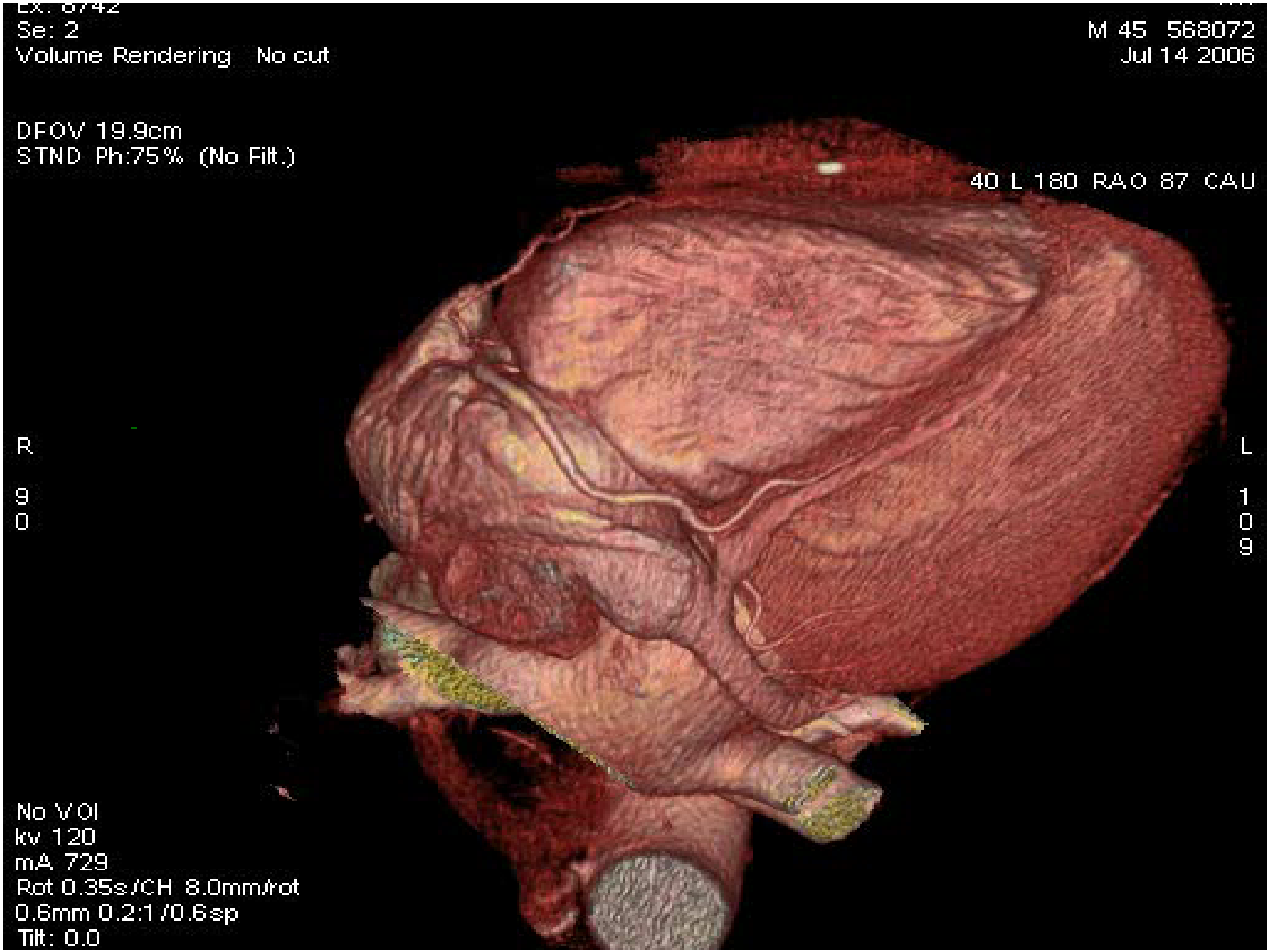
- 20 patients operated

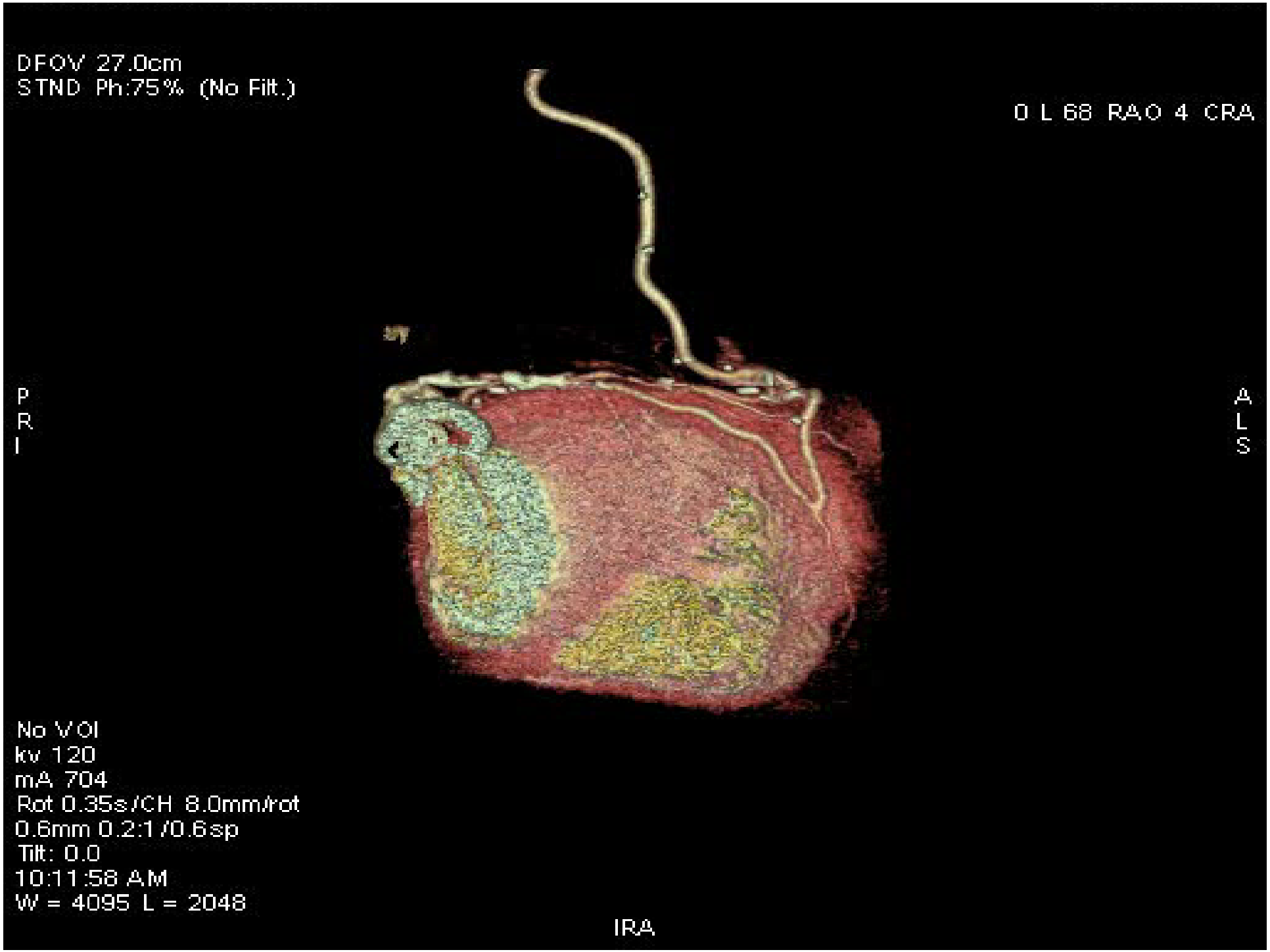





Medtronic

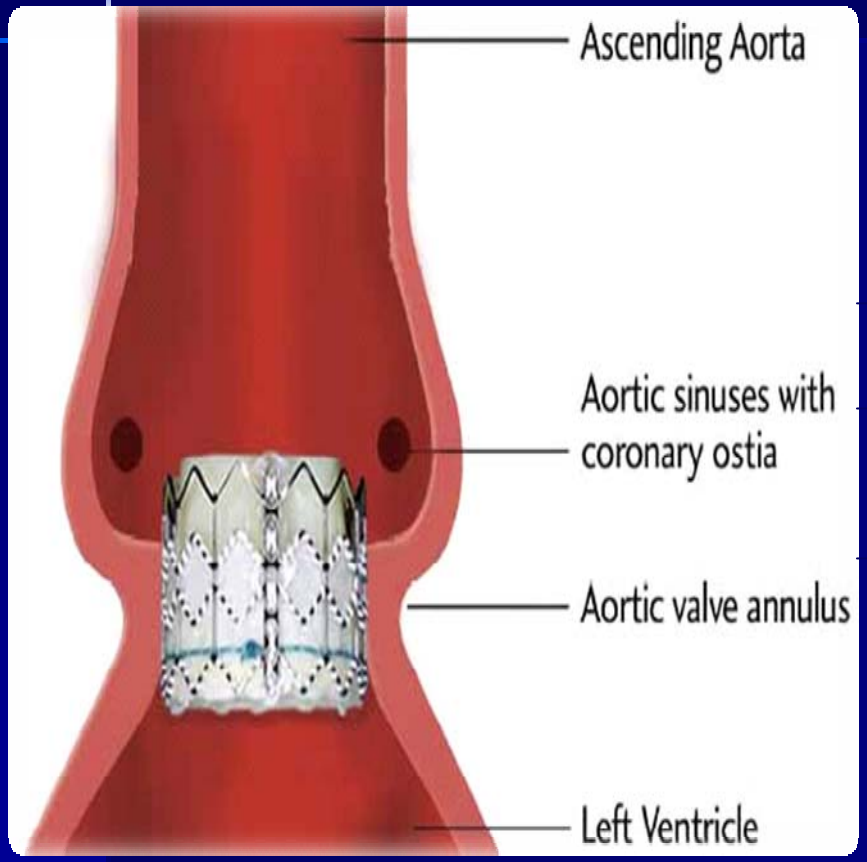

Medtronic
Medtronic

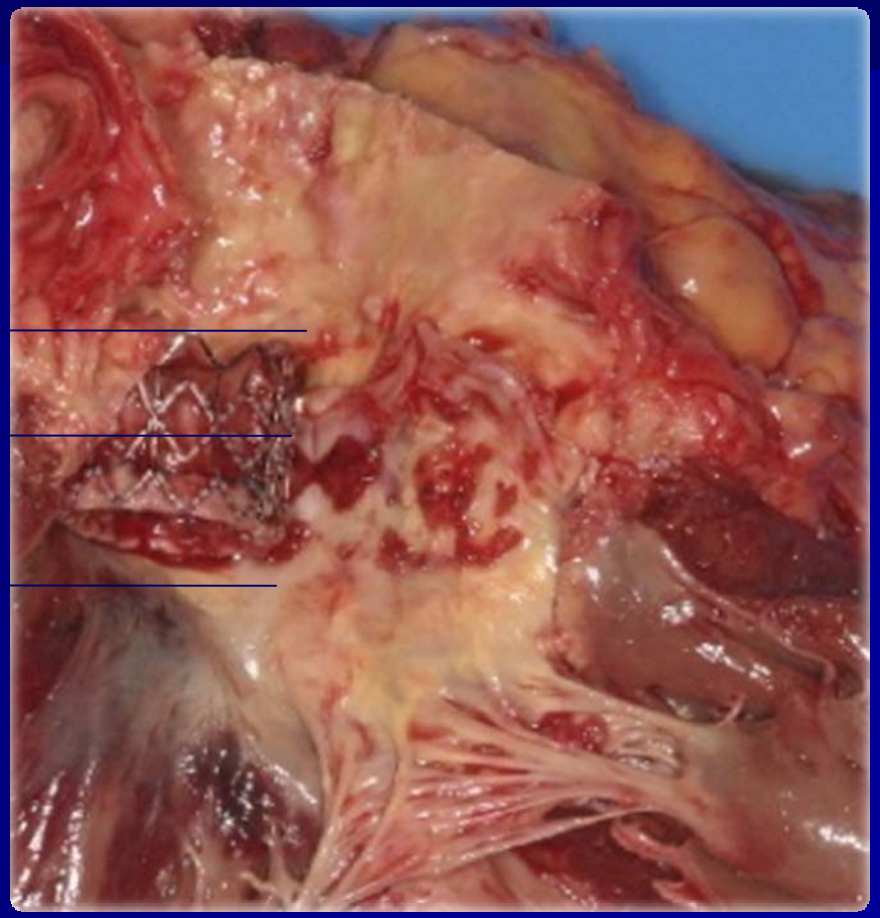

Ex: 6742
Se: 2
Volume Rendering No cut
M 45 568072
Jul 14 2006
DFOV 19.9cm
STND Ph:75% (No Filt.)
40 L 180 RAO 87 CAU
R
90
L
109
No VOI
kv 120
mA 729
Rot 0.35s/CH 8.0mm/rot
0.6mm 0.2:1/0.6sp
Tilt: 0.0


DFOV 27.0cm
STND Ph:75% (No Filt.)
0 L 68 RAO 4 CRA
P
R
I
A
L
S
No VOI
kv 120
mA 704
Rot 0.35s/CH 8.0mm/rot
0.6mm 0.2:1/0.6sp
Tilt: 0.0
10:11:58 AM
W = 4095 L = 2048
IRA

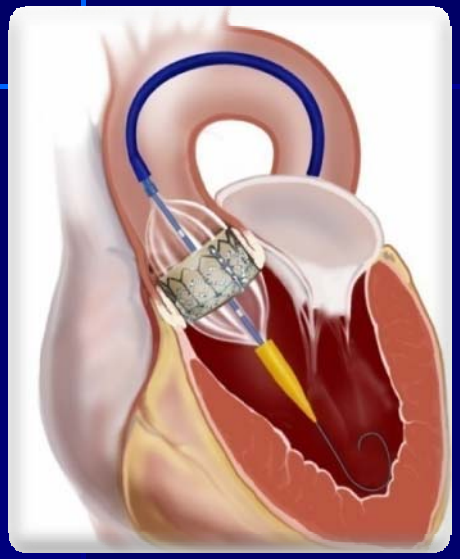
What is Aortic Stenosis?

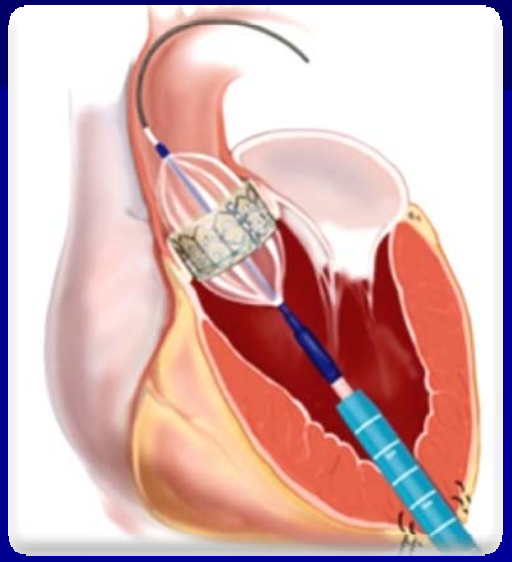
Why Design Matters?





Complementary Approaches

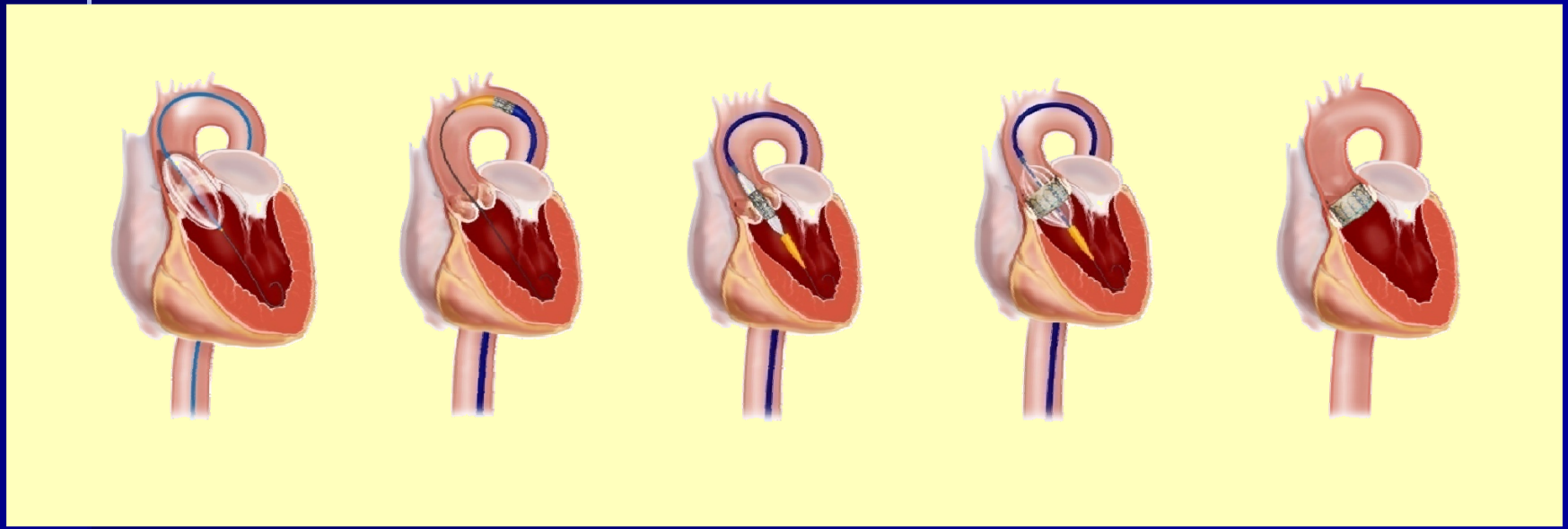




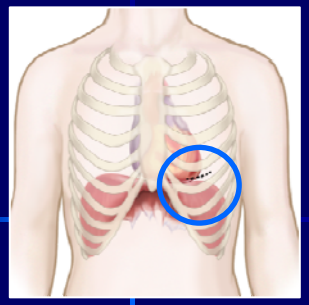
RetroFlex II™ Transfemoral Delivery System

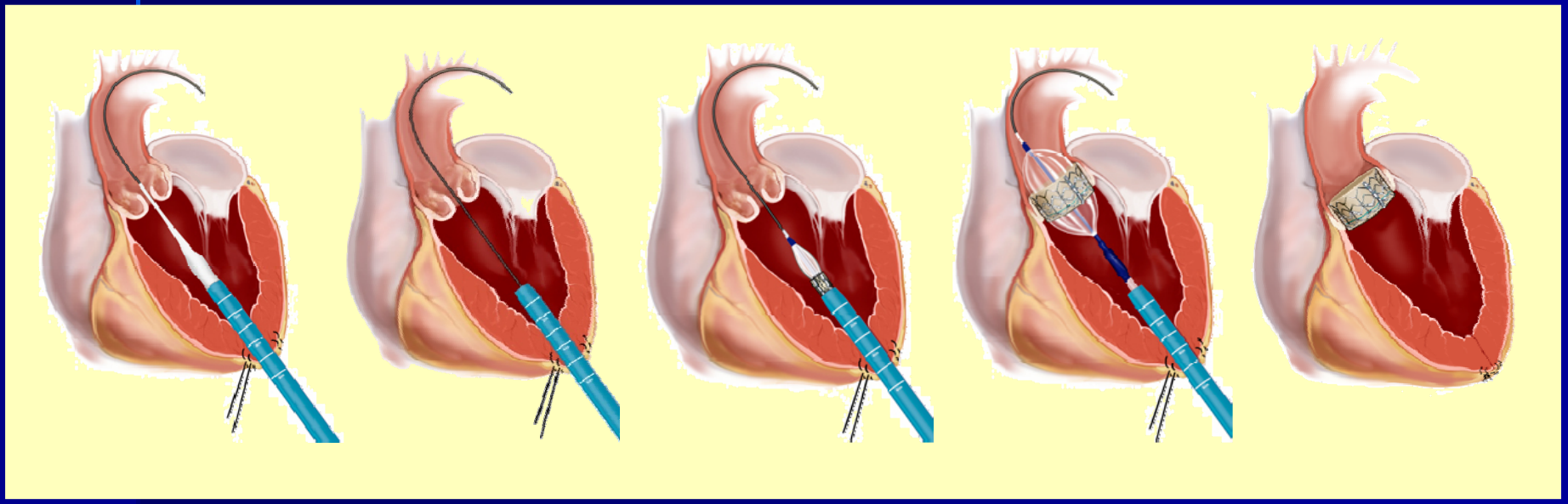
Ascendra™ Transapical Delivery System

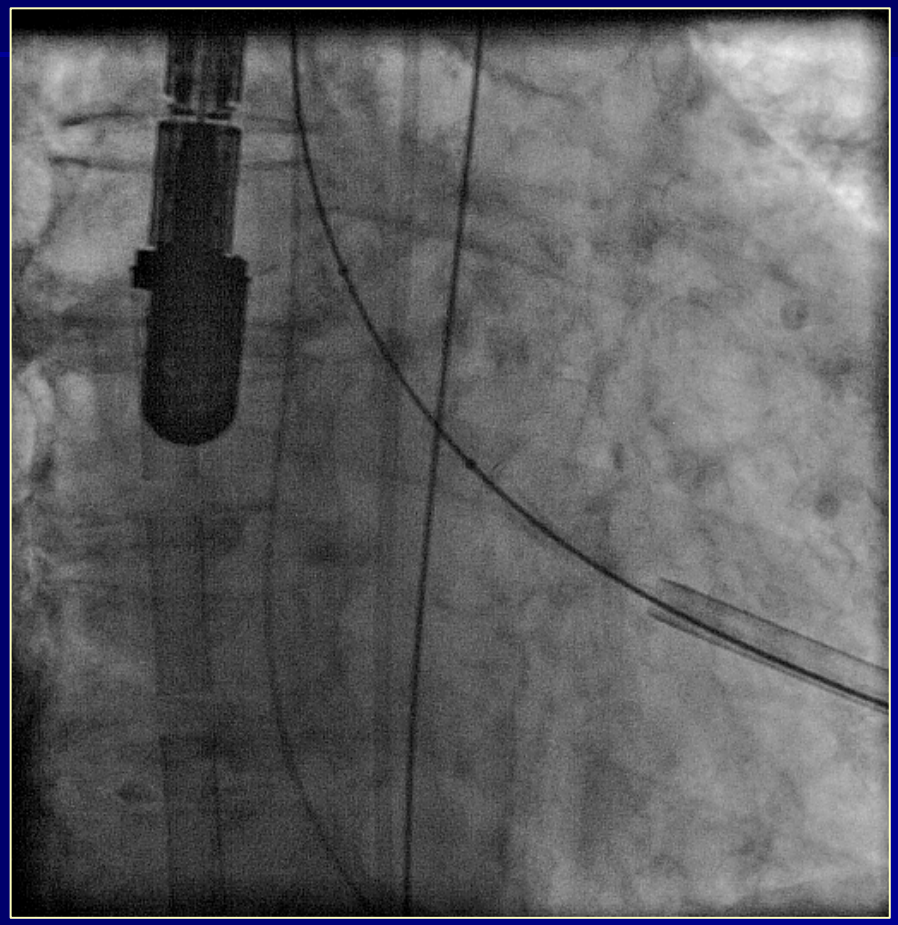
Transfemoral Approach



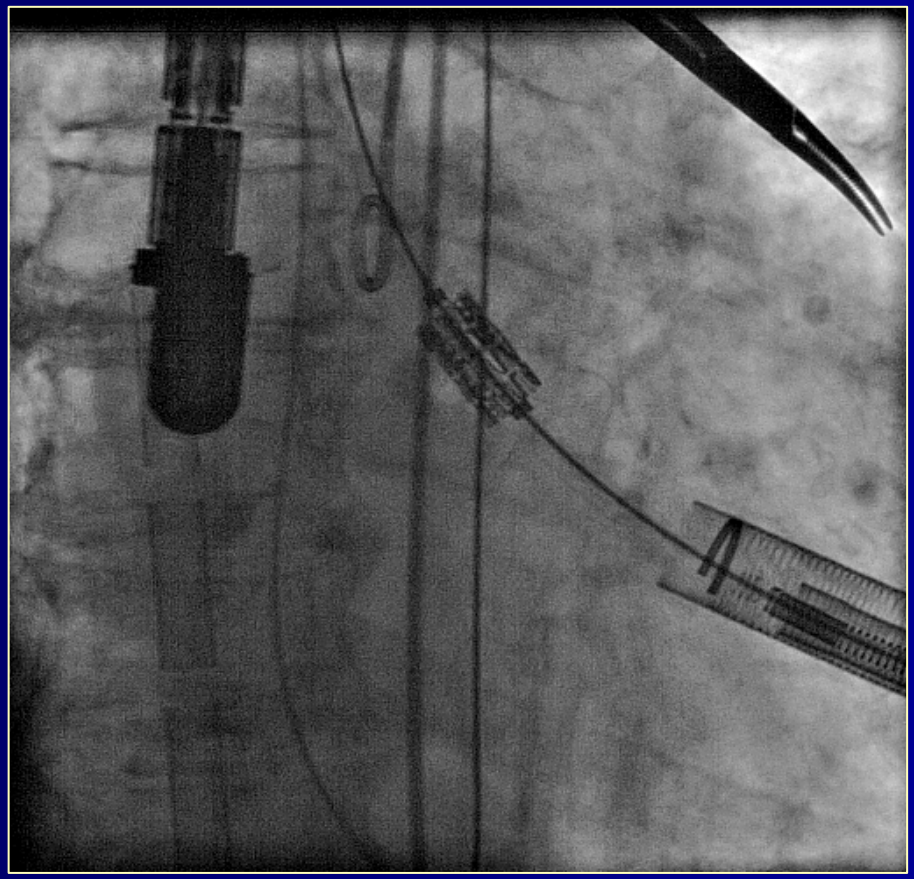
Transapical Approach



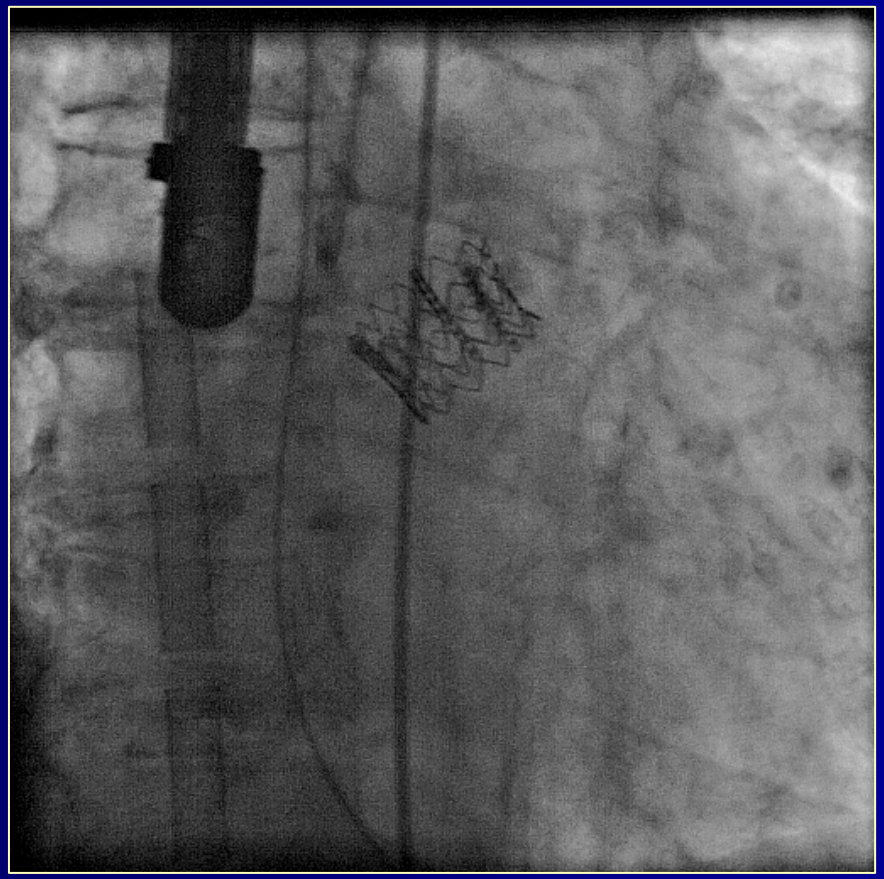




Balloon
Valvuloplasty



Valve Deployment
Fluoro



Confirmation Deployment
Fluoro