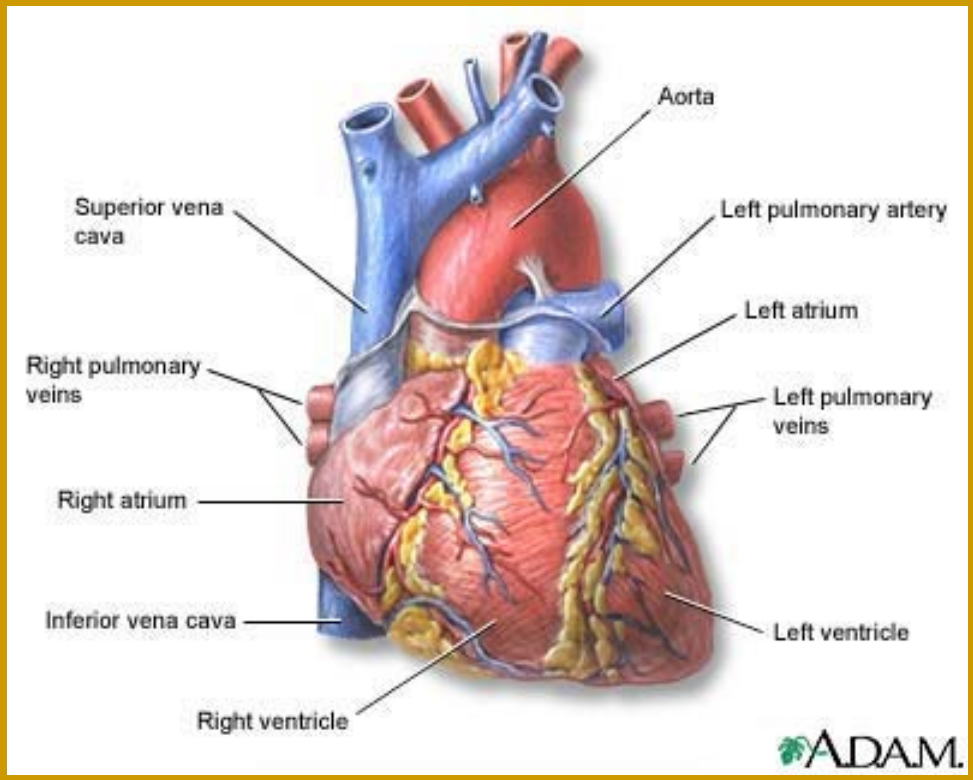
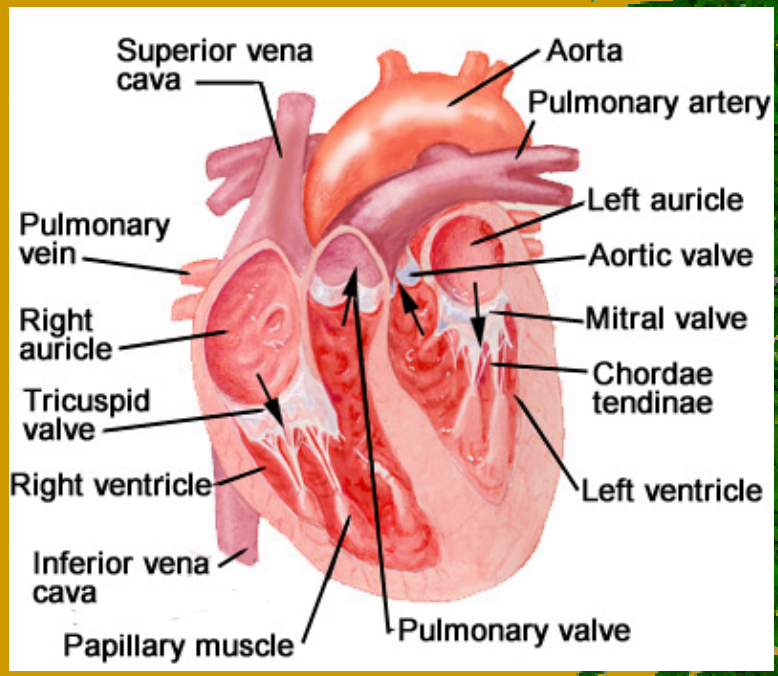
心臟血管外科常見疾病

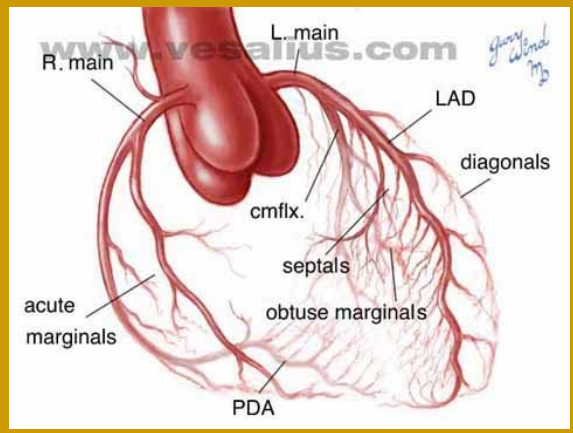
台北榮總心臟外科

施俊哲

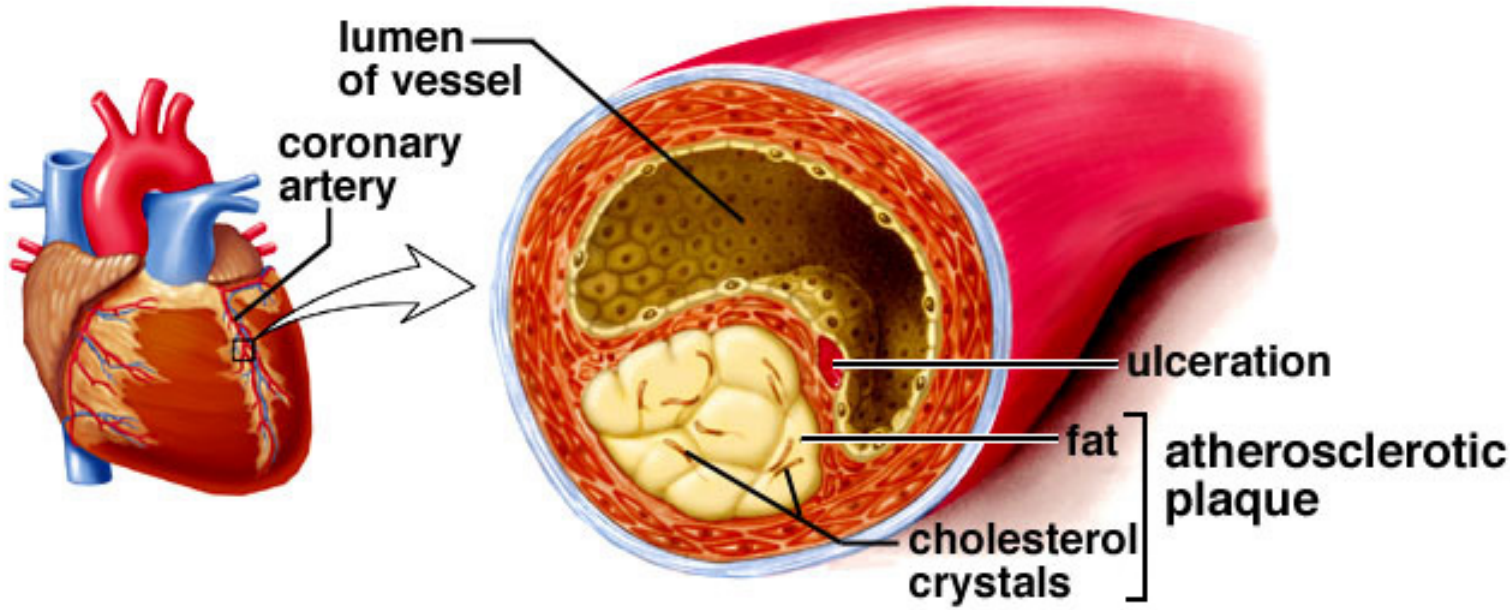

Aorta
Superior vena cava
Left pulmonary artery
Left atrium
Right pulmonary veins
Left pulmonary veins
Right atrium
Inferior vena cava
Left ventricle
Right ventricle
A.D.A.M.

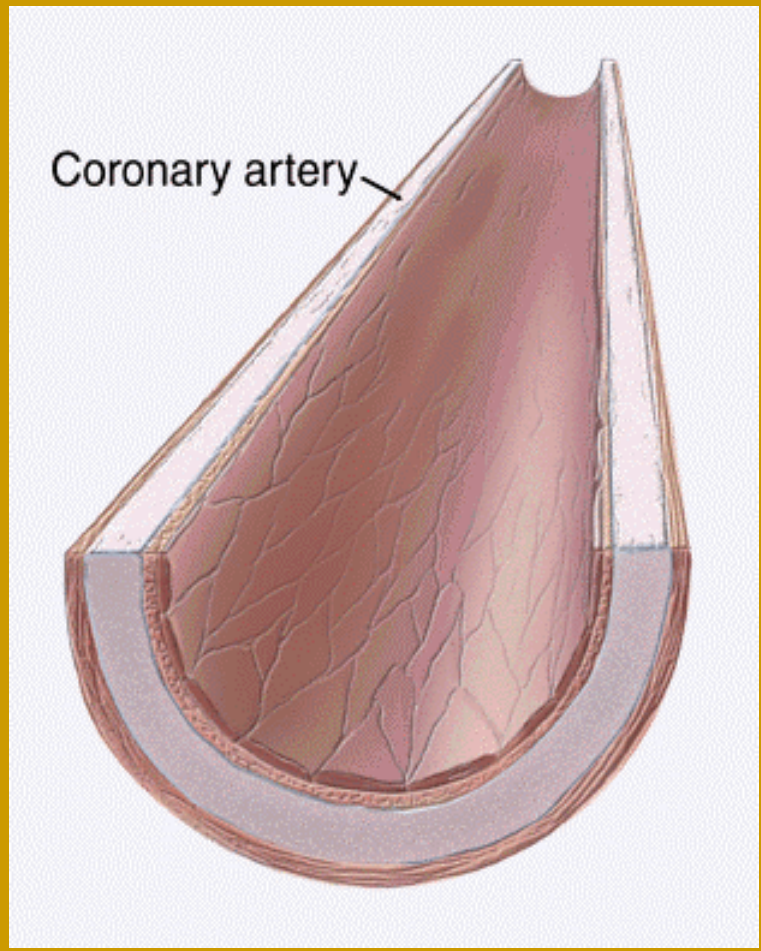

Superior vena cava
Aorta
Pulmonary artery
Left auricle
Pulmonary vein
Aortic valve
Right auricle
Mitral valve
Chordae tendinae
Tricuspid valve
Left ventricle
Right ventricle
Inferior vena cava
Papillary muscle
Pulmonary valve

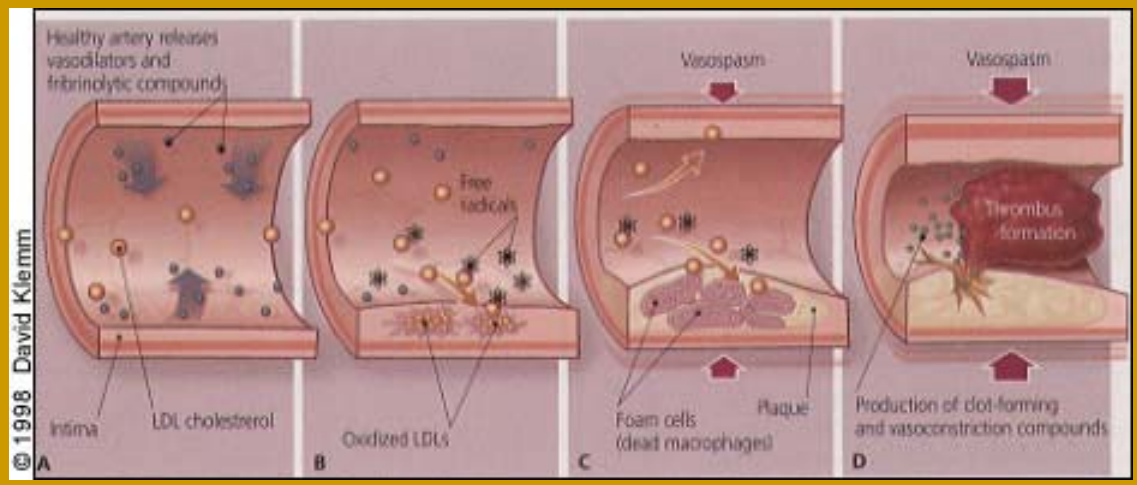
CAD

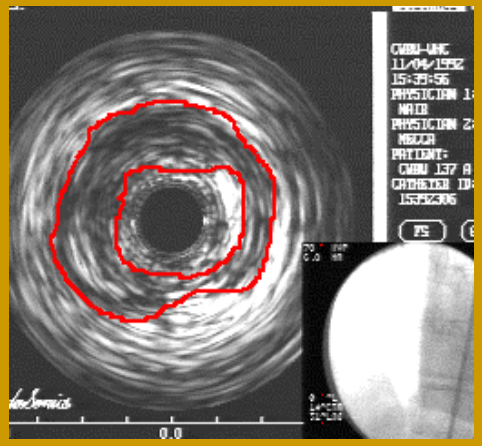

L. main
R. main
LAD
diagonals
cmflx.
septals
obtuse marginals
acute
marginals
PDA

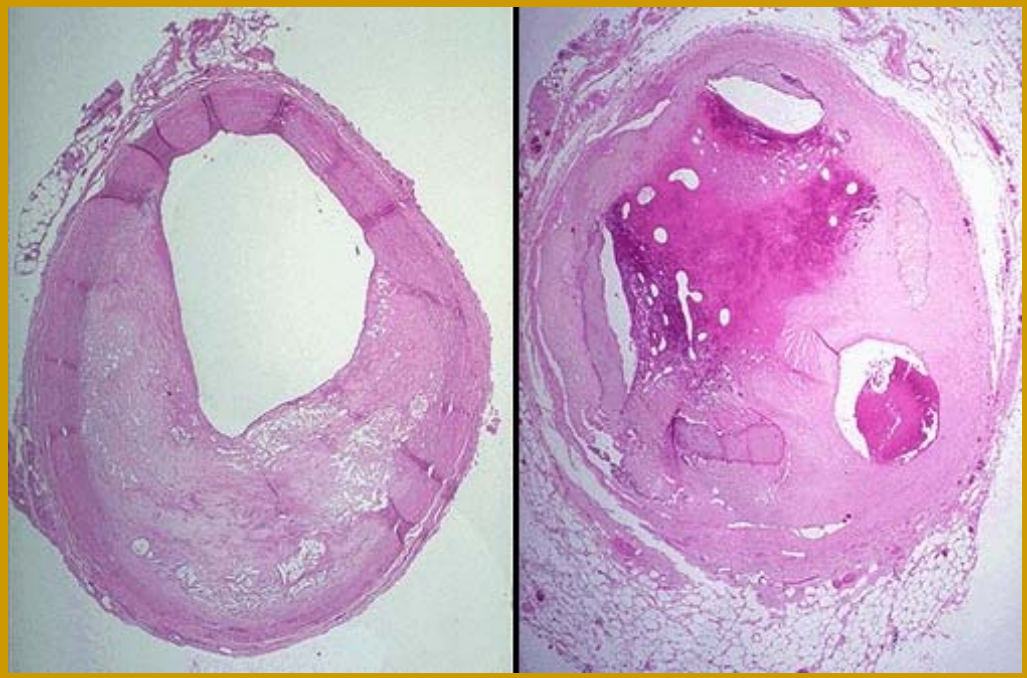
Coronary arteries and plaque



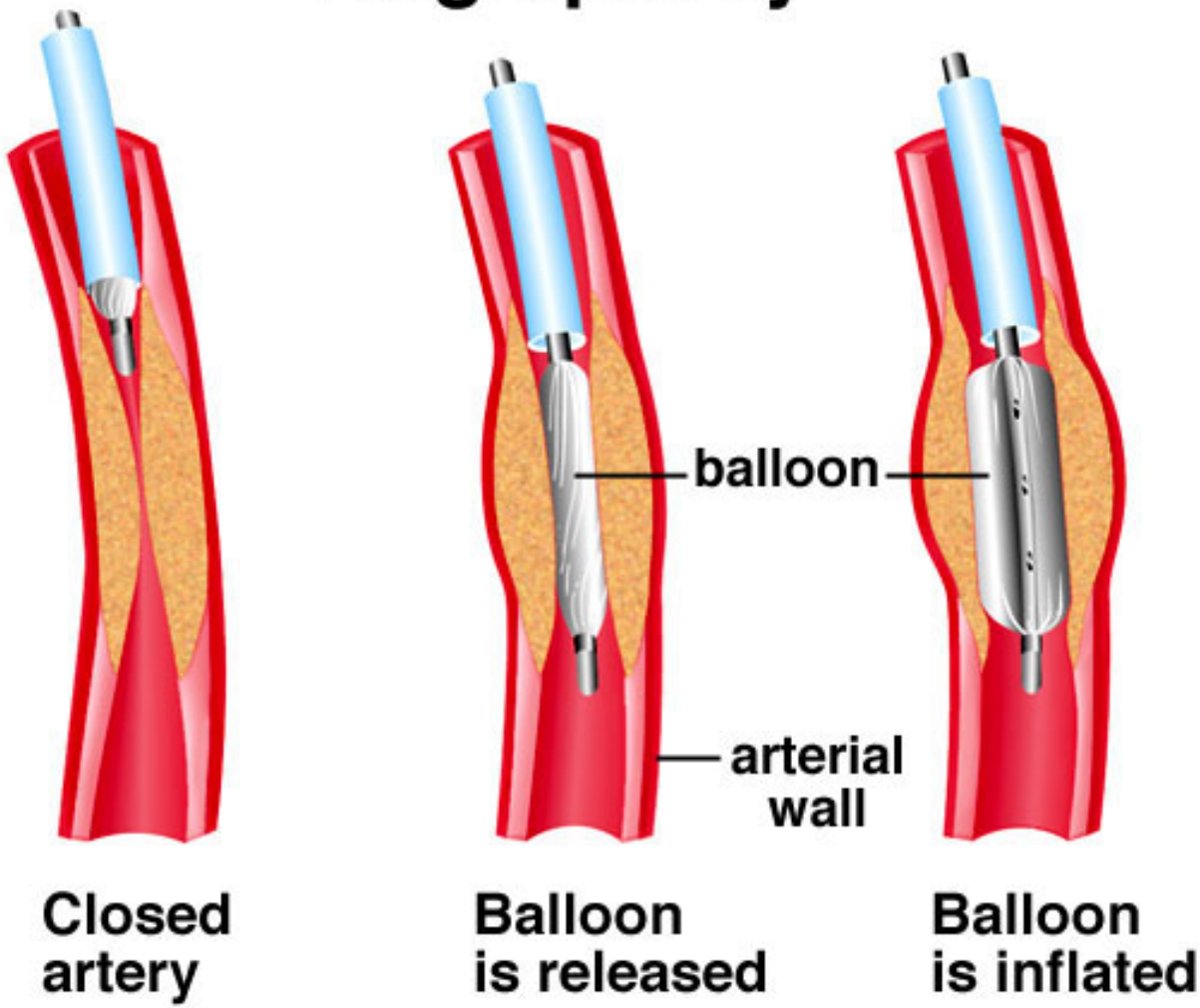

Coronary artery

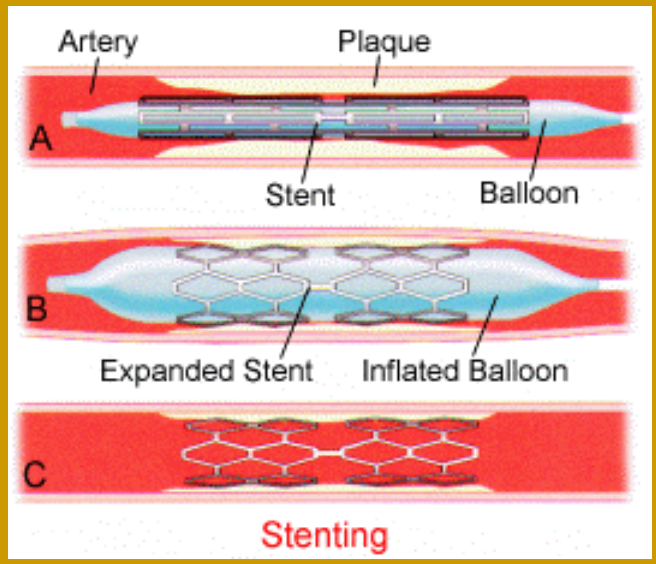

© 1998 David Klemm
Healthy artery releases vasodilators and fibrinolytic compounds
Intima
LDL cholesterol
A
Free radicals
Oxidized LDLs
B
Vasospasm
Foam cells (dead macrophages)
Plaque
C
Vasospasm
Thrombus formation
Production of clot-forming and vasoconstriction compounds
D

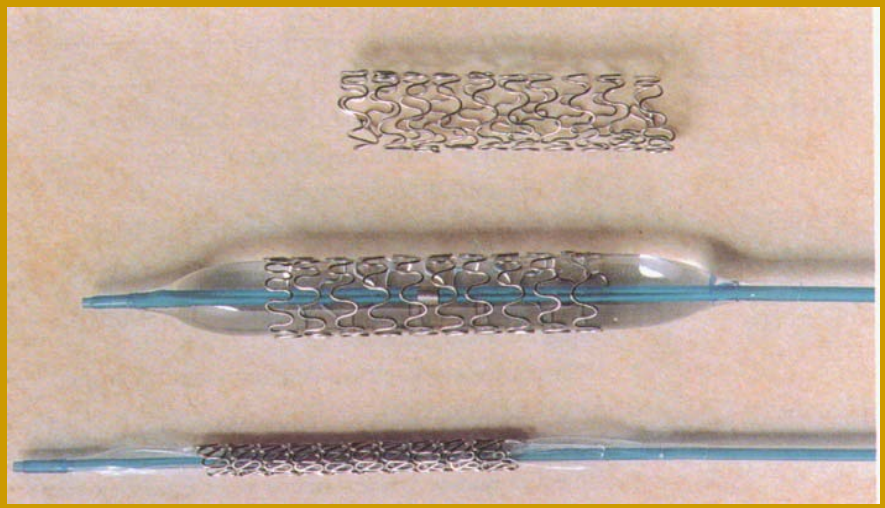




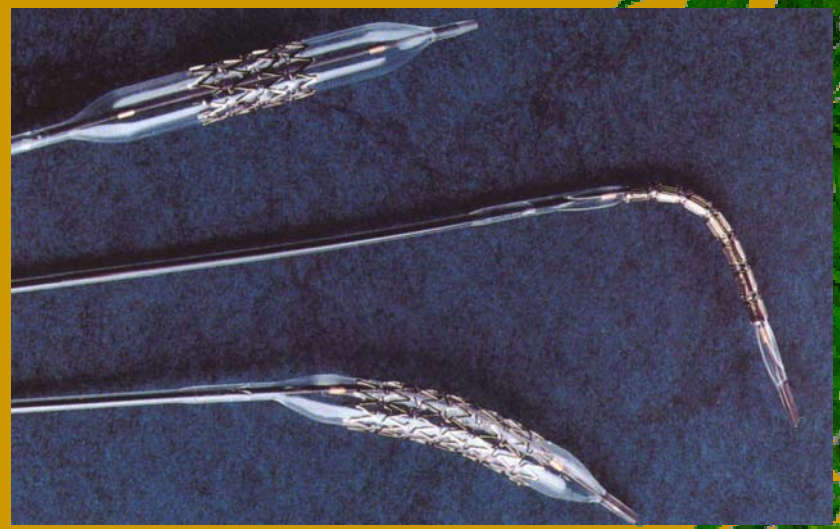
Angioplasty



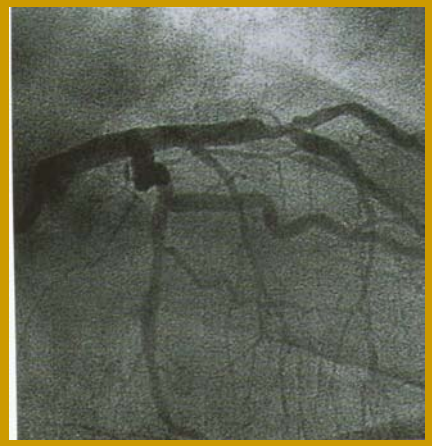


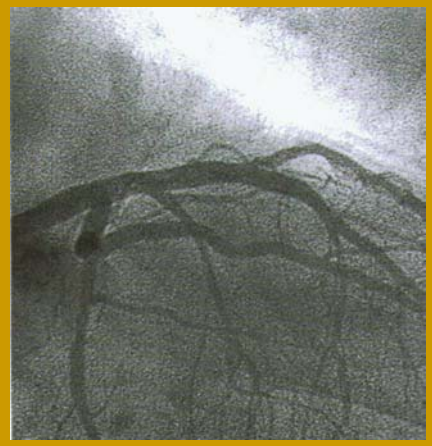


Cordis Crossflex coronary stent
316 L stainless steel

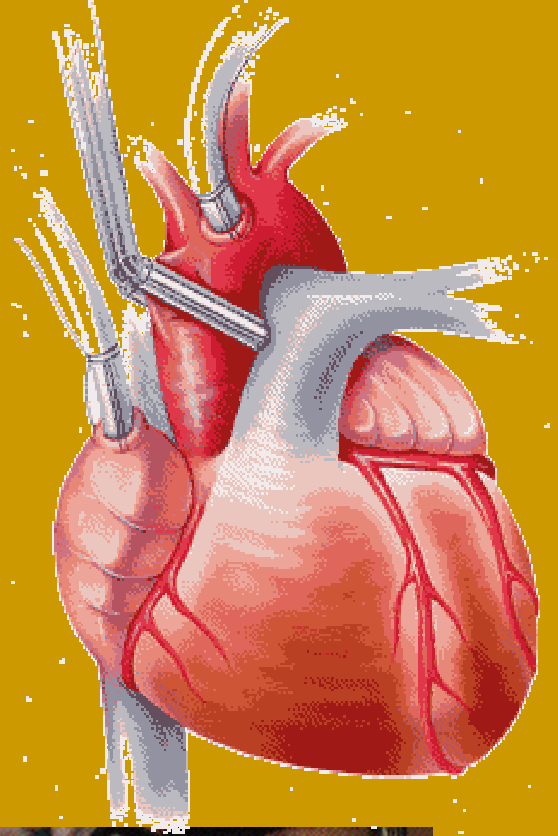


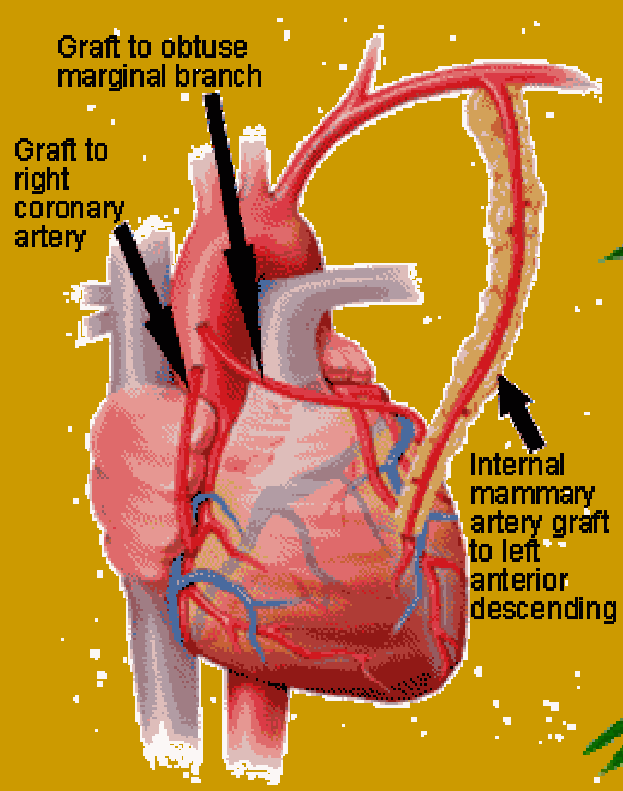
Paragon coronary stent
Nitinol

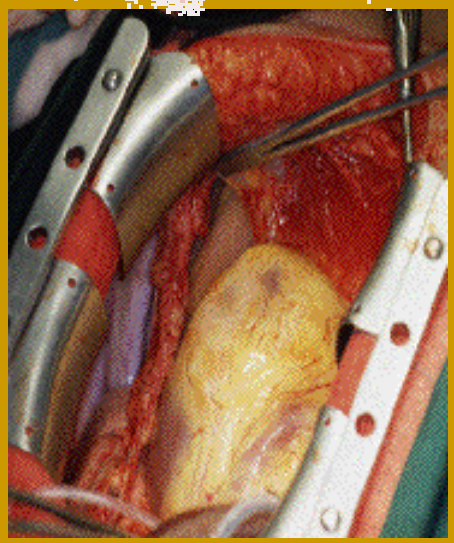


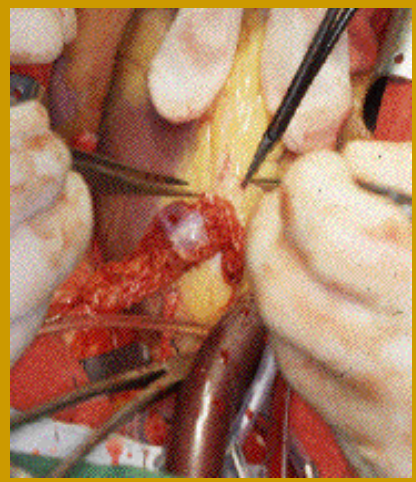


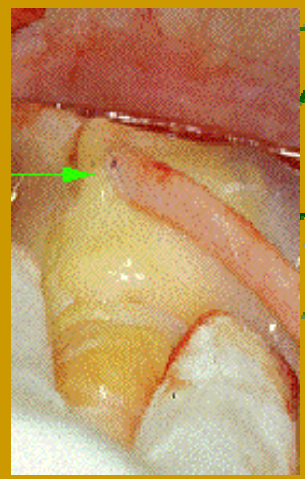
Stenting of mid-LAD lesion




Graft to obtuse marginal branch
Graft to right coronary artery
Internal mammary artery graft to left anterior descending





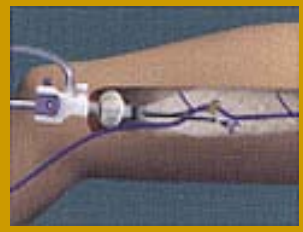



1/5X


ENDOSCOPIC VENOUS HARVEST

Making the Incision
The VasoView Uniport Plus dissection cannula is inserted into the incision

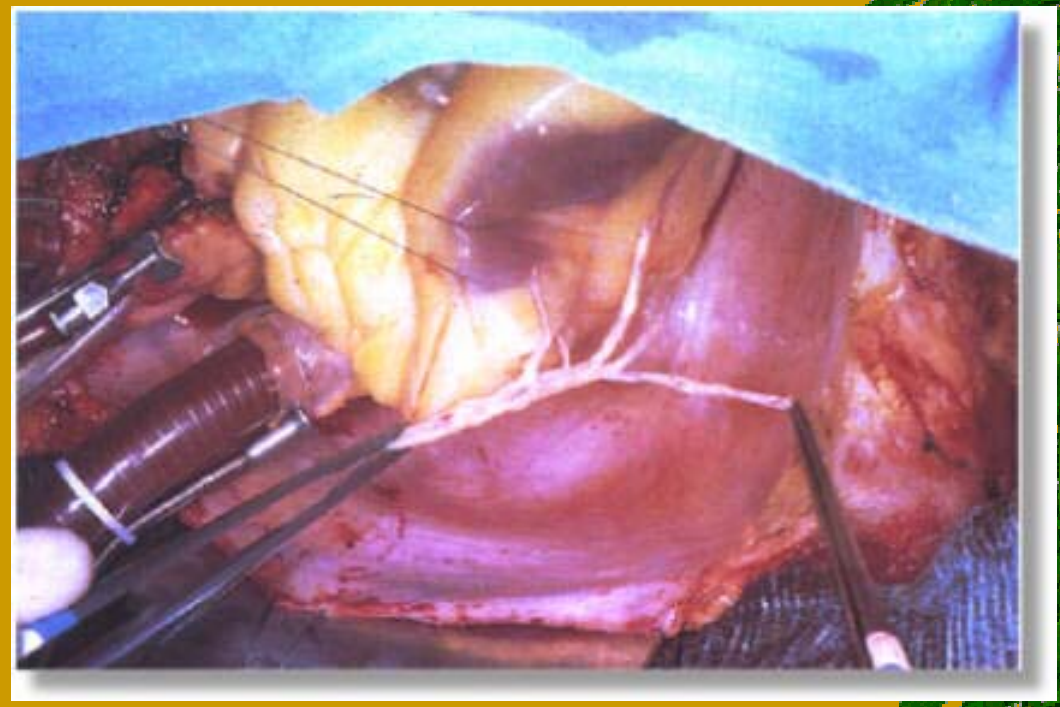
Initiating CO2 Insufflation
CO2 gas is insufflated into the tunnel. Anterior, posterior and tributary dissection begins



Cauterizing and Dividing Tributaries
The tributaries are retracted, cauterized and divided

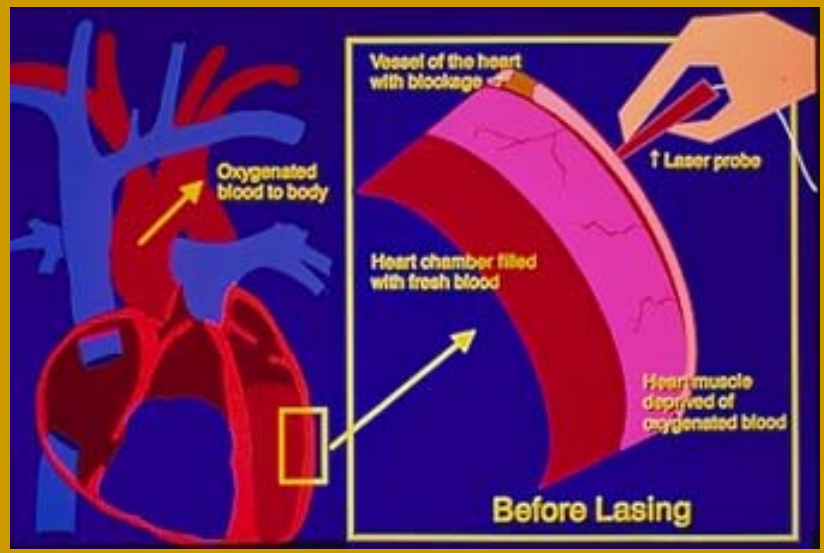
Running the Vein
The vein cradle is deployed, ensuring that the vessel is free.

VasoView Endoscopic Vessel Harvesting System

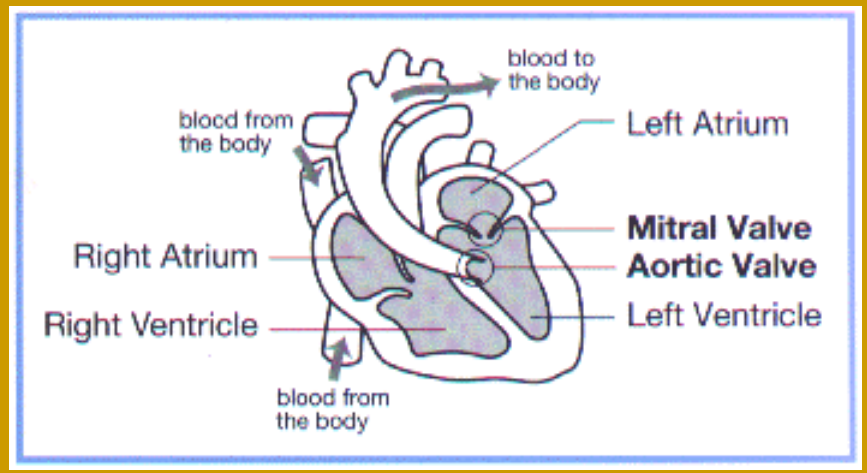


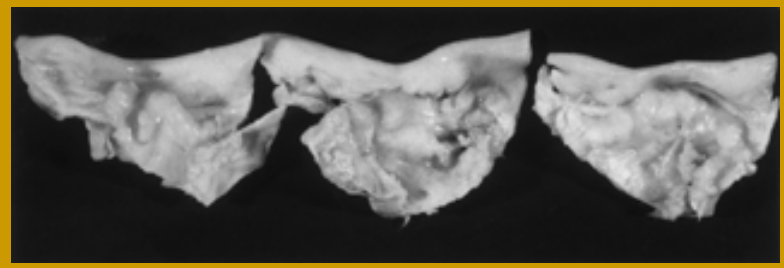

KLINIKA ZA
KARDIOHIRURGIJU
Đ. MIODRAG
10. IV. 1994

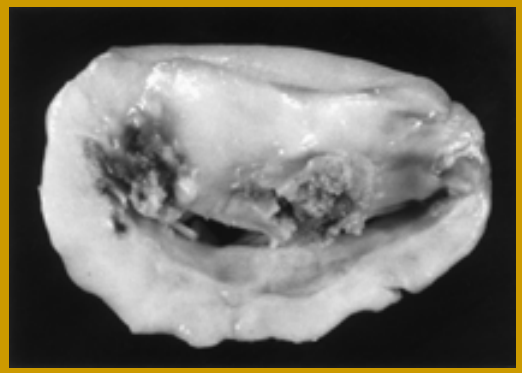
TMR

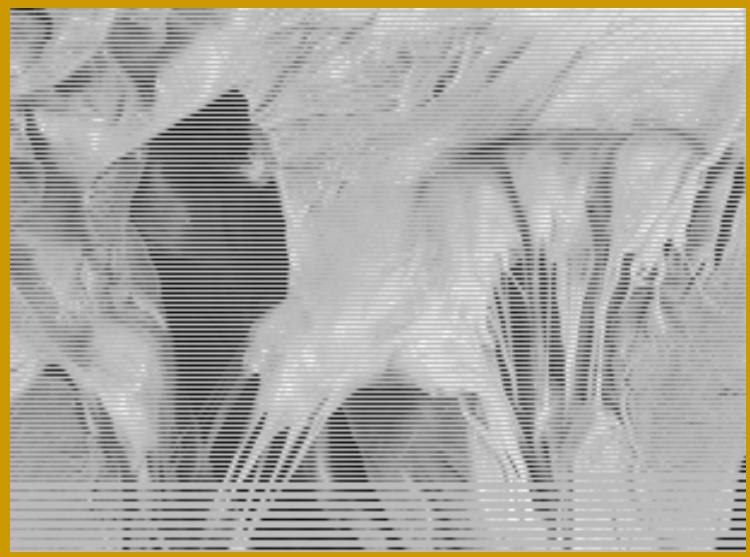

Vessel of the heart with blockage
Laser probe
Oxygenated blood to body
Heart chamber filled with fresh blood
Heart muscle deprived of oxygenated blood
Before Lasing

Valvular disease









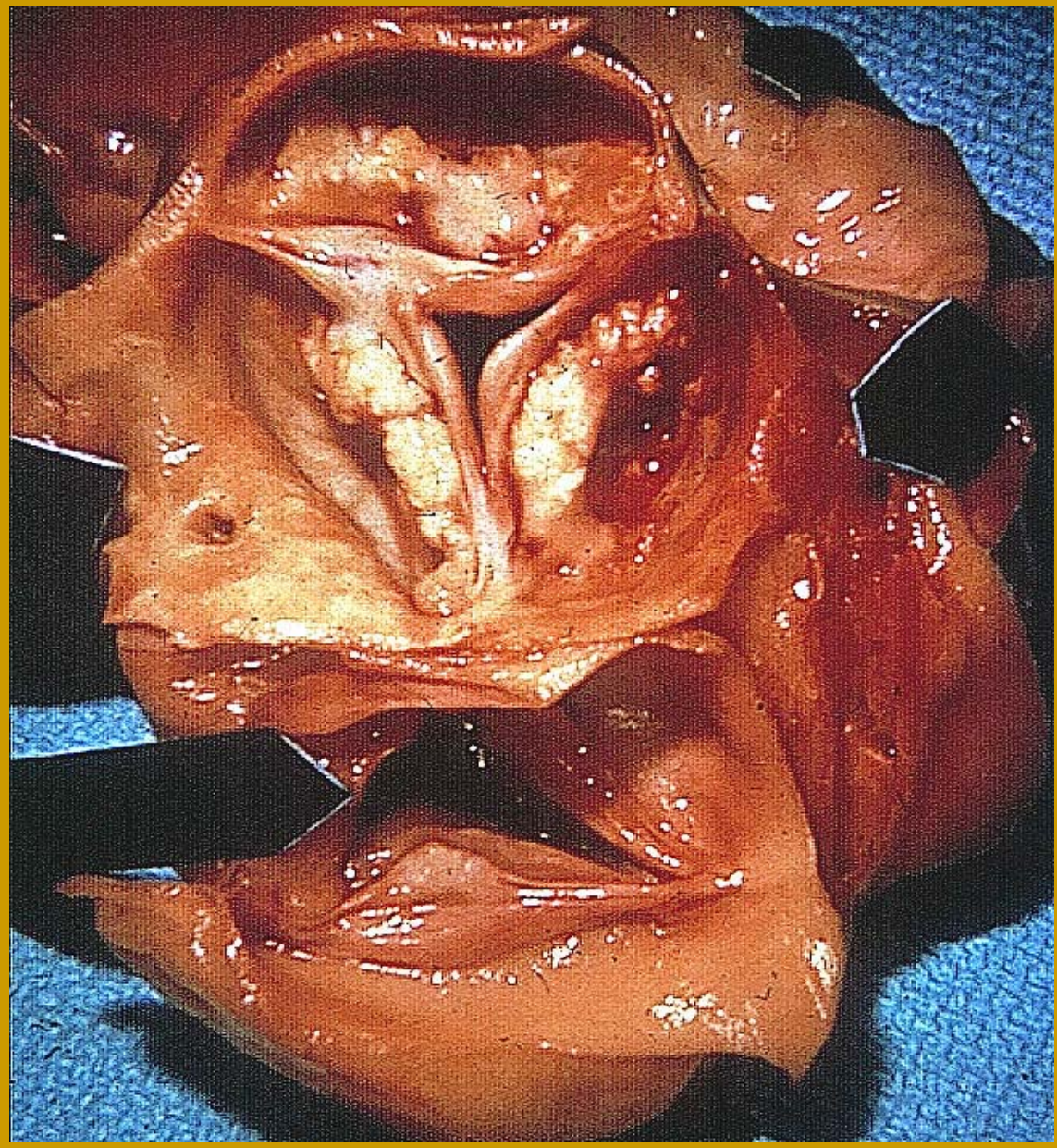
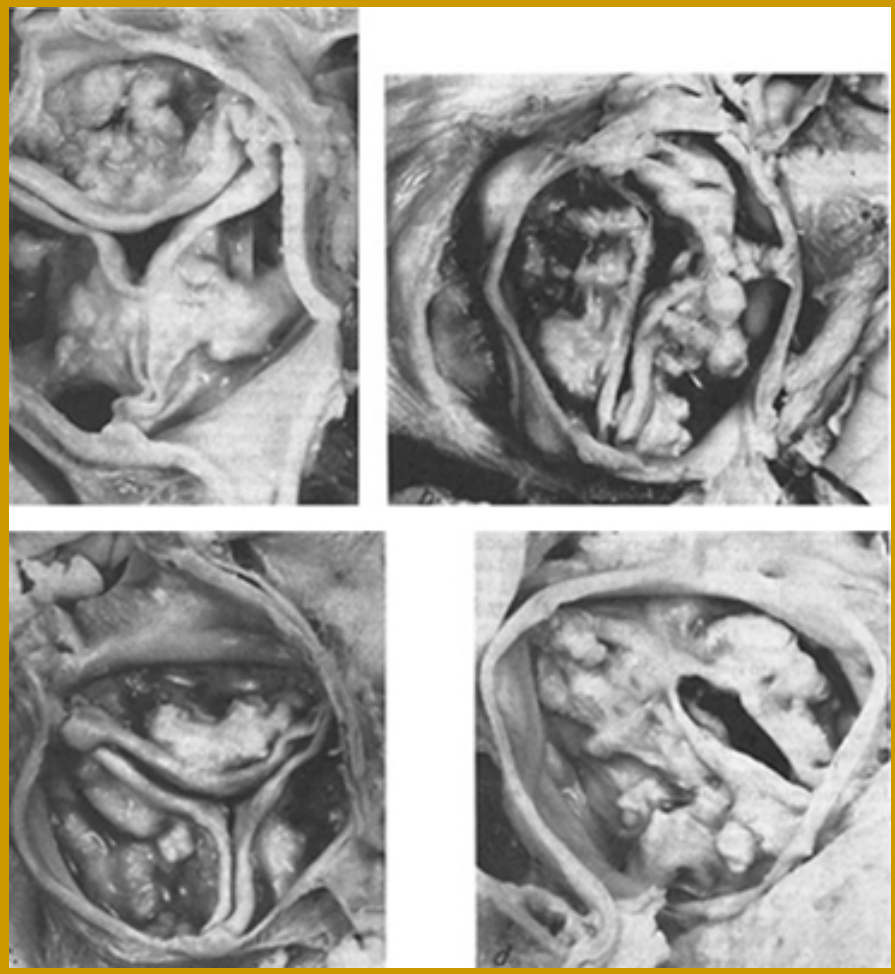


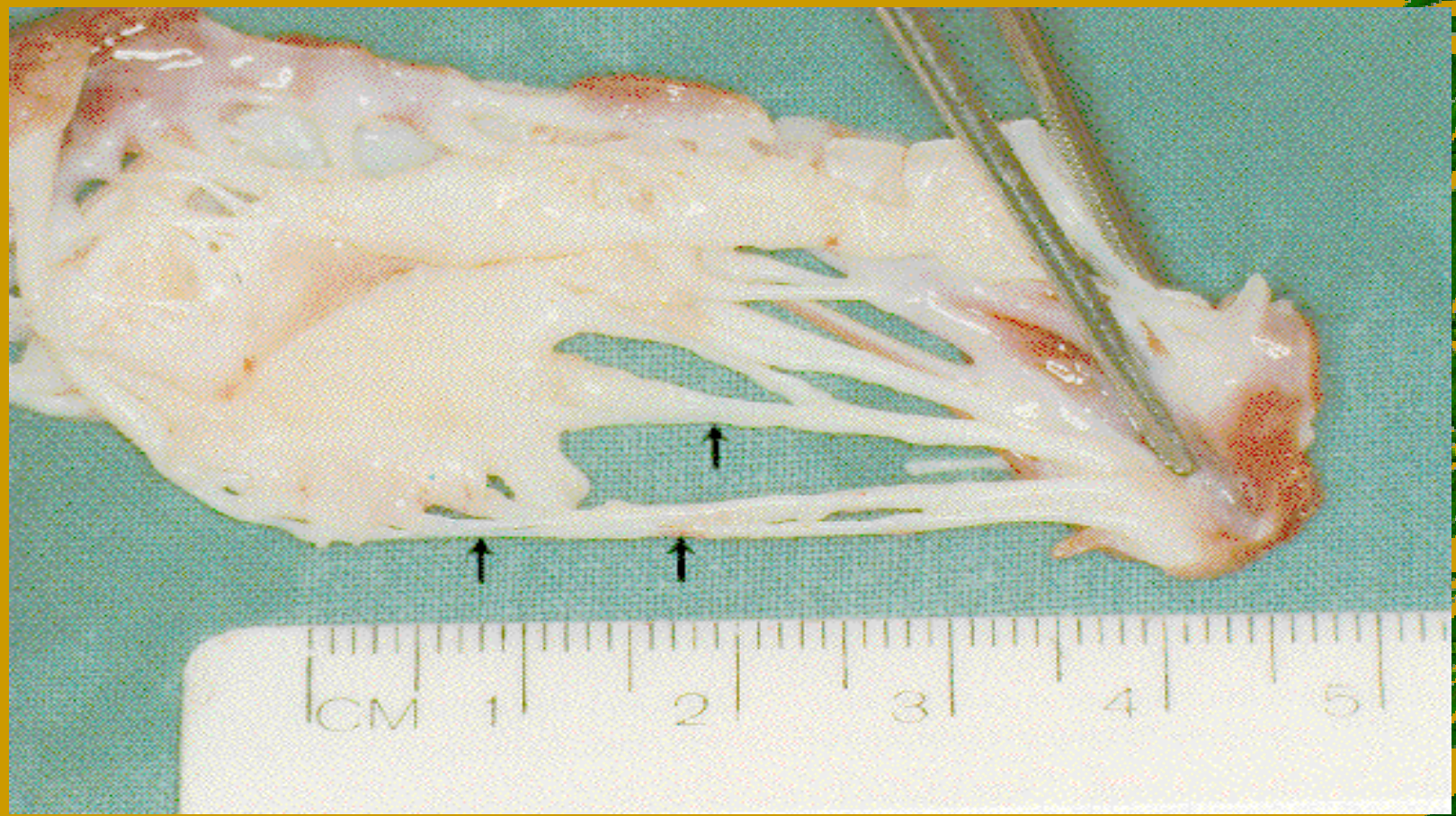
Figure: deformed by severe calcific stenosis.
Only 2 cusp like structures can be identified, markedly thickened by nodular and granular calcific aggregates



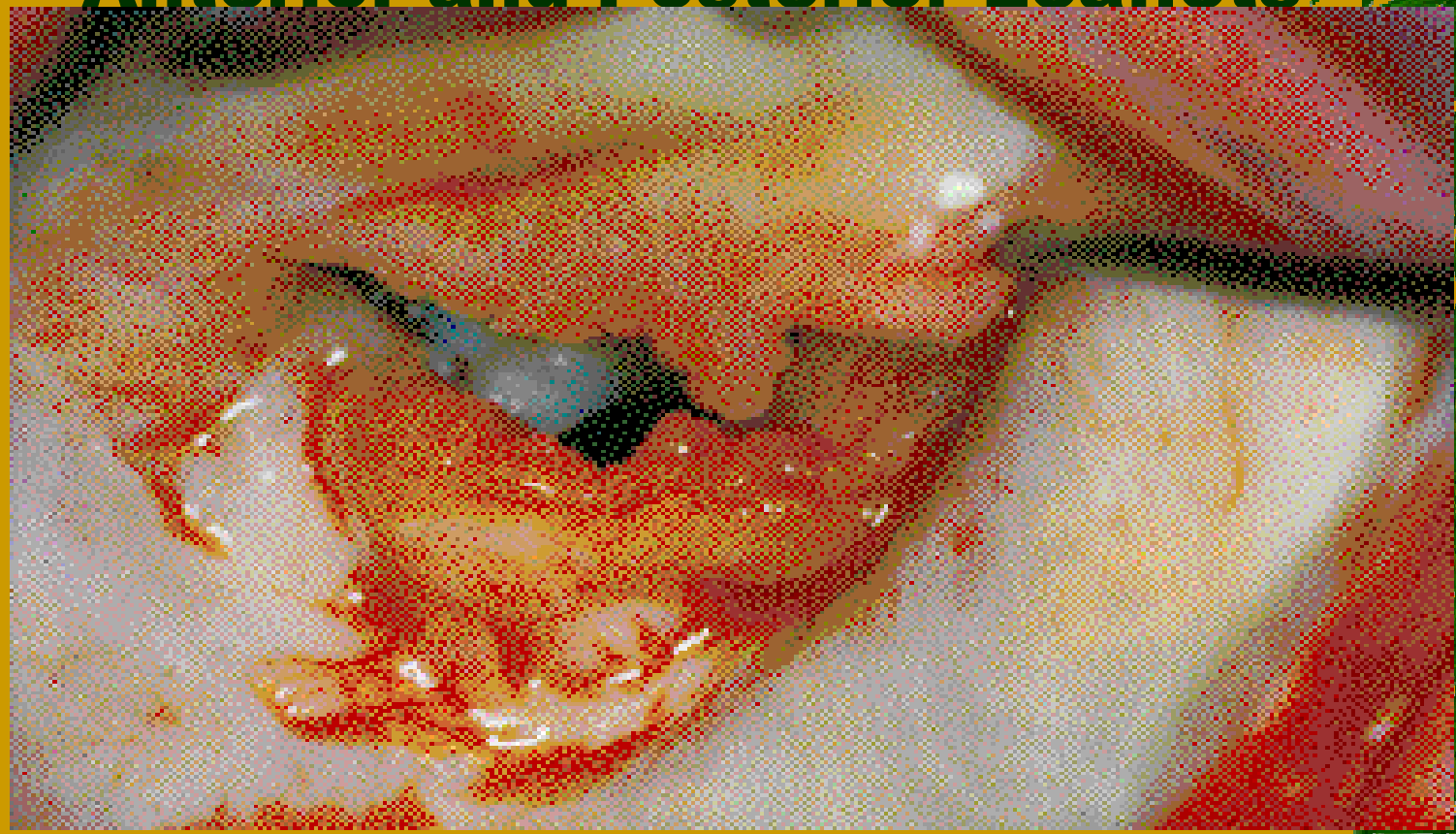
Four types of calcific aortic stenosis. In each, the unopened aortic valve is viewed form above.
A. Acquired bicuspid aortic valve with secondary calcification. At the center of the conjoined cusp (lower center) are elements of two preexisting cusps, now fused.
B. Congenital bicuspid valve. The characteristic raphe of the congenital bicuspid aortic valve appears at the lower portion of the figure.
C. Senile type. None of the commissures is fused, but there is a major intrinsic calcification of the three cusps.
D. Unicuspid, unicommissural congenital aortic stenosis with secondary calcification.

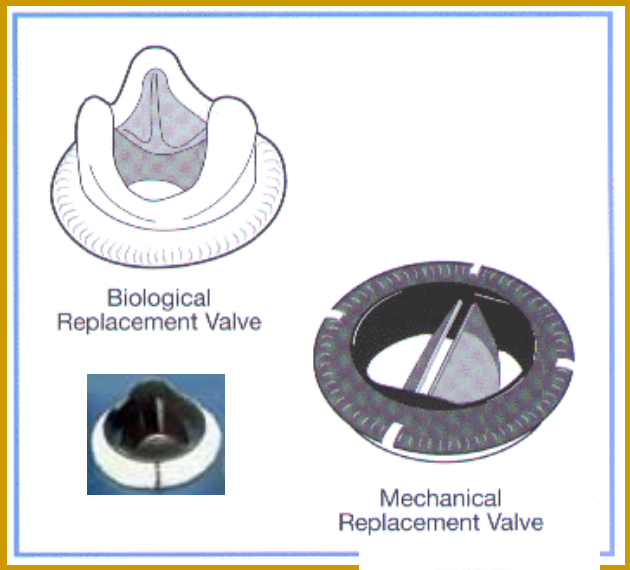
Excised Mitral Valve Showing Calcium Deposits on Leaflet Tissue

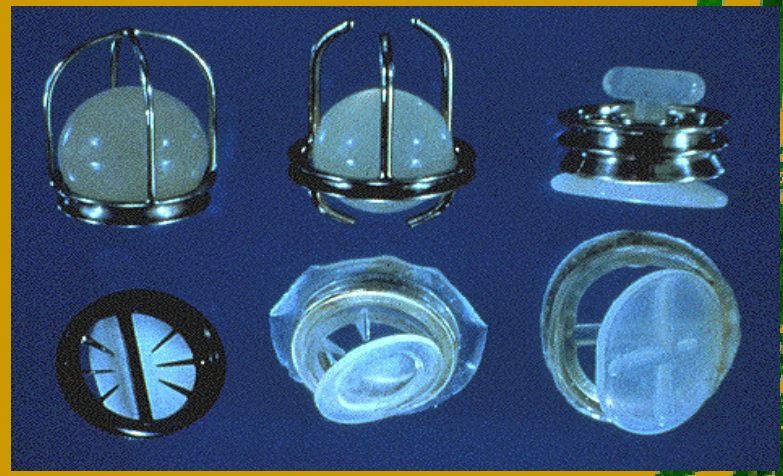
Elongated and Thinned Chordae Tendinae of the Anterior Leaflet

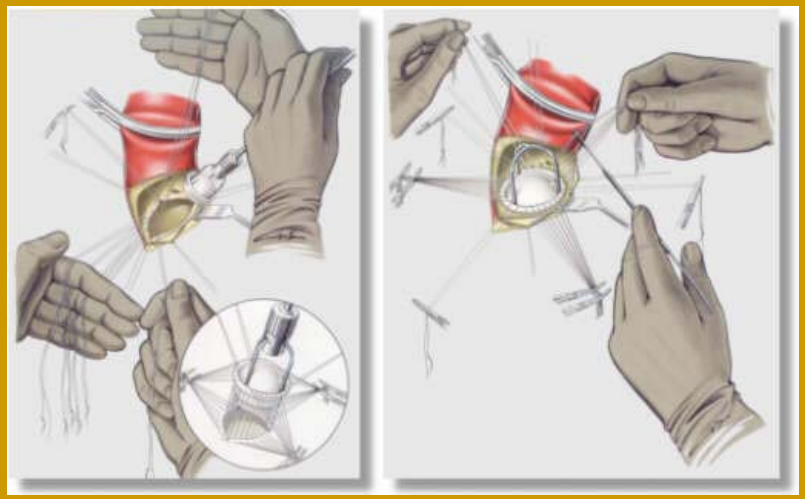


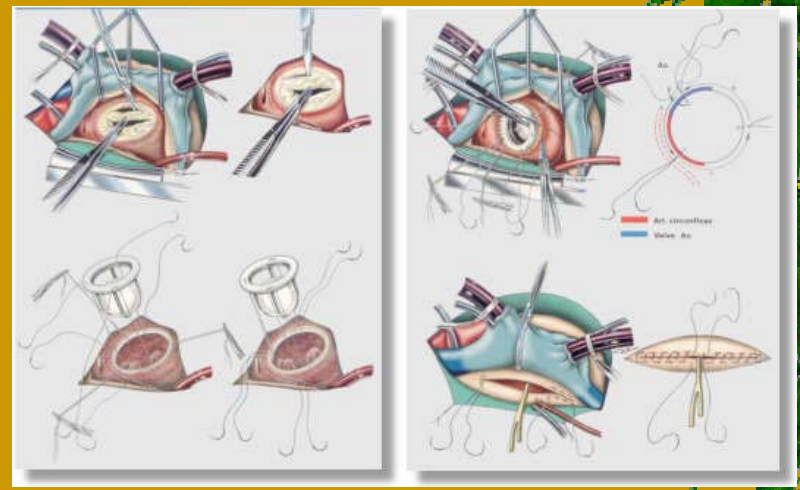
Intraoperative View of Infective Endocarditis Involving Both the Anterior and Posterior Leaflets

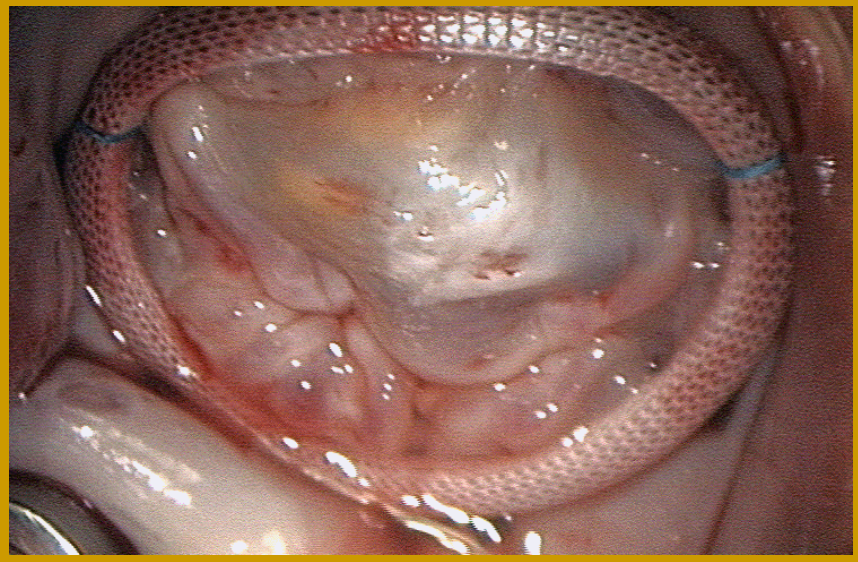


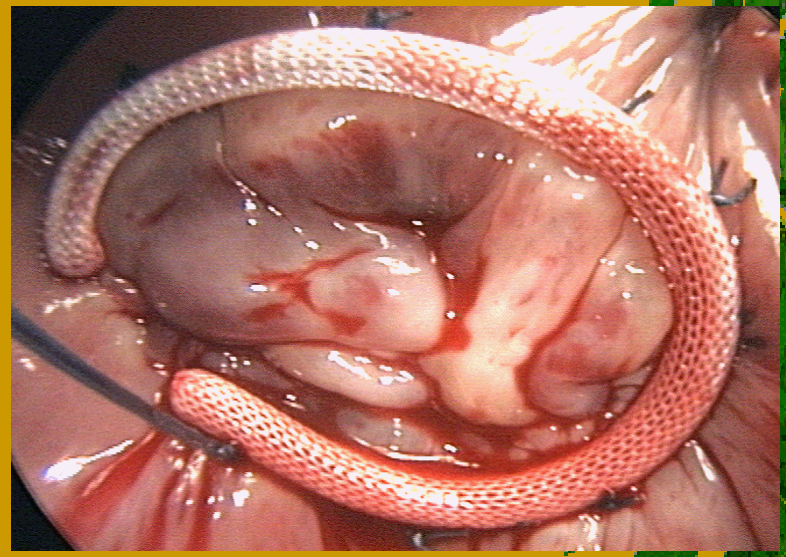

Biological
Replacement Valve
Mechanical
Replacement Valve

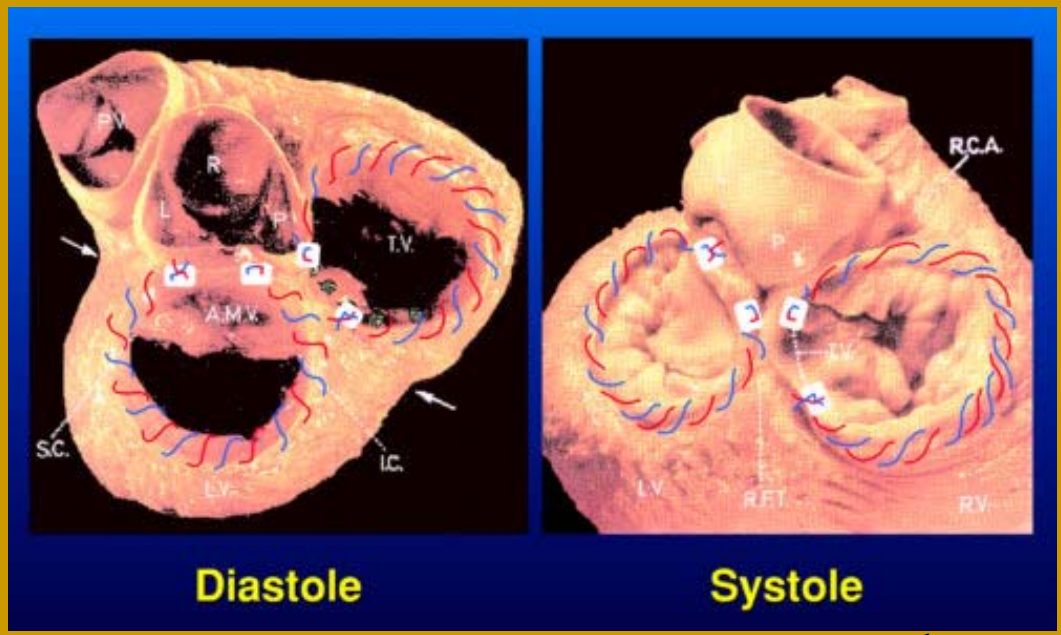




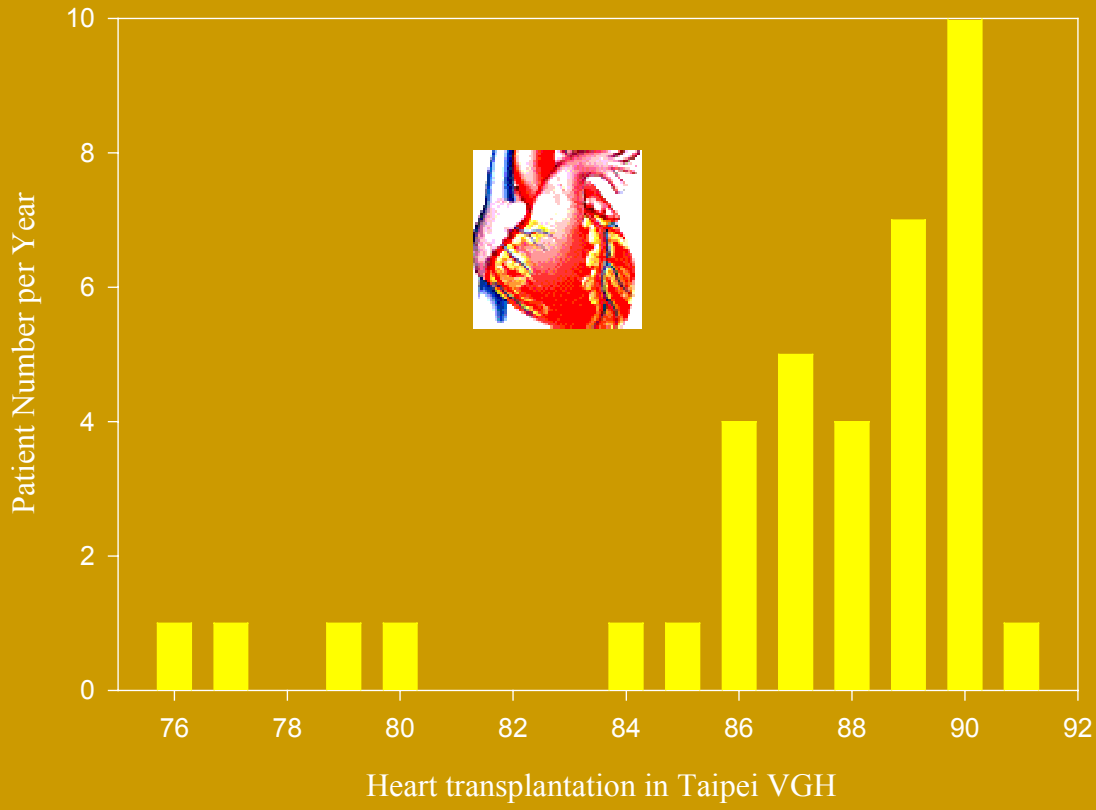


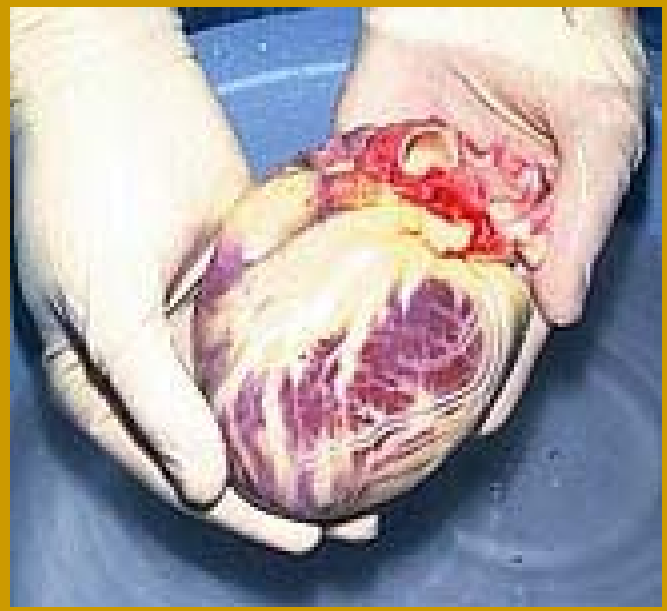




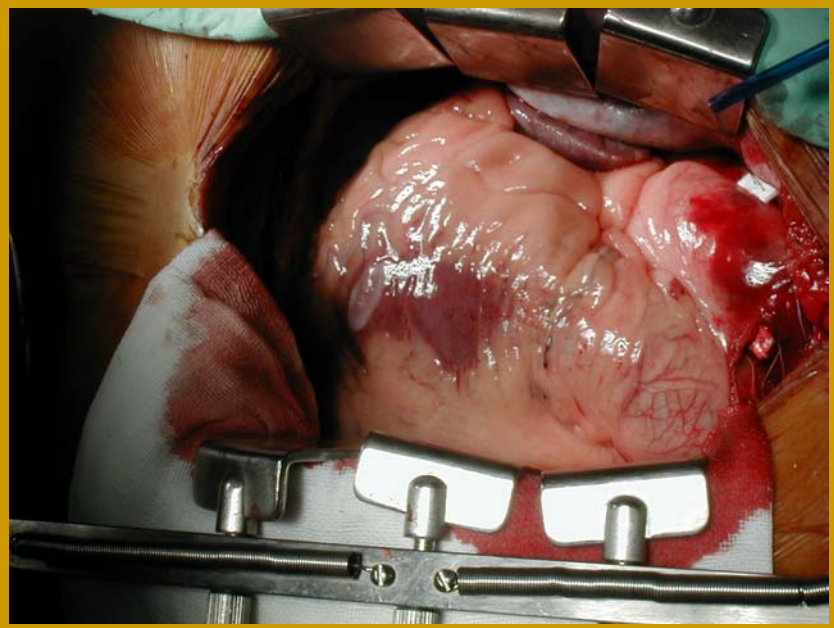


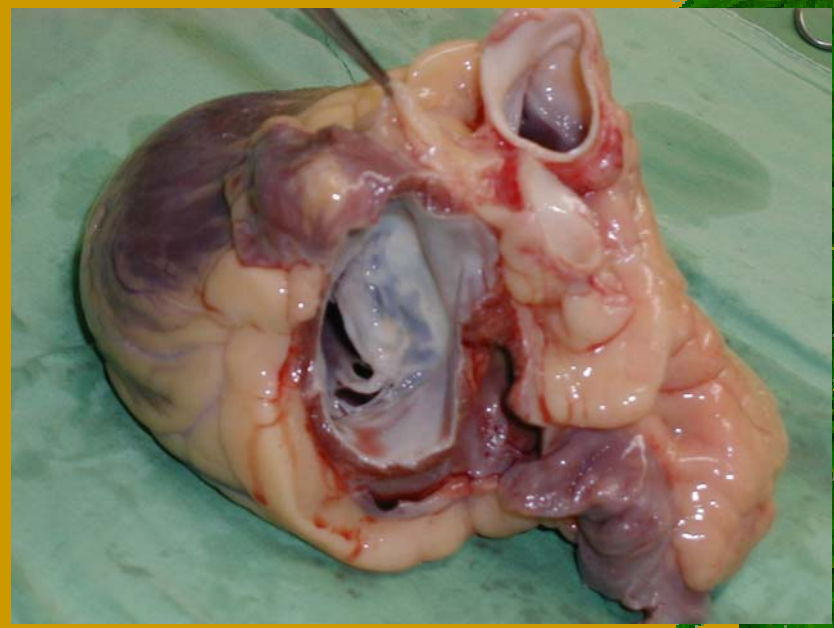
heart-surgeon.com/history.html


Patient Number per Year
0
2
4
6
8
10
76
78
80
82
84
86
88
90
92
Heart transplantation in Taipei VGH



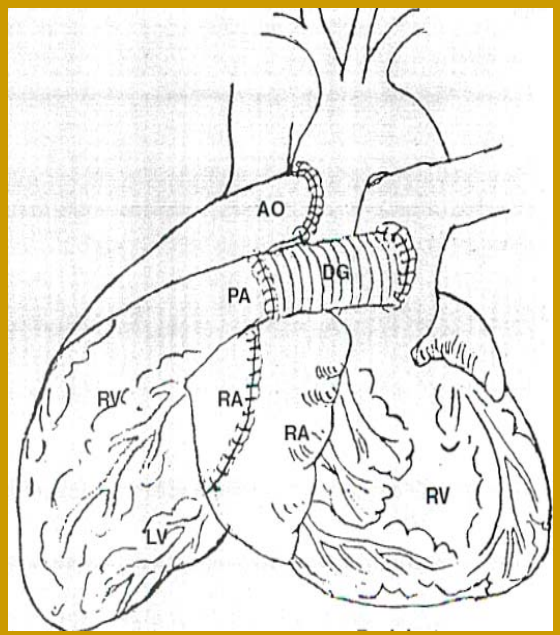
Donor heart
for
transplantation



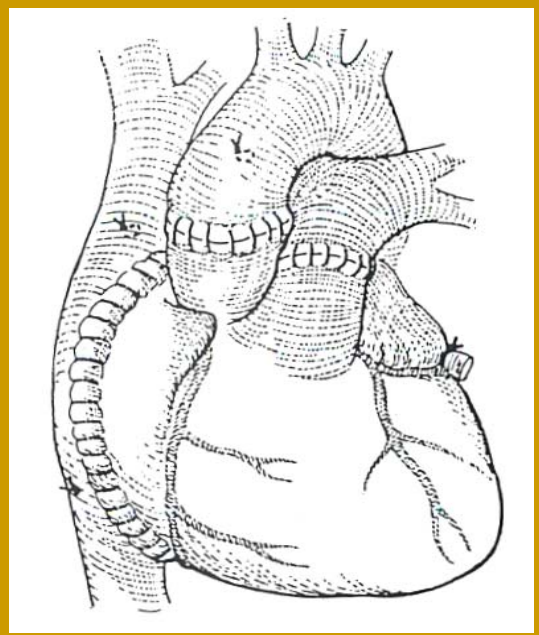


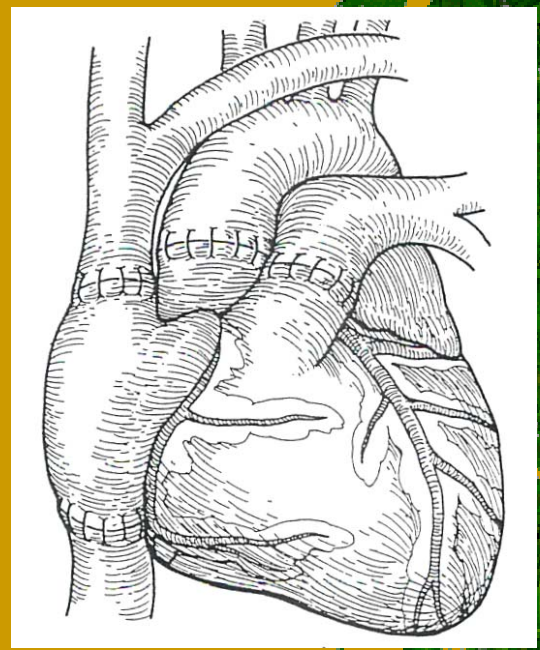
Techniques for heart transplantation

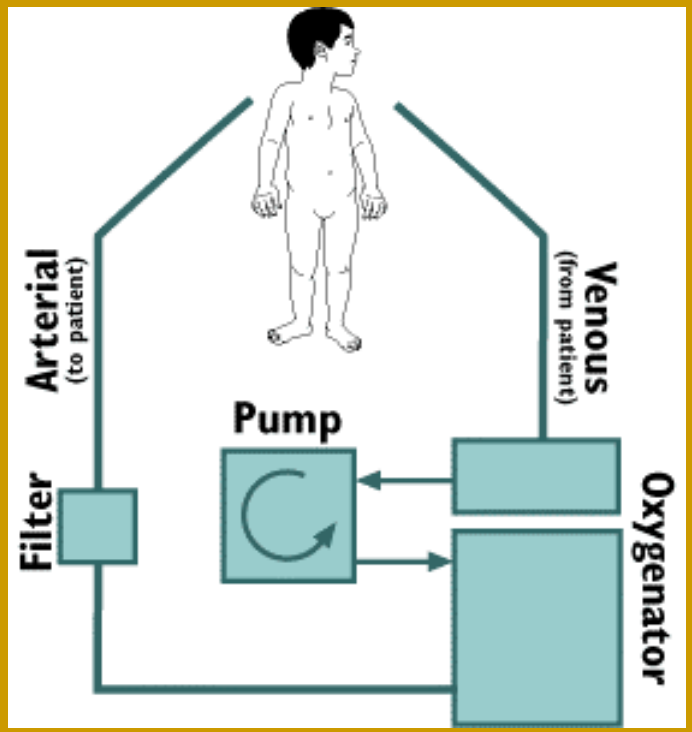
- Heterotopic:
- Orthotopic:



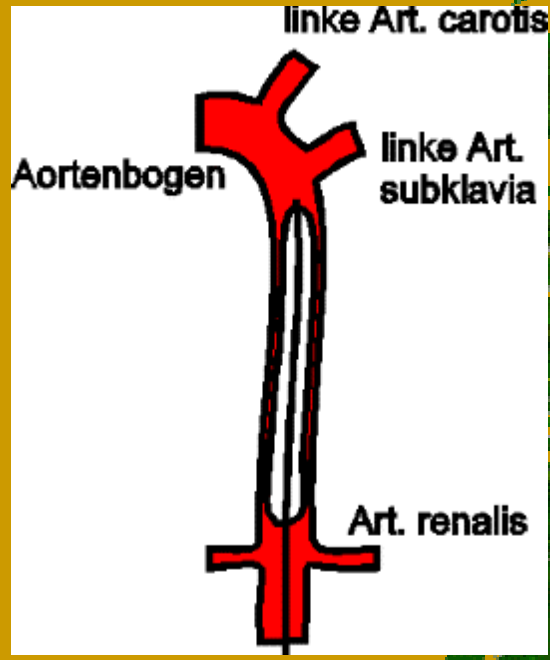
Heterotopic

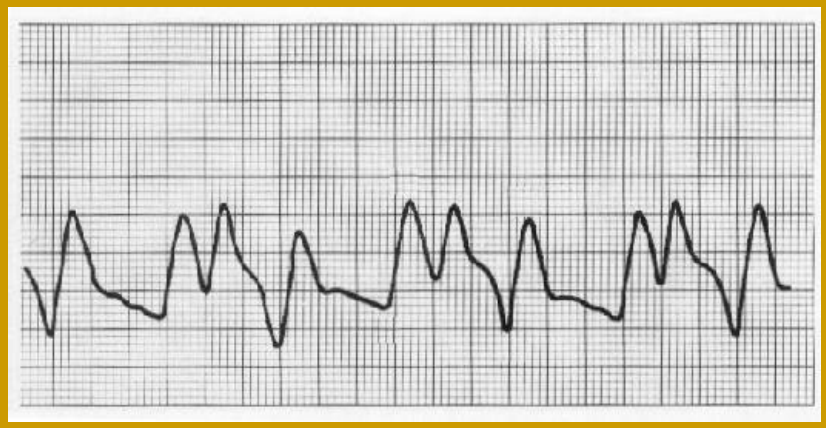

Mid-atrial

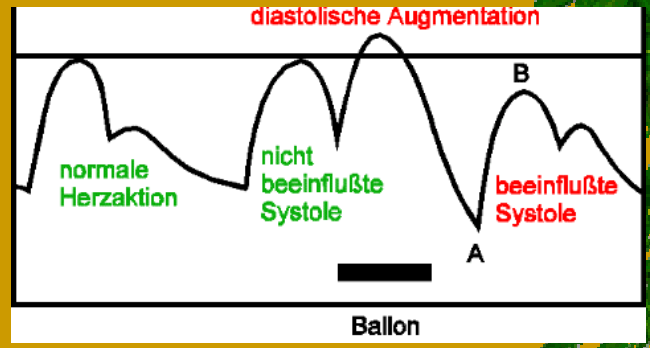

Bicaval



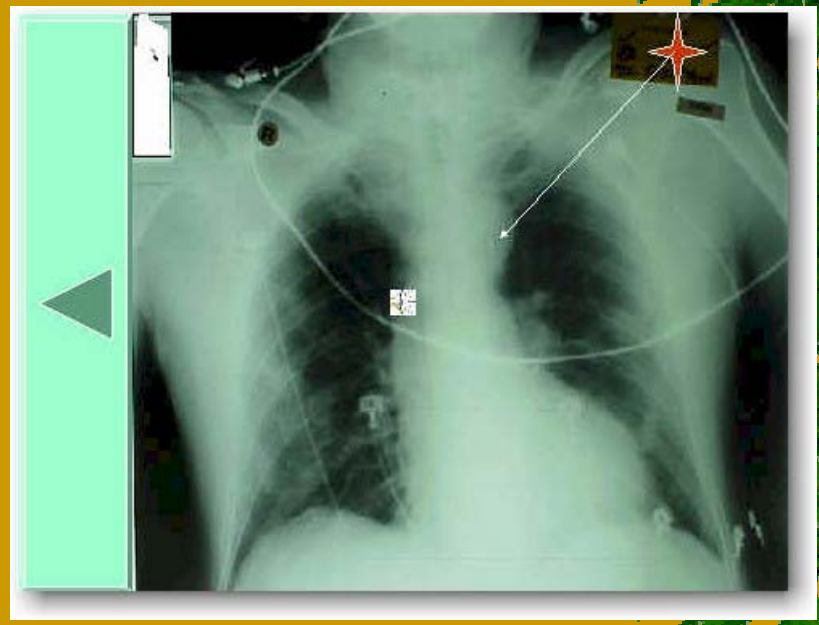
http://www.hsforum.com/stories/storyReader$1486


linke Art. carotis
Aortenbogen
linke Art. subklavia
Art. renalis

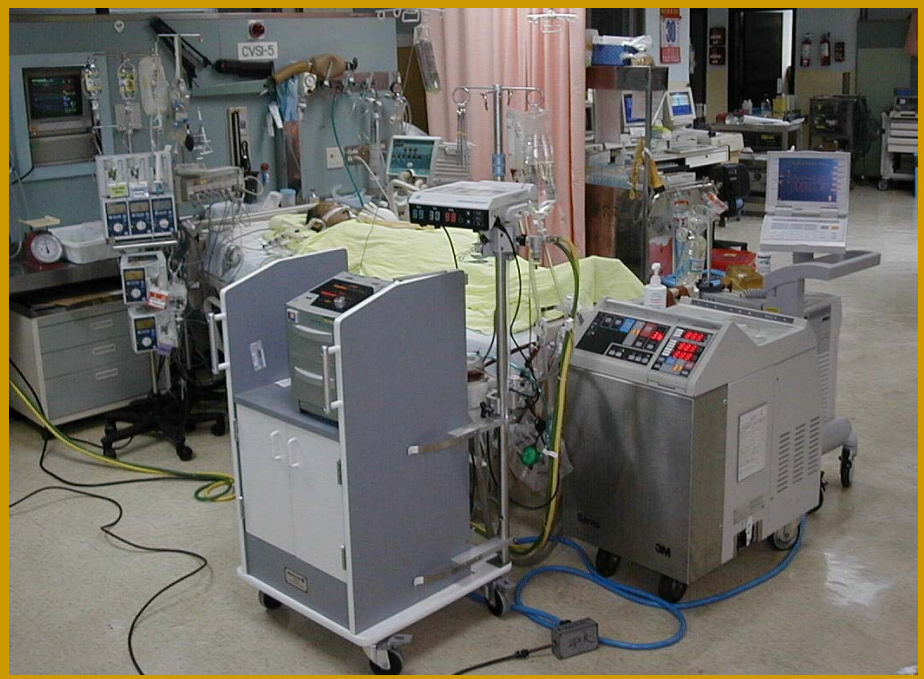



diastolische Augmentation
B
normale Herzaktion
nicht beeinflußte Systole
beeinflußte Systole
A
Ballon


100
107
61
79

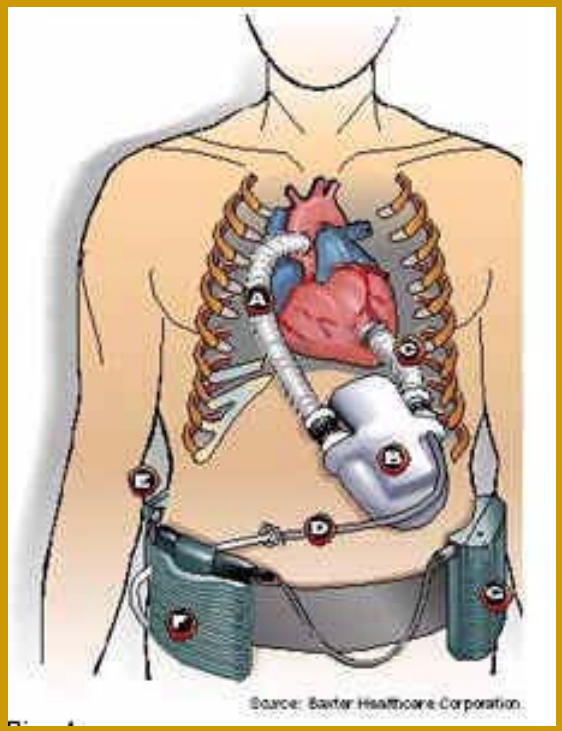


ECMO in VGH-TPE



- Since Nov 1, 1995 till Aug 15, 2001
- ECMO: 86
- Heart failure: 79
- Resp. Failure: 7

Novacor LVAS



Heart Mate LVAS

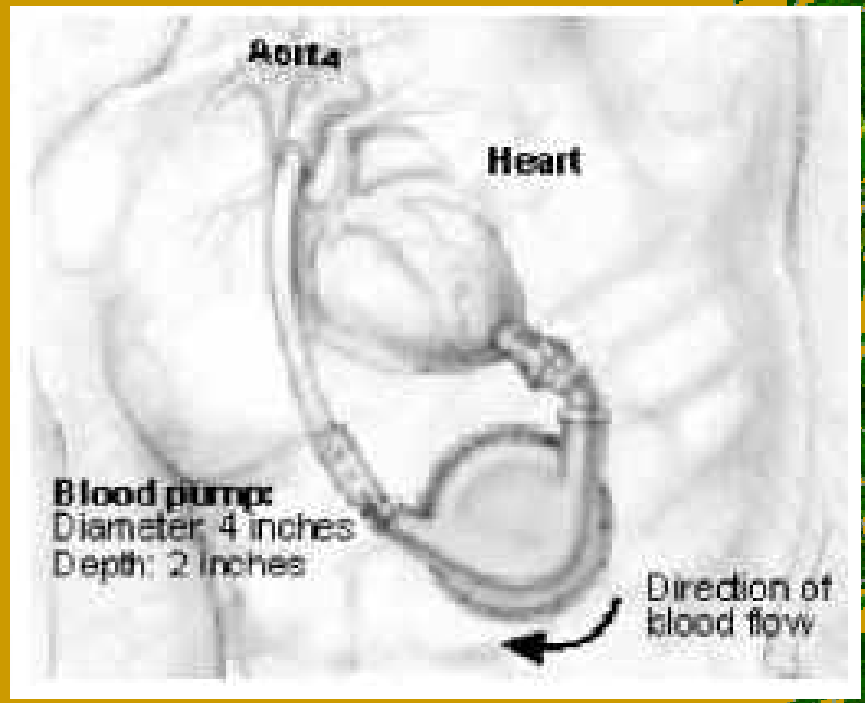


Fig. 2 *Photograph of the Liotta heart. Note the Wada-Cutter hingeless valves.*

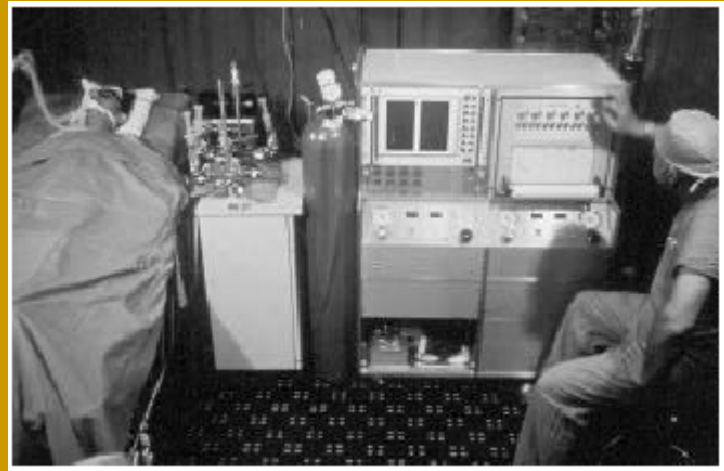


Fig. 1 *The pneumatic drive console.*

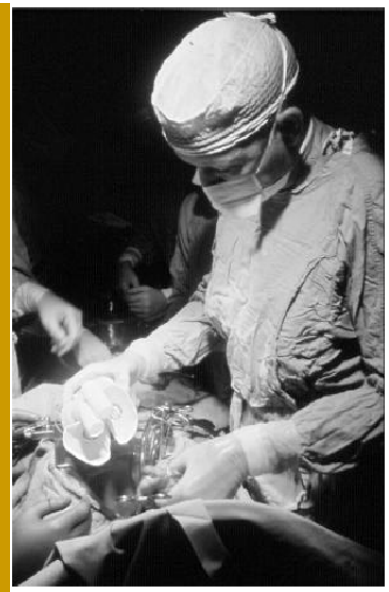
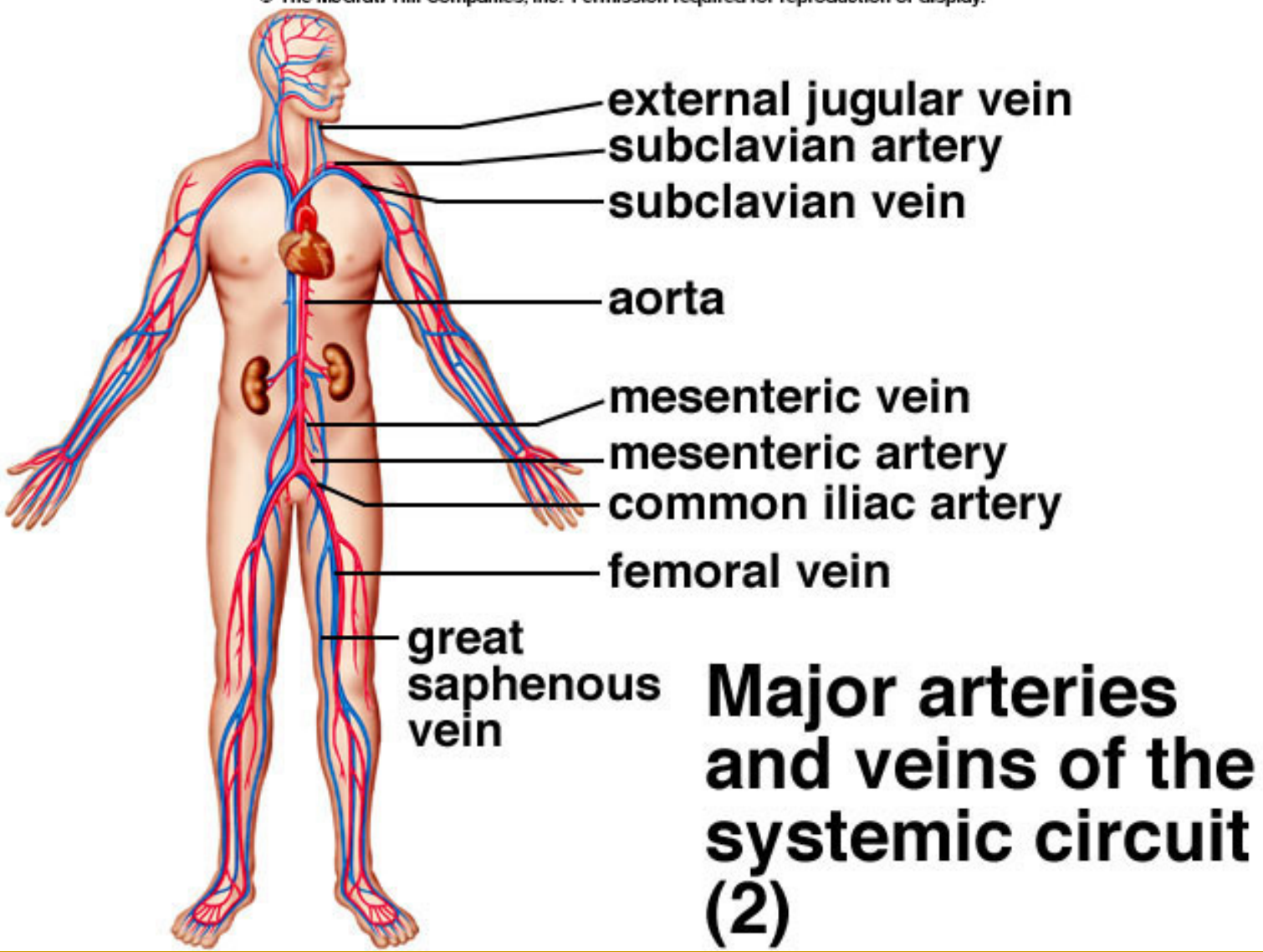
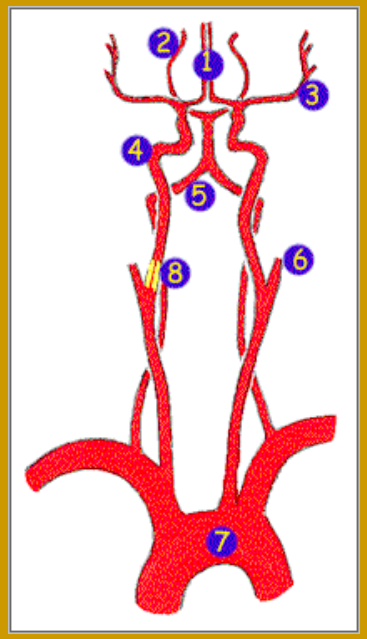


Fig. 3 *World's 1st implantation of a total artificial heart in a human being, 4 April 1969. Surgeon is Denton A. Cooley.*

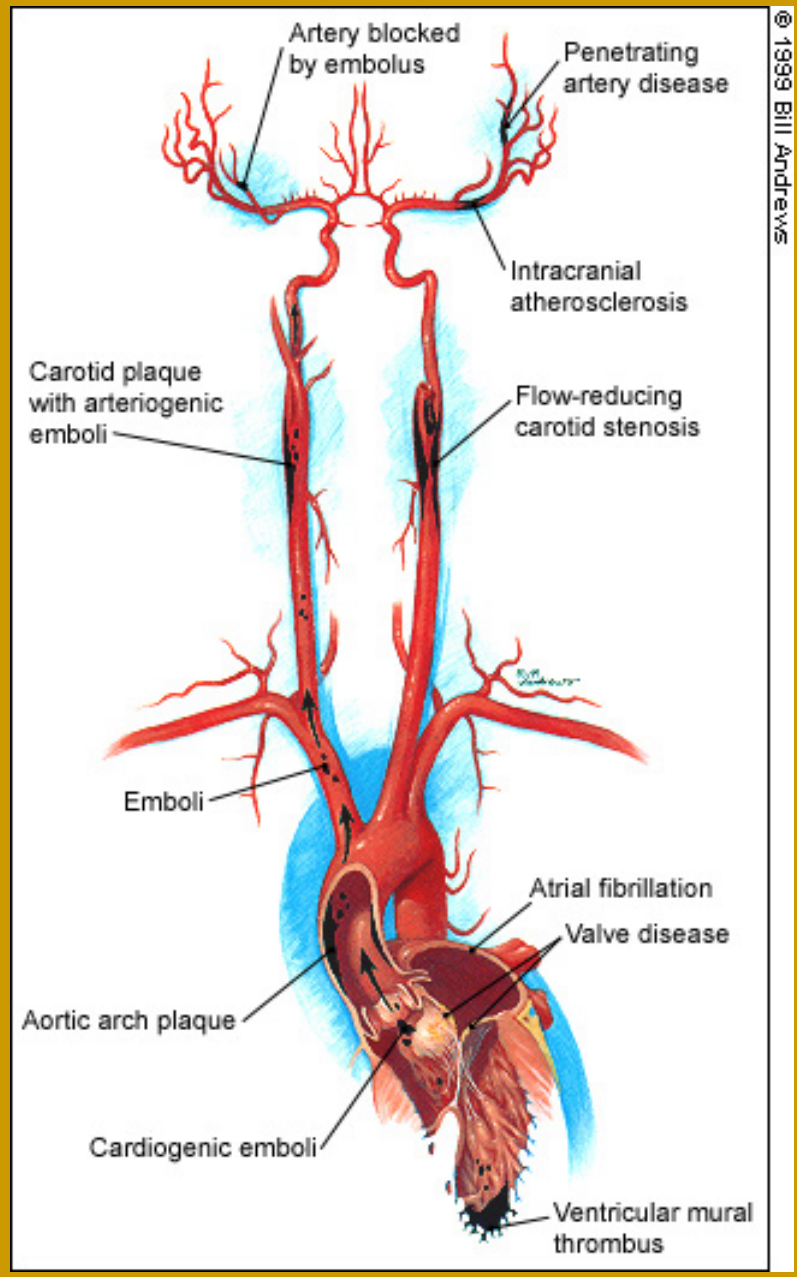


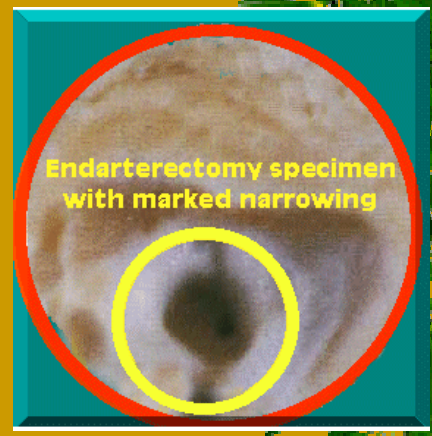
Major arteries and veins of the systemic circuit (2)



www.stroke.cwc.net/niweb/faq.htm

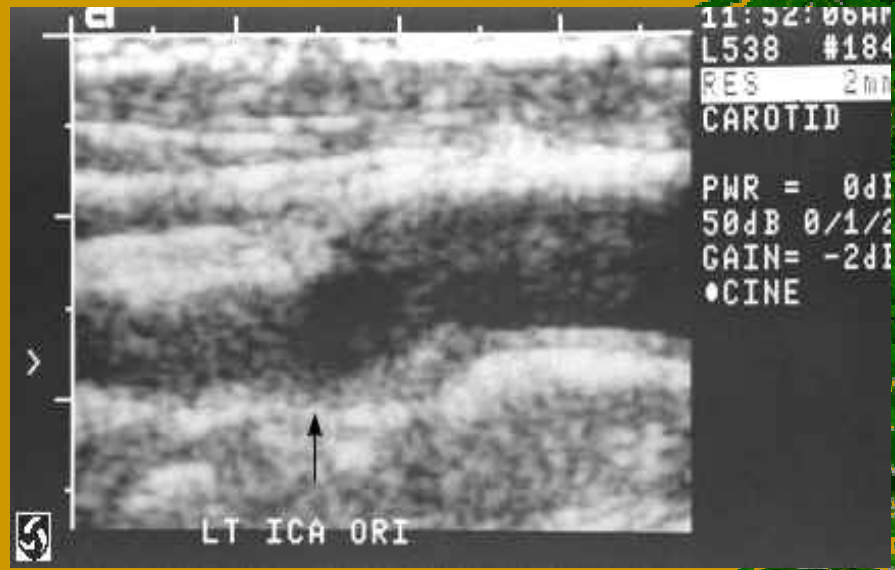
Blood vessels involved in circulation
to the brain are shown in this diagram, which shows a blockage (8)
in the right internal carotid artery (4).
The remaining arteries are :
1 = anterior cerebral artery,
2 = posterior cerebral artery,
3 = middle cerebral artery,
5 = vertebral arteries, which join together to form the basilar artery,
6 = external carotid artery,
7 = aorta.





www.stroke.cwc.net/niweb/faq.htm

Figure 1: A high resolution CE-MRA of carotid stenosis that shows vascular structure differences. A) Stenosis of internal carotid artery. B) Altered blood flow due to stenosis. C) Normal blood flow



•Mild wall thickening: left common carotid (Left); Mild wall thickening: internal carotid (right)--
Clinical Presentation: a 69-year old man presented with transient episodes of left arm weakness

NASCET method

(1-N/D) × 100 = Percent stenosis

eg, N = 2.5

D = 5.0

(1-2.5/5.0) × 100 = 50%

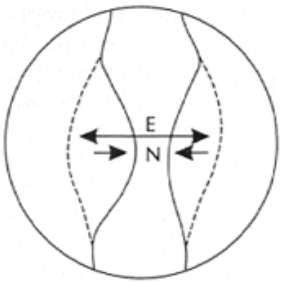
ECST method

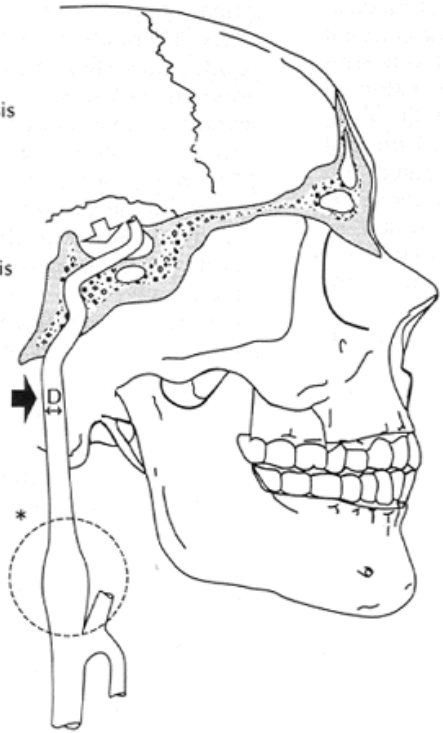
(1-N/E) × 100 = Percent stenosis

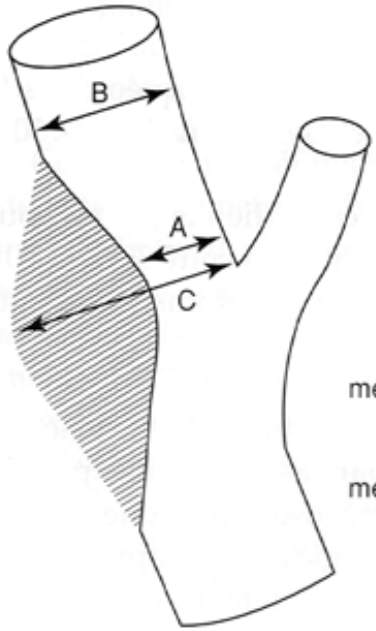
eg, N = 2.5

E = 12.0

(1-2.5/12.0) × 100 = 79%

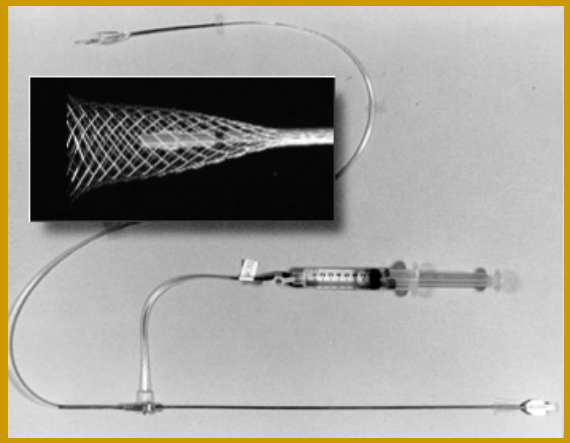




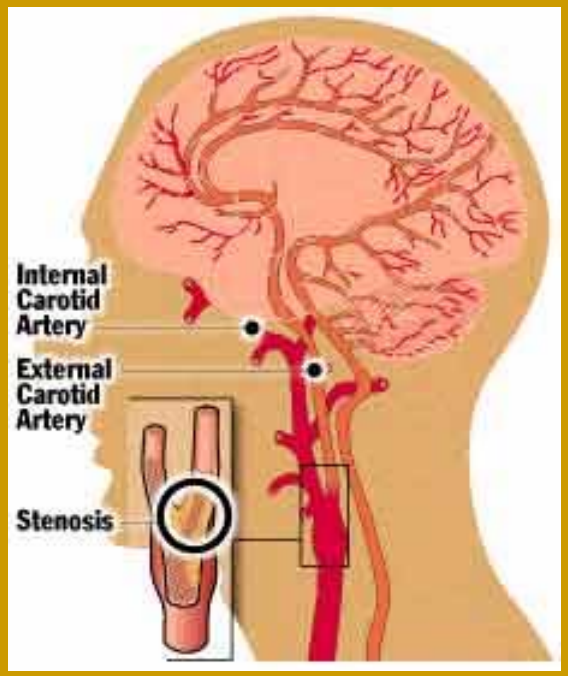


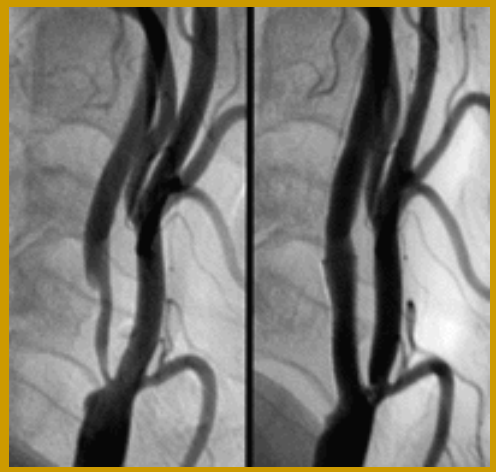
méthode ECST: $\frac{C-A}{C}$ x 100% sténoses

méthode NASCET : $\frac{B-A}{B}$ x 100% sténoses

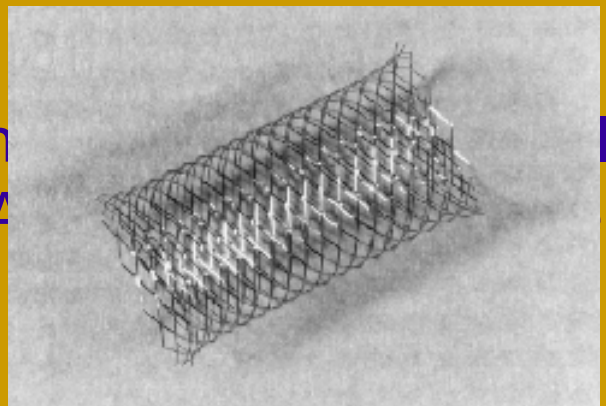


www.sunnybrook.utoronto.ca/~medimg/carotid_stent/stent2.html

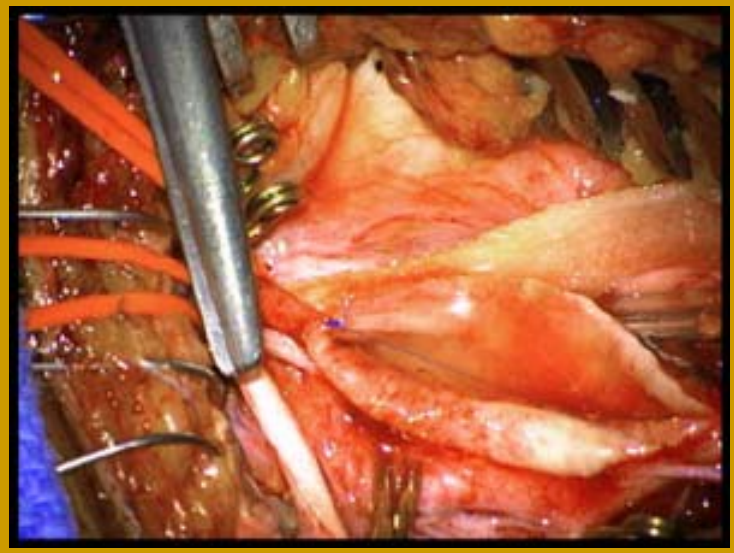




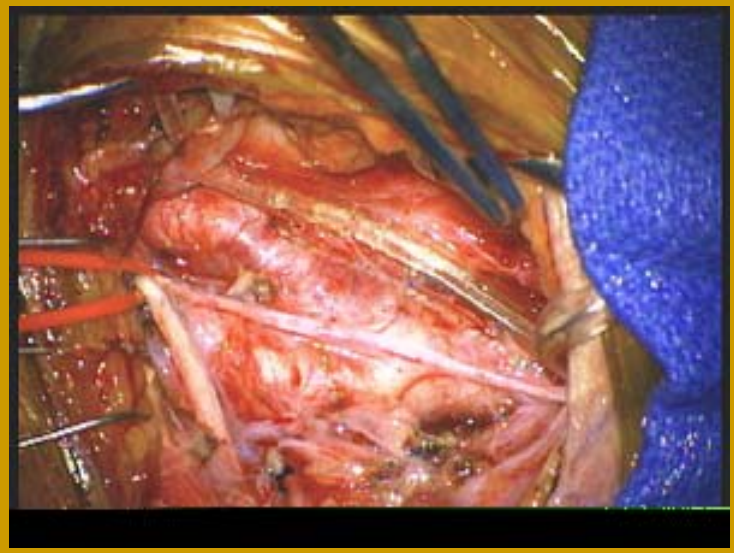
Carotid stenois occurs when plaque accumulates on the artery wall.



Successful stentin l carotid artery stenosis. A nting.



Intraoperative photo of a microsurgical carotid endarterectomy. The athero- matous plaque has been removed, and the vessel is being sutured closed.



The completed microsurgical carotid endarterectomy results in a normal appearing carotid artery without constriction. Note the closure of the vessel is barely apparent.

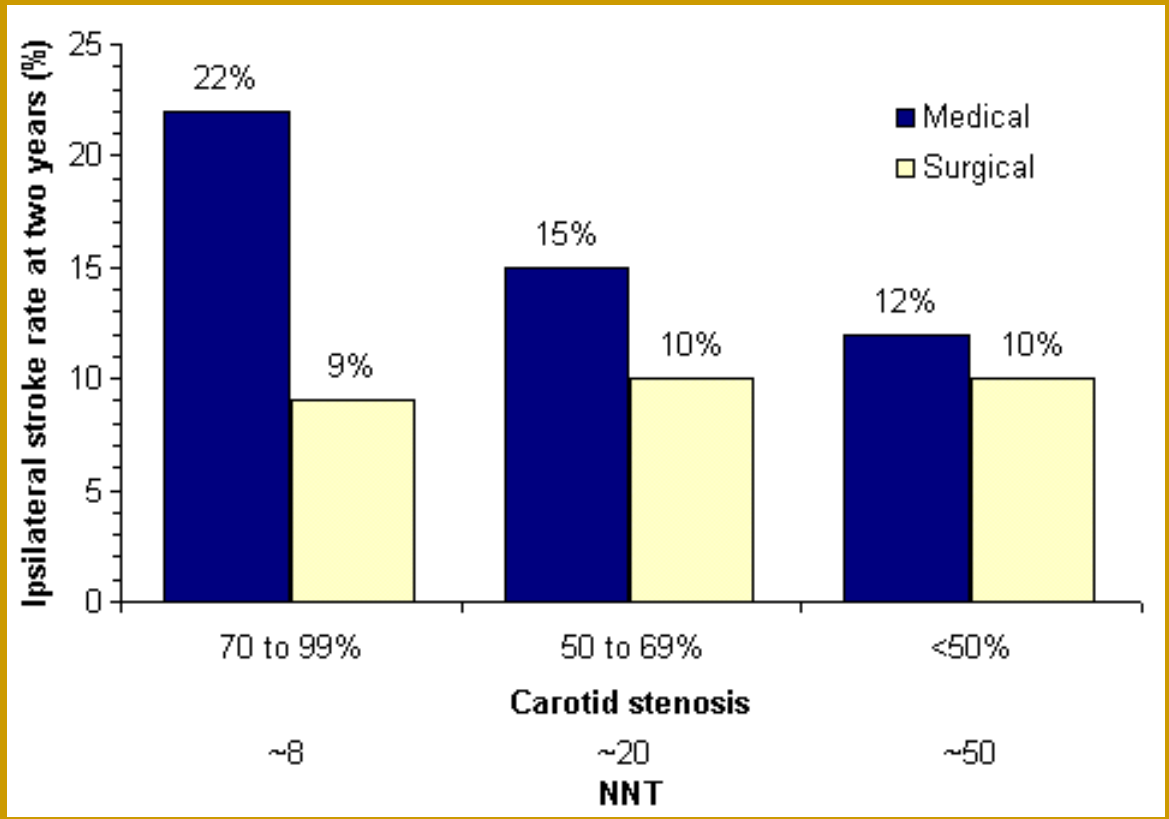
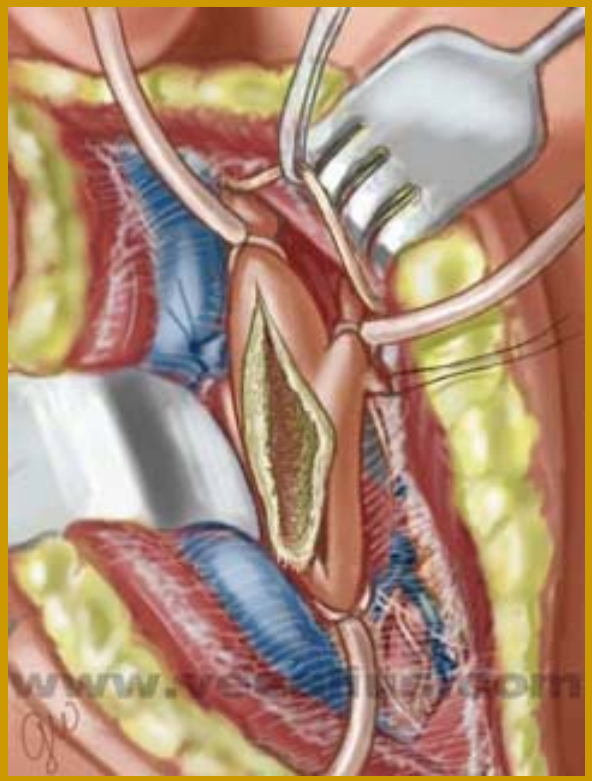


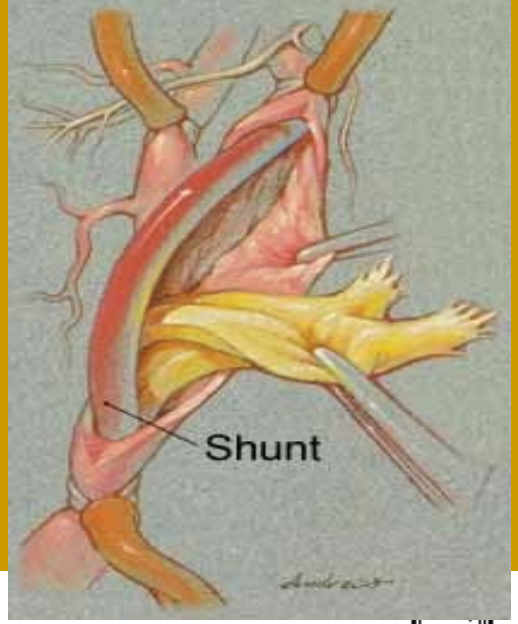
FIGURE 2. Effect of carotid endarterectomy at different degrees of symptomatic carotid stenosis in the North American Symptomatic Carotid Endarterectomy Trial. (NNT=the number-needed-to-treat with carotid endarterectomy to prevent one stroke over two years of follow-up in patients with severe stenosis [70 to 99 percent], moderate stenosis [50 to 69 percent] and mild stenosis [less than 50 percent])

N Engl J Med 1991;325:445-53

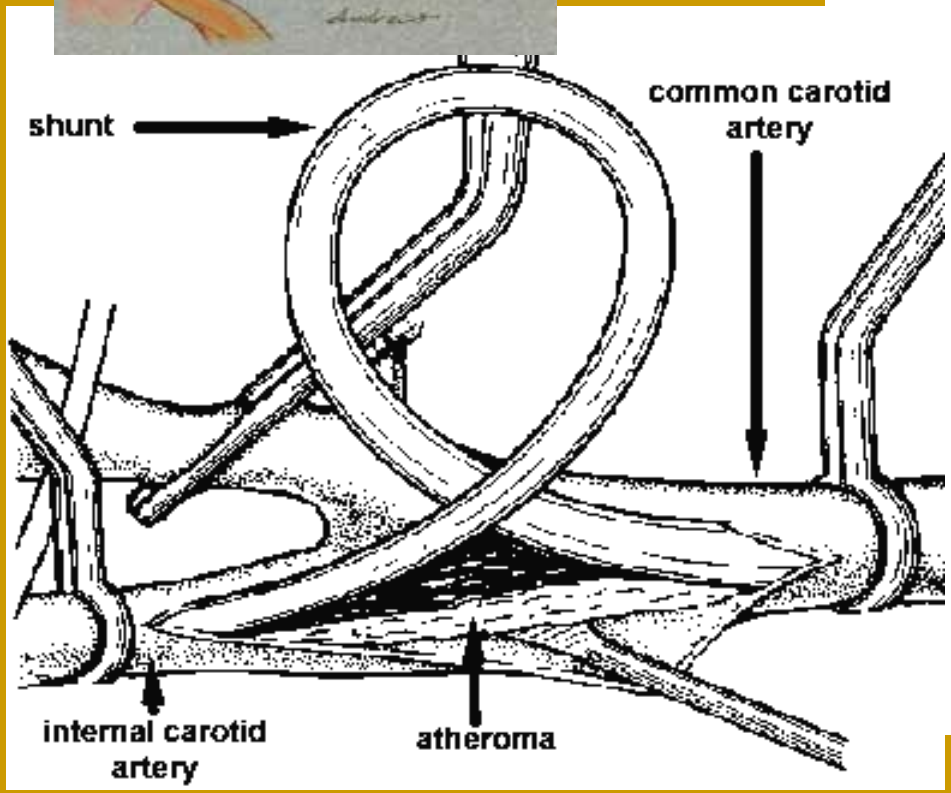
N Engl J Med 1998;339:1415-25.



http://www.pharmacology2000.com/Cardio/Cardio_risk/risk4.htm



Corotid Endarterectomy—
Patch Repair



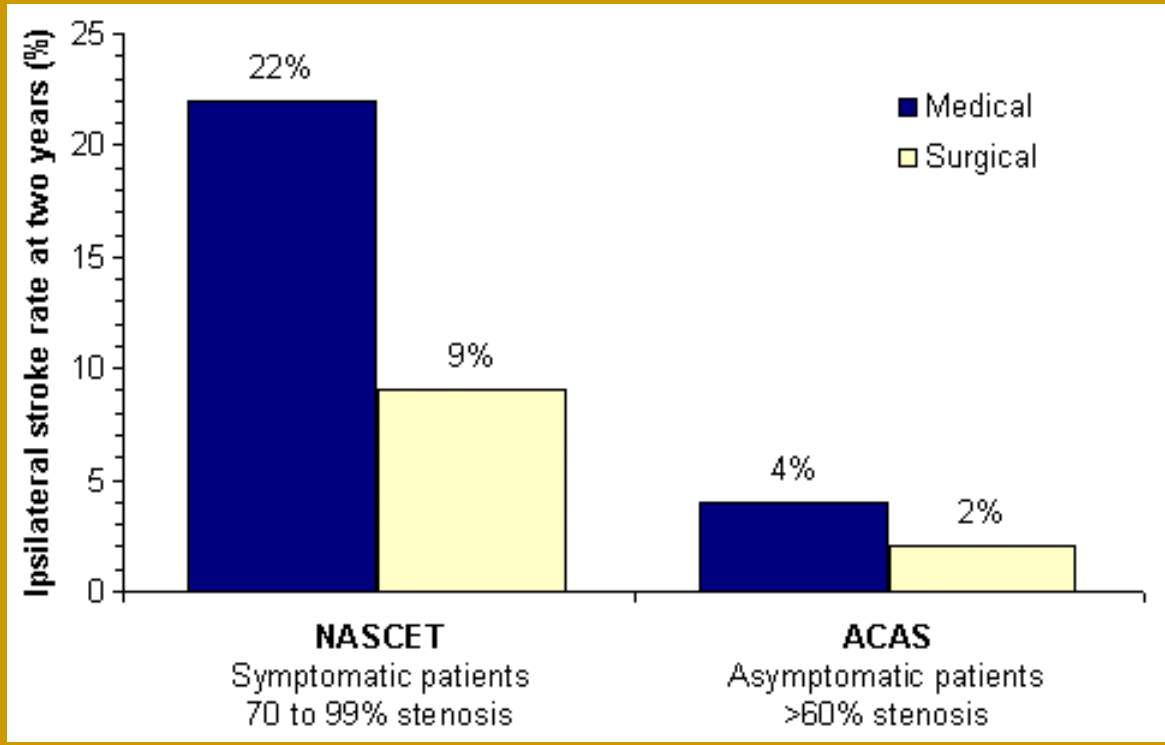
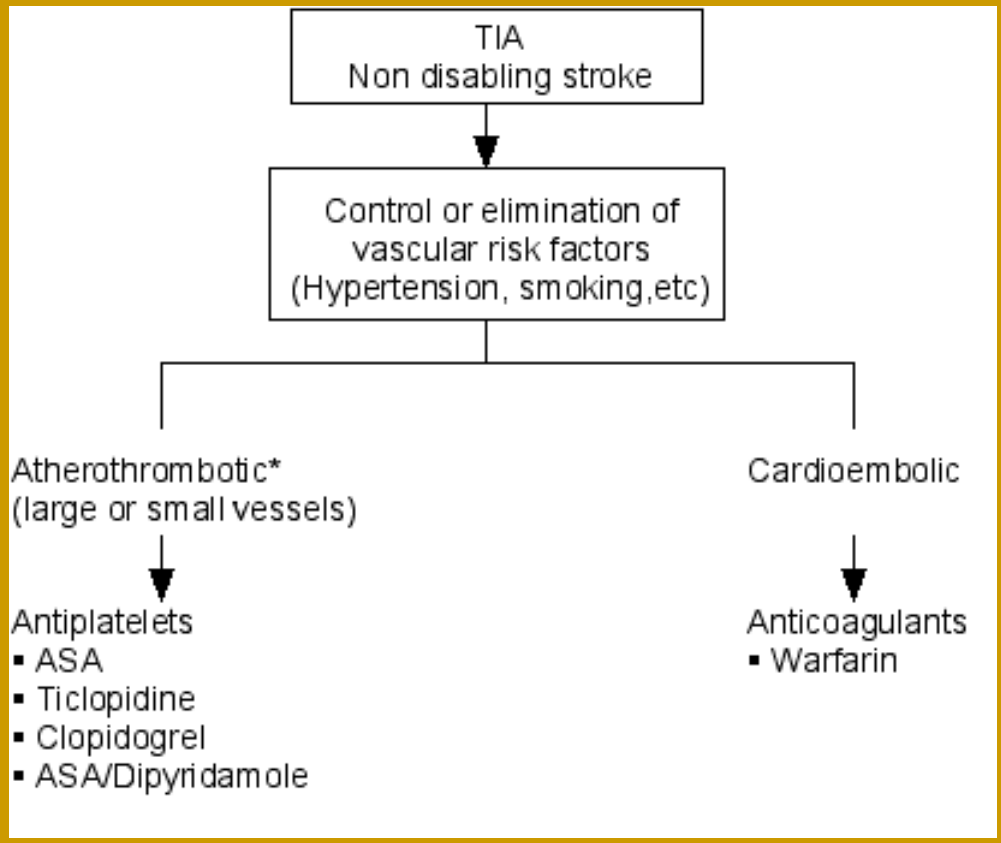


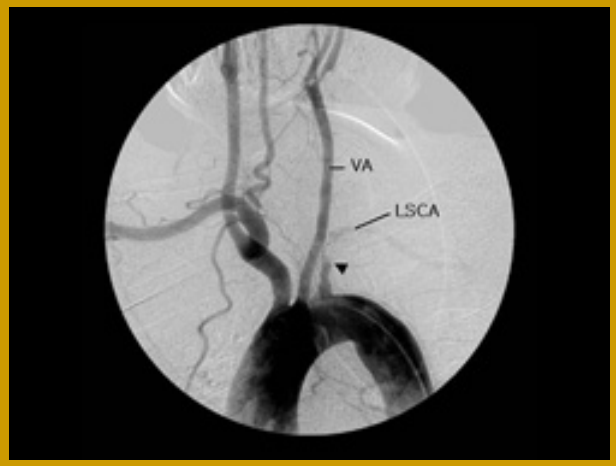
FIGURE 3. Carotid endarterectomy in carotid stenosis: rate reductions in ipsilateral stroke comparing symptomatic and asymptomatic patients. Although relative risk reductions are similar, absolute risk reductions are much greater for symptomatic patients (the number-needed-to treat with surgery to prevent one stroke over two years is about eight for symptomatic patients compared with about 50 for asymptomatic patients). (NASCET=North American Symptomatic Carotid Endarterectomy Trial; ACAS=Asymptomatic Carotid Atherosclerosis Study)

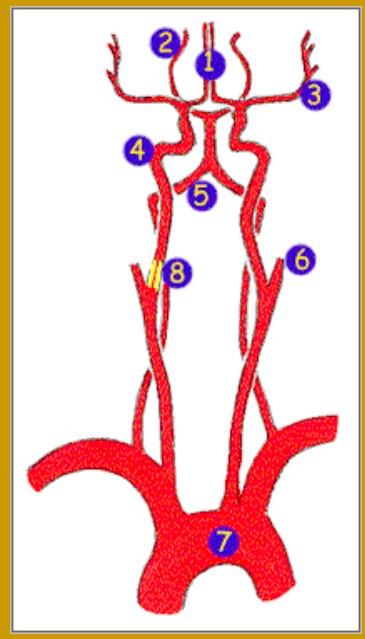
N Engl J Med 1991;325:445-53.

N Engl J Med 1998;339:1415-25.

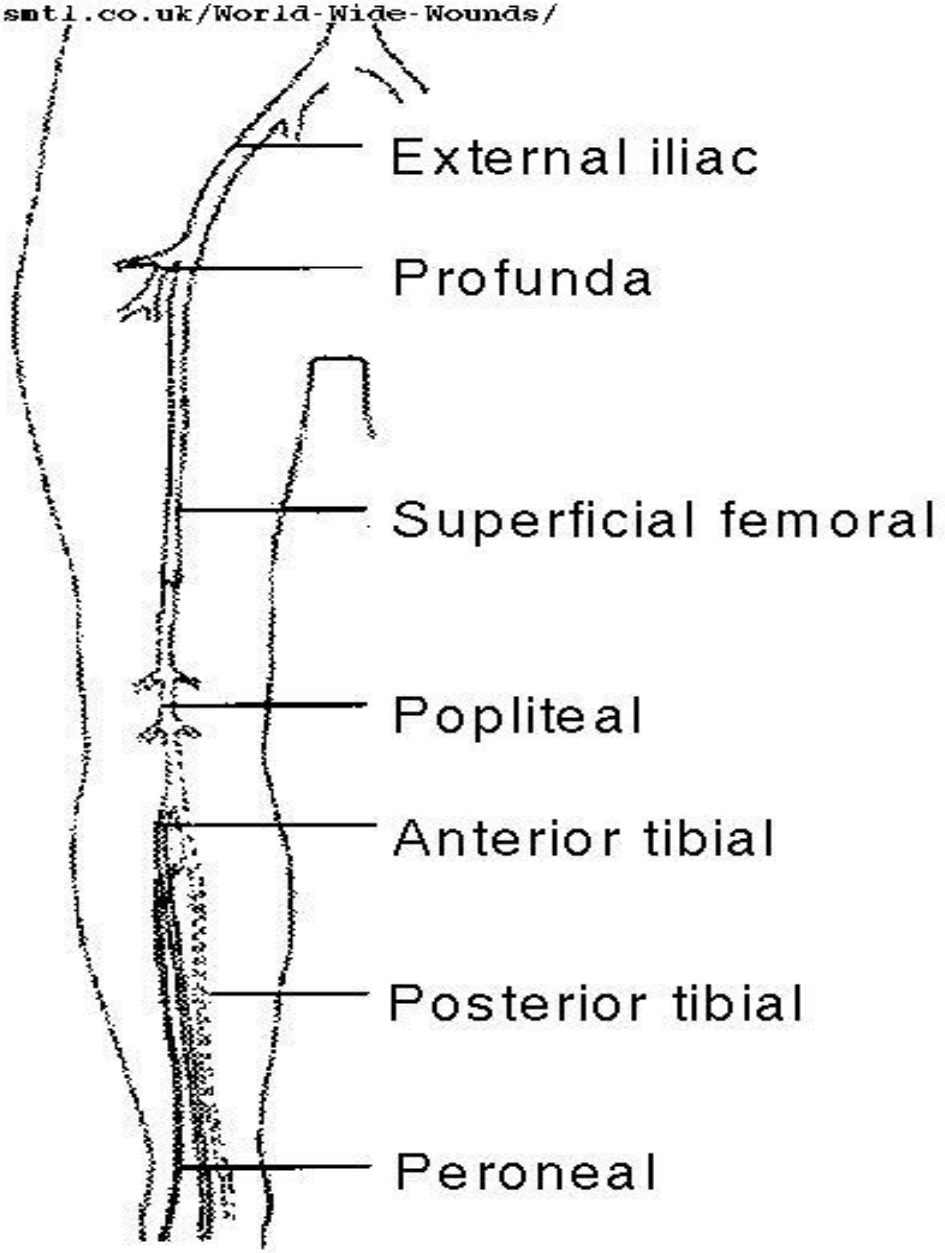
JAMA 1995; 273:1421-8.

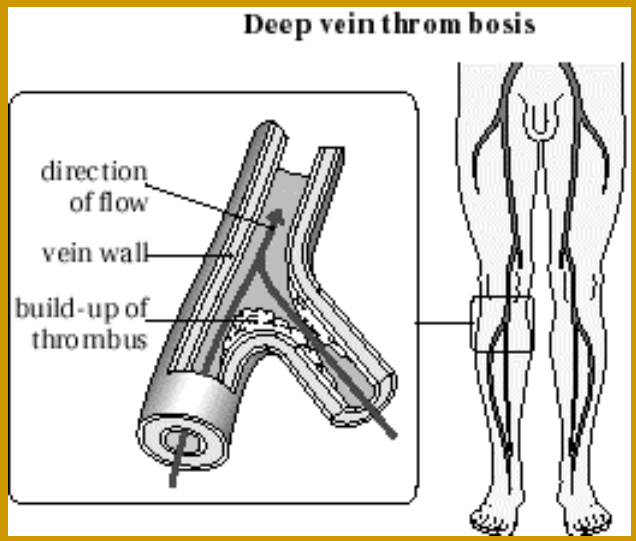

TIA
Non disabling stroke
Control or elimination of vascular risk factors (Hypertension, smoking,etc)
Atherothrombotic*
(large or small vessels)
Cardioembolic
Antiplatelets
▪ ASA
▪ Ticlopidine
▪ Clopidogrel
▪ ASA/Dipyridamole
Anticoagulants
▪ Warfarin

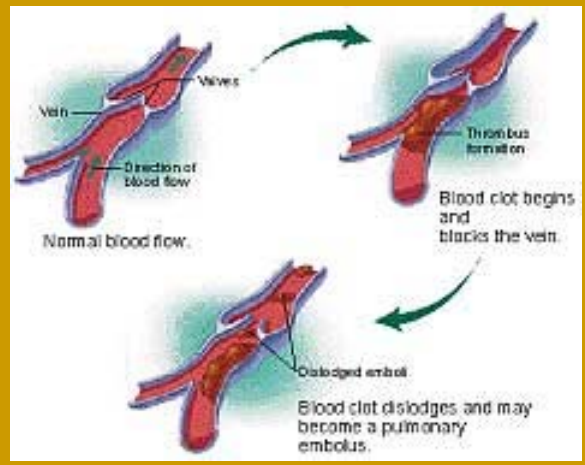


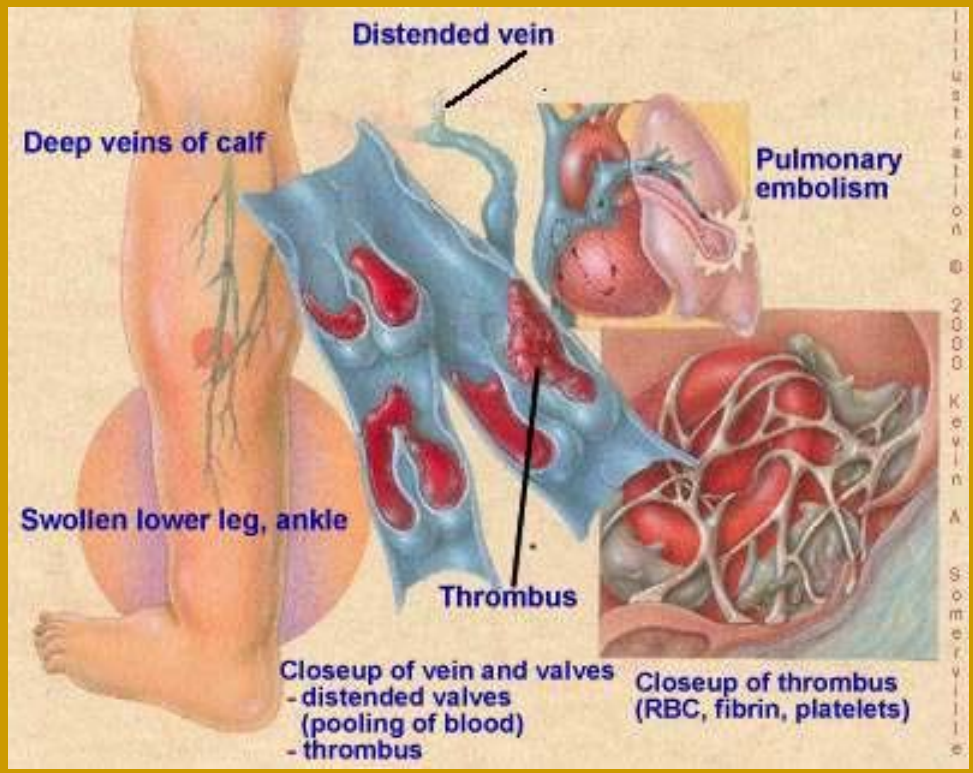


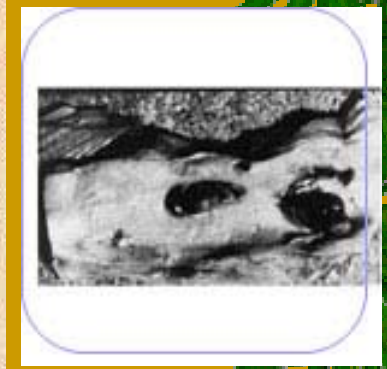
SSS

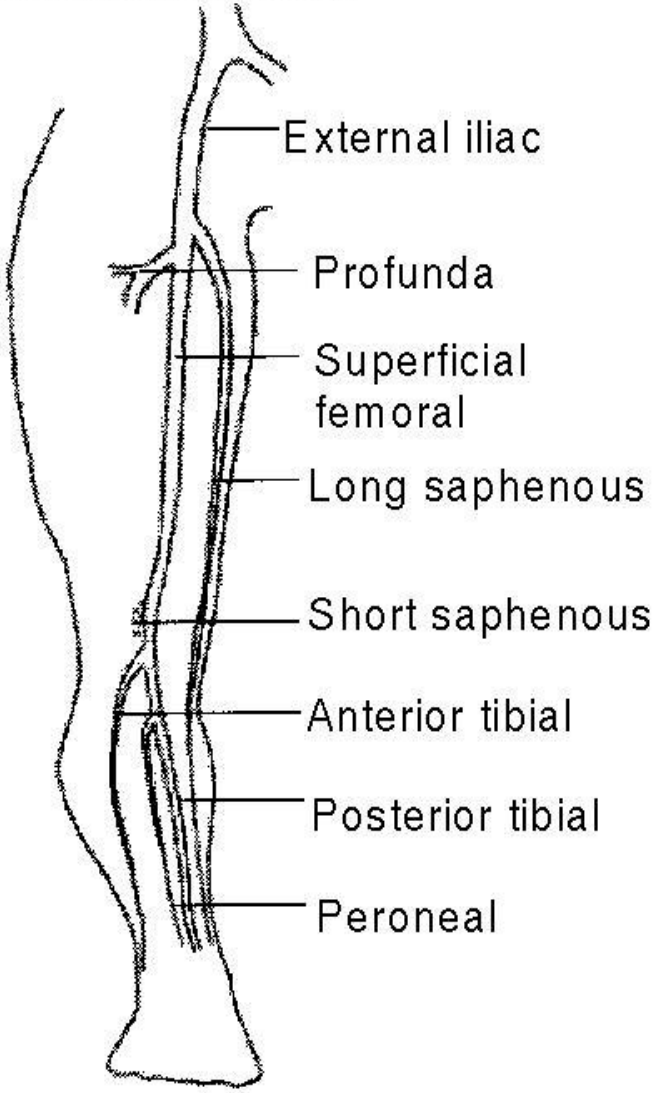


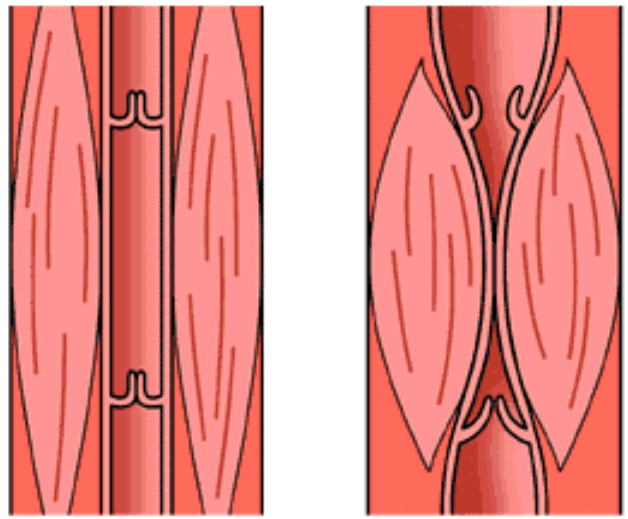

Deep vein thrombosis
direction of flow
vein wall
build-up of thrombus


Valves
Vein
Direction of blood flow
Normal blood flow.
Thrombus formation
Blood clot begins and blocks the vein.
Dislodged emboli
Blood clot dislodges and may become a pulmonary embolus.

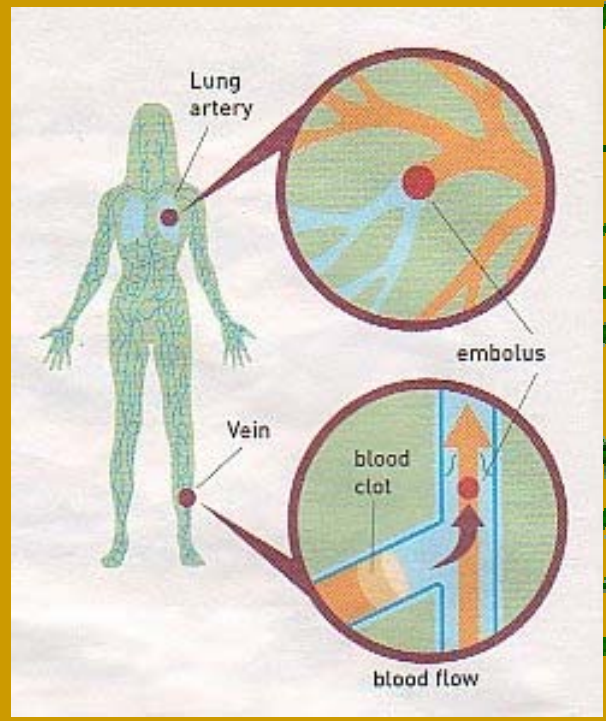

Distended vein
Deep veins of calf
Pulmonary embolism
Swollen lower leg, ankle
Thrombus
Closeup of vein and valves
- distended valves
(pooling of blood)
- thrombus
Closeup of thrombus
(RBC, fibrin, platelets)
Illustration © 2000 Kevin A Somerville

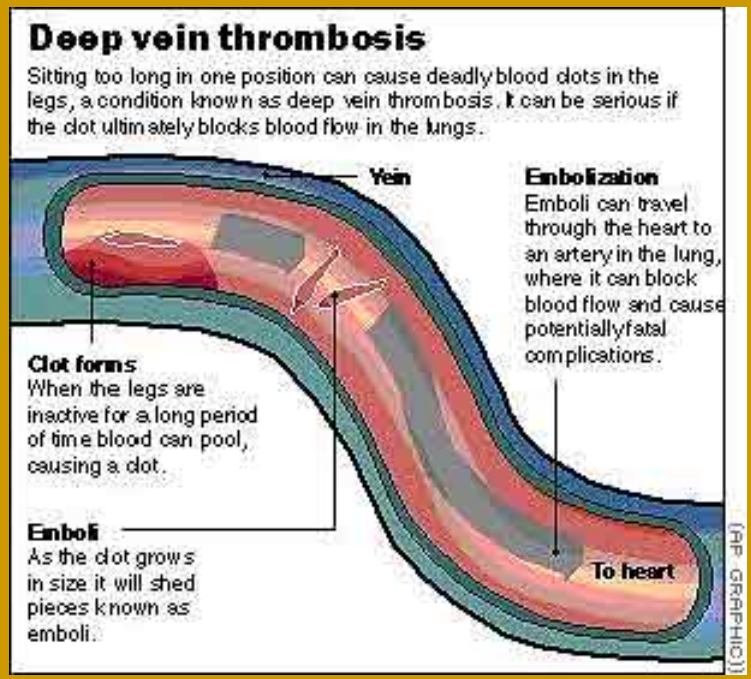






Blood is propelled back to the heart by the changes in shape of calf muscles as the leg moves

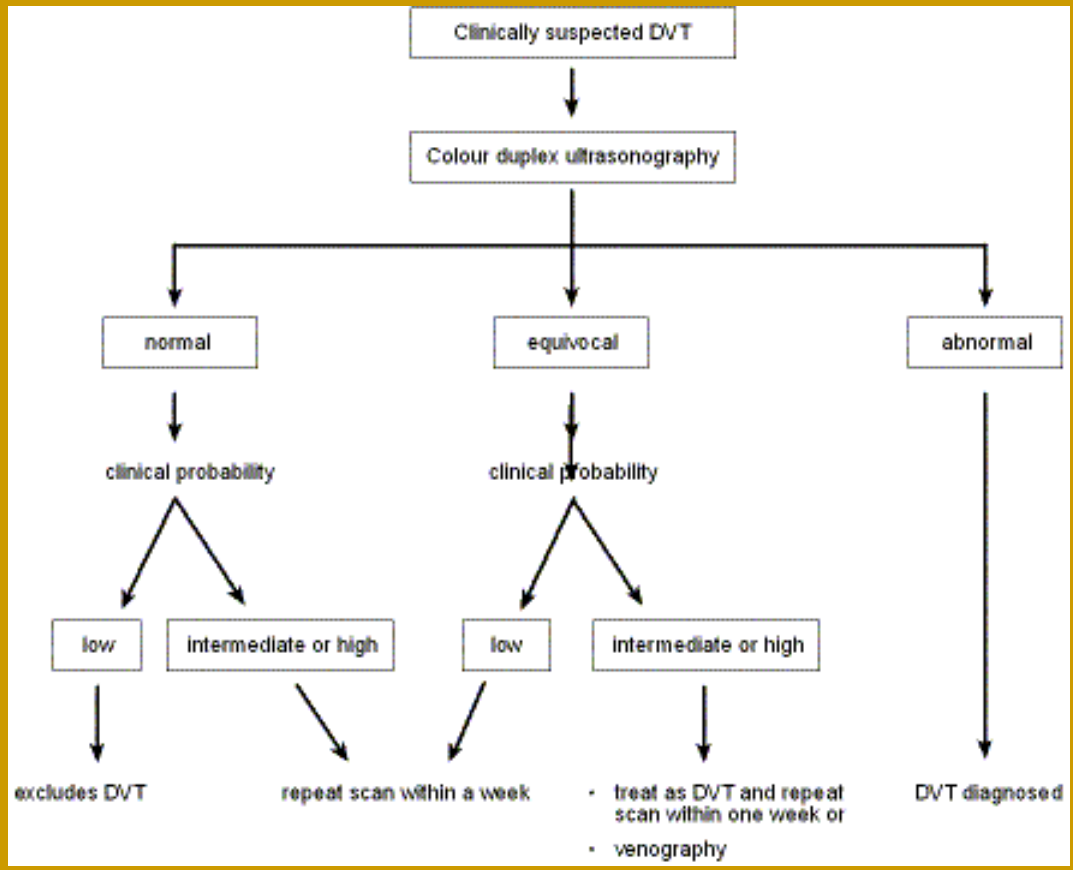

Lung
artery
embolus
Vein
blood
clot
blood flow

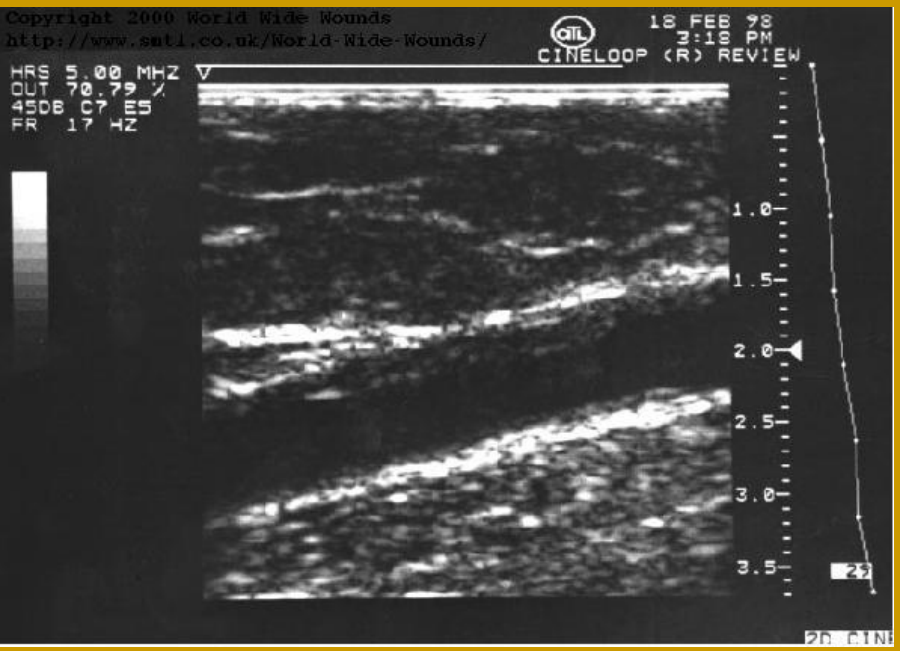

Deep vein thrombosis
Sitting too long in one position can cause deadly blood clots in the legs, a condition known as deep vein thrombosis. It can be serious if the clot ultimately blocks blood flow in the lungs.
Vein
Embolization
Emboli can travel through the heart to an artery in the lung, where it can block blood flow and cause potentially fatal complications.
Clot forms
When the legs are inactive for a long period of time blood can pool, causing a clot.
Emboli
As the clot grows in size it will shed pieces known as emboli.
To heart
(AP GRAPHICS)

A 16 year-old patient presented with acute pain in his right thigh. The thigh was inflamed and swollen (10 cm difference in diameter from the left thigh). Ultrasonography (Doppler bimode) showed occlusion of the deep femoral vein extending to the level of the groin. Local thrombolytic treatment with urokinase (Ukidan) followed by μMBH in therapeutic dosage led to recanalization of the venous network. Complete investigation of the young man's hemostatic mechanism revealed that he is a heterozygote for the mutation of the V-Leiden product.

Swelling and discoloration of the leg is a sign of Deep Vein Thrombosis

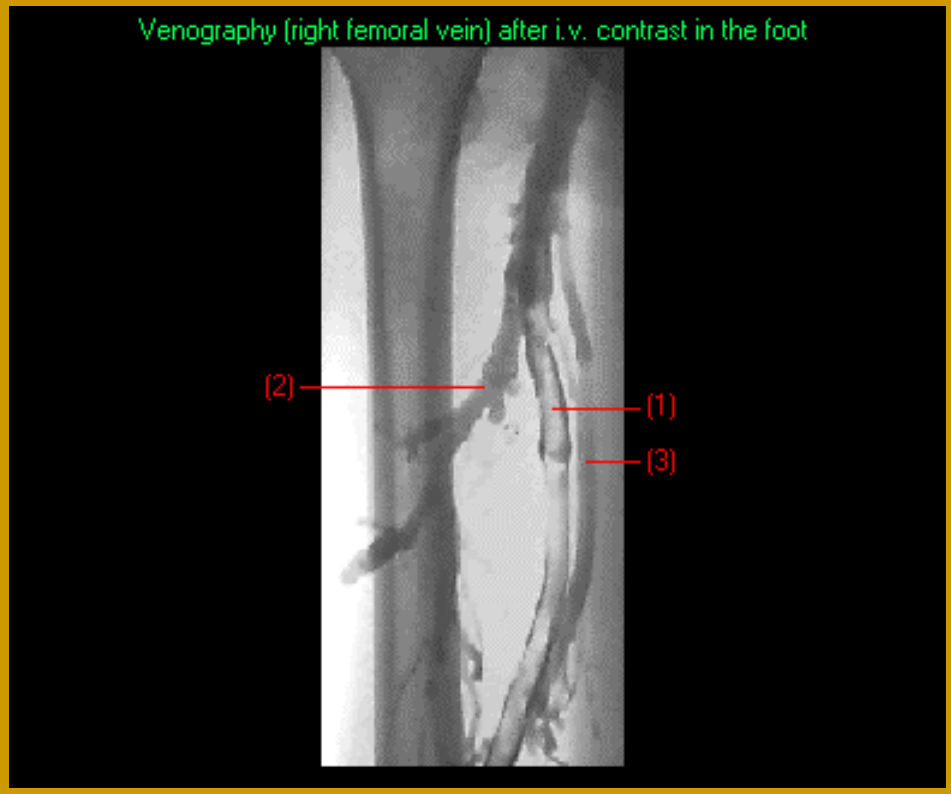
A Blood Clot that travels to the lungs may be fatal without immediate emergency treatment


Clinically suspected DVT
Colour duplex ultrasonography
normal
equivocal
abnormal
clinical probability
clinical probability
low
intermediate or high
low
intermediate or high
excludes DVT
repeat scan within a week
• treat as DVT and repeat scan within one week or
• venography
DVT diagnosed


Copyright 2000 World Wide Wounds
http://www.smtl.co.uk/World-Wide-Wounds/
18 FEB 98
3:18 PM
CINELOOP (R) REVIEW
HRS 5.00 MHZ
OUT 70.79 %
45DB C7 E5
FR 17 HZ
1.0
1.5
2.0
2.5
3.0
3.5
25


THROMBUS


Copyright 2000 World Wide Wounds
http://www.smi.co.uk/World-Wide-Wounds/
HRS 5.00 MHZ
CUT 70.79 /
45DB 07 E5
FR 16 HZ
18 FEB 98
3:22 PM
CINELOOP (R) REVIEW
SFV
SFA
3.0
3.5
4.0
4.5
RT SFV WITH PRESSURE



1) Clot within the right femoral vein
(2) Deep femoral vein
(3) Great saphenous vein

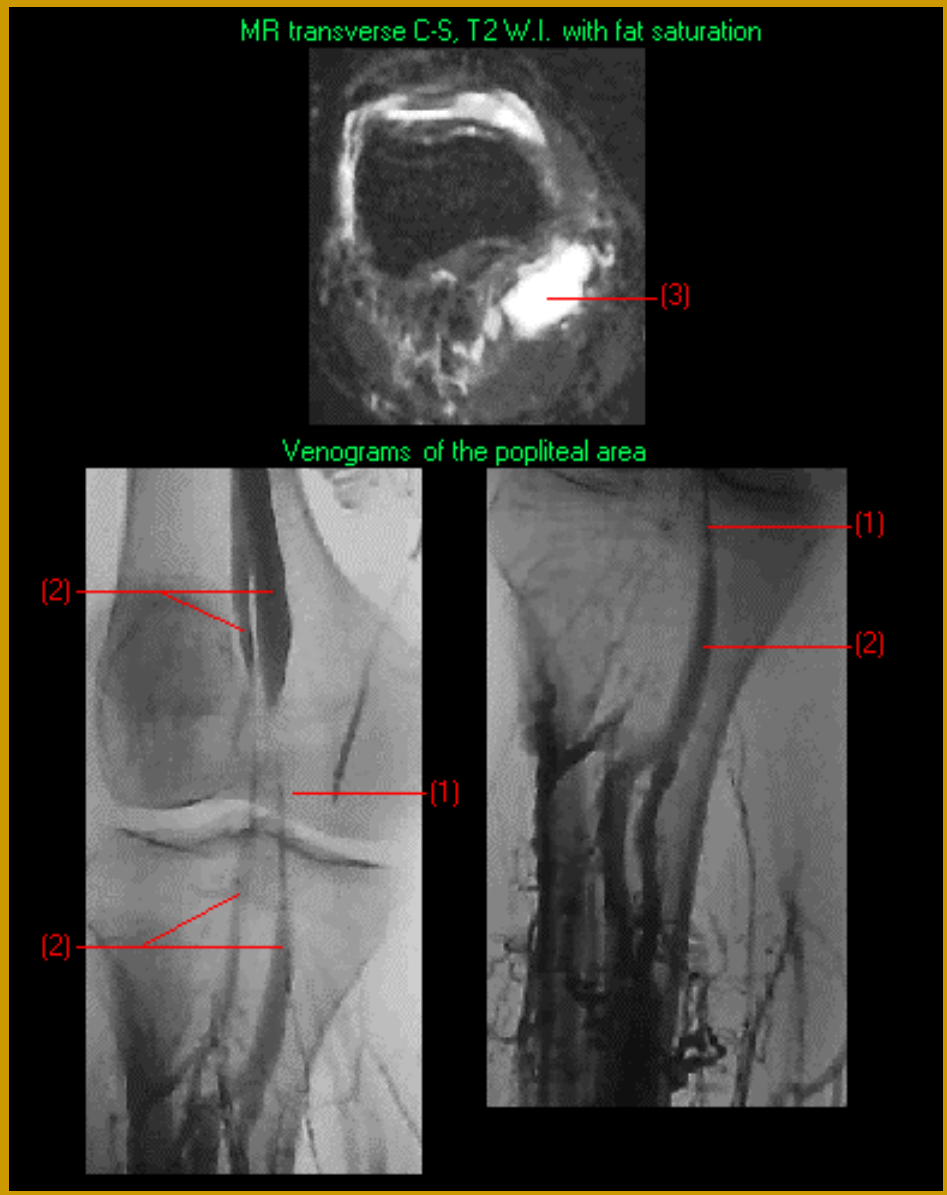

MR transverse C-S, T2 W.I. with fat saturation
(3)
Venograms of the popliteal area
(2)
(1)
(2)
(1)
(2)

Table 2
Summary of Anticoagulation Therapy for DVT

Day 1 Objective pending confirmation
1. Heparin 5000 IU IV

Day 1 DVT confirmed by objective methods
HEPARIN
1. Heparin 80 IU/kg IV bolus
2. Heparin 18 IU/kg/hr IV infusion
3. Heparin infusion adjusted based on steady state APTT results
4. Warfarin 5 mg PO

OR **ENOXAPARIN**
1. Enoxaparin 1mg/kg sq ql2h or enoxaparin 1.5mg/kg sqQ24h (hospitalized patients only)
2. Warfarin 5 mg PO

Days 2,3,4
HEPARIN
1. Adjust heparin dose based on steady state APTT results (goal is 1.5–2.3 times control)
2. Adjust warfarin dose based on INR results
(goal is 2.0–3.0)

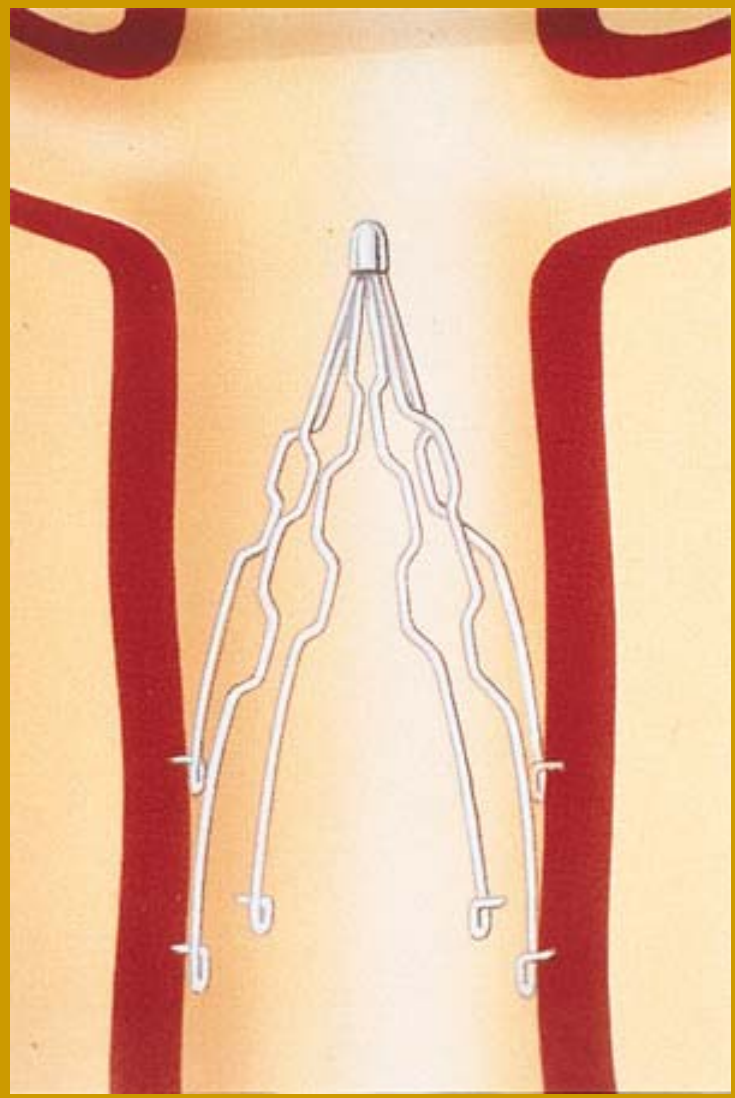
OR **ENOXAPARIN**
1. Continue enoxaparin 1 mg/kg sq q12h or 1.5 mg/kg sq q24h
2. Adjust warfarin based on INR results (goal is 2.0–3.0)

Day 5 OR **subsequent date**
HEPARIN
1. Discontinue heparin after: (a) Completion of 4–5 days heparin/warfarin therapy AND (b) INR between 2.0-3.0 on two consecutive days
2. Continue warfarin with goal INR of 2.0–3.0 for patient-specific duration of therapy

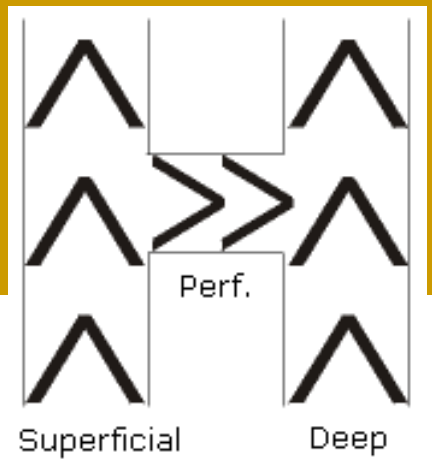
OR **ENOXAPARIN**
1. Discontinue enoxaparin after: (a) Completion of 5 days heparin/warfarin therapy AND (b) INR between 2.0–3.0
2. Continue warfarin with goal INR of 2.0–3.0 for patient-specific duration of therapy

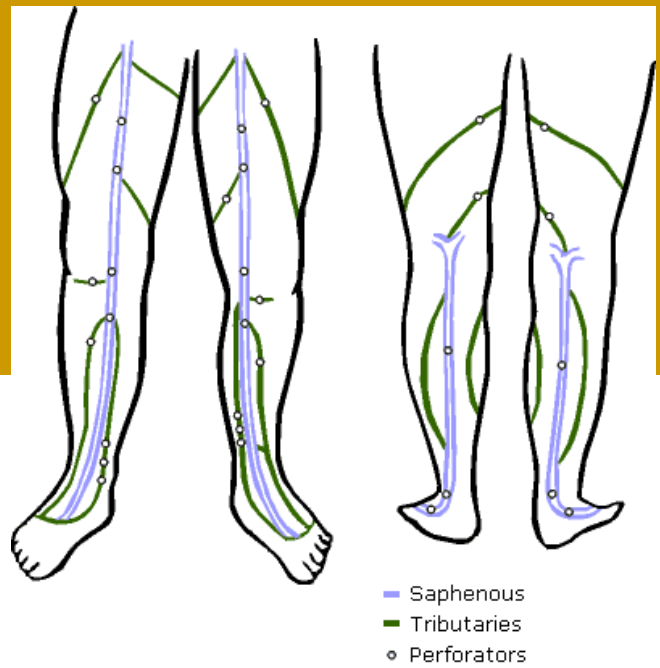
Source: references 6,27

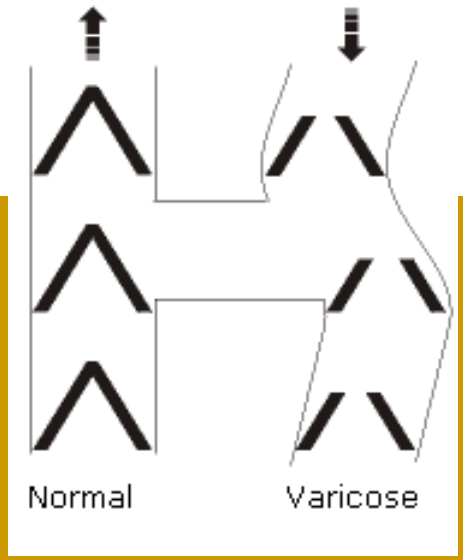

medivent travel

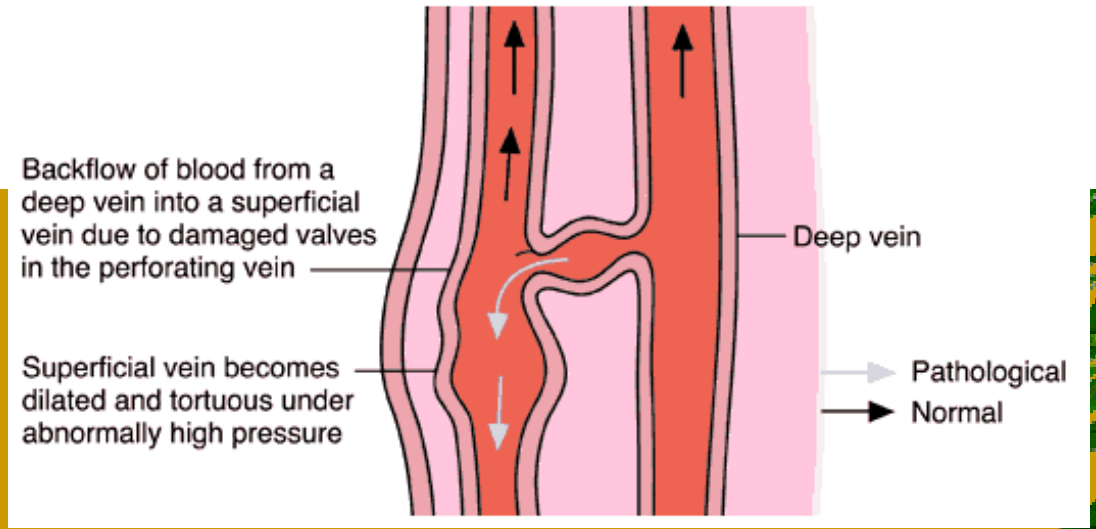


The Amtec Venometer

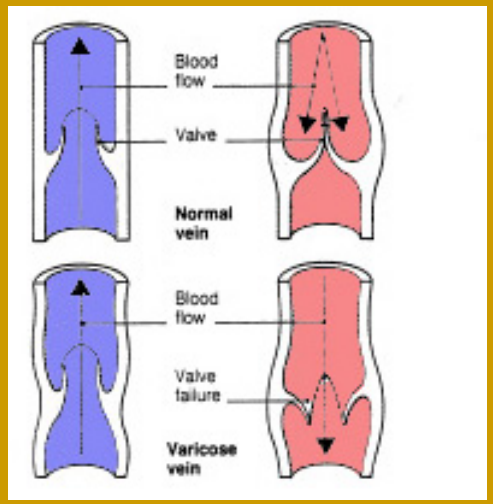


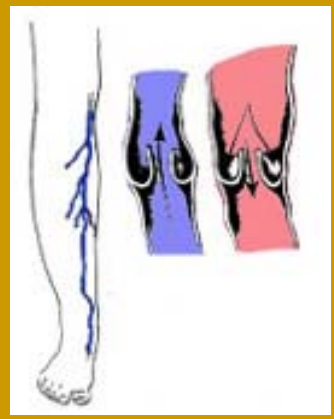






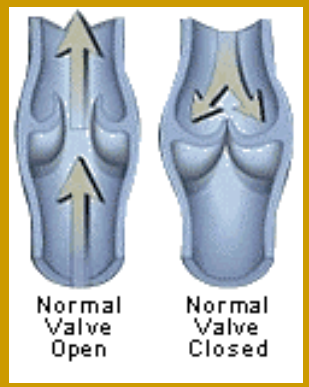
www.healthandage.com/html/res/primer/skin.htm

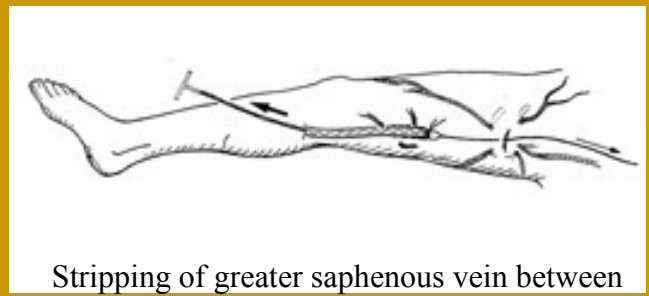




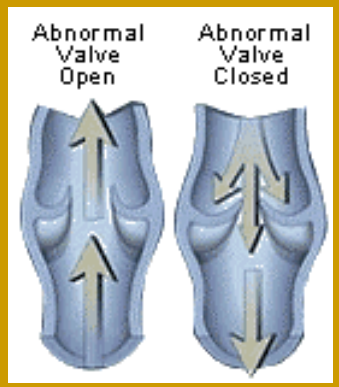
Normal vein with functioning valves to prevent backflow of blood

Varicosed vein with faulty valve



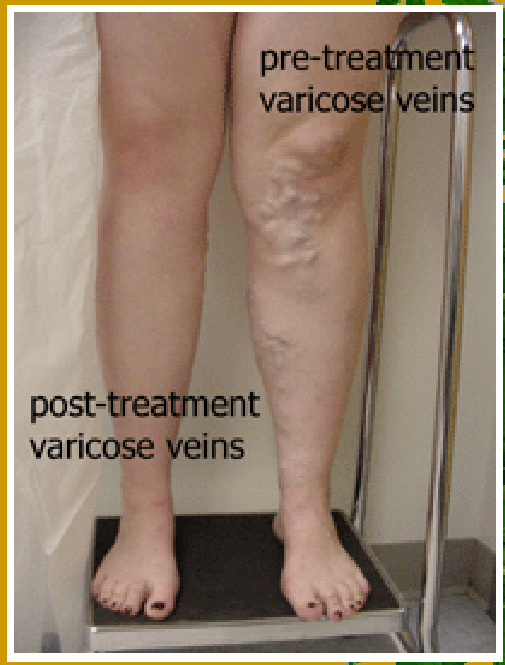


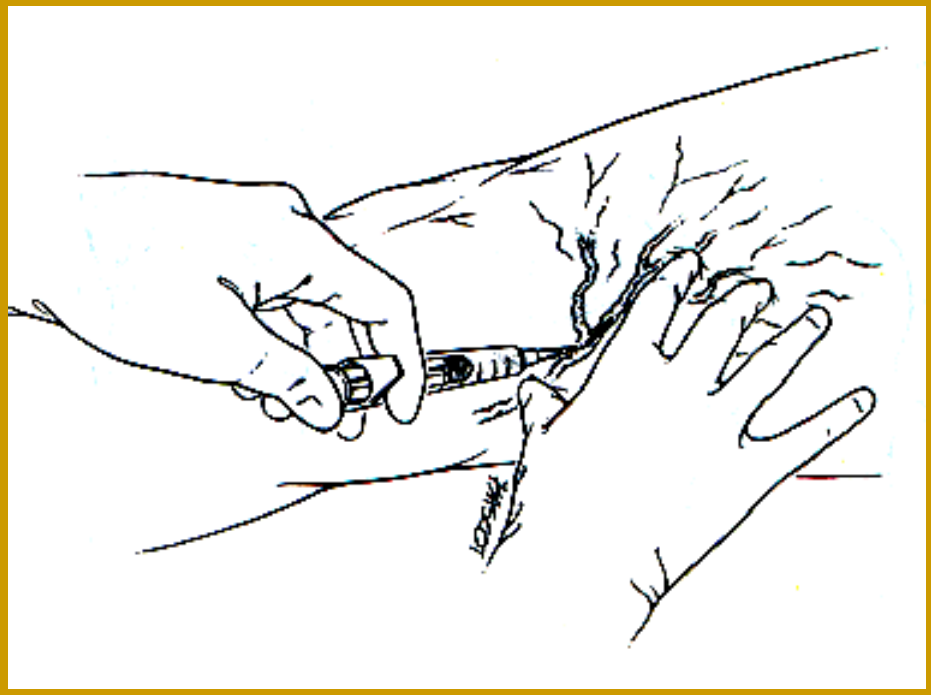
Stripping of greater saphenous vein between saphenofemoral junction and location above or below the knee. Rope silk used to withdraw stripper and mass of vein through larger groin incision.



www.wramc.amedd.army.mil/departments/surgery/vascular/removal.htm

Before and after picture of a patient following a varicose vein closure procedure





sclerotherapy

Spider Veins (telangiectasia): Before and After Treatment

Definitions:

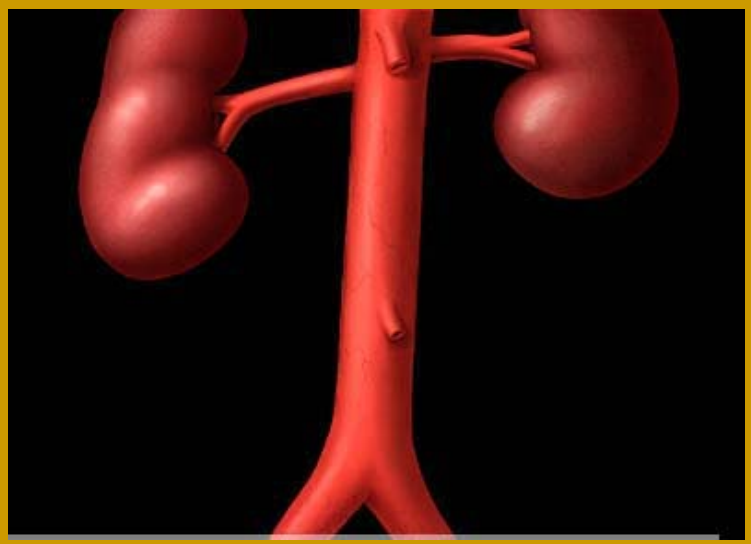
Aortic Aneurysm

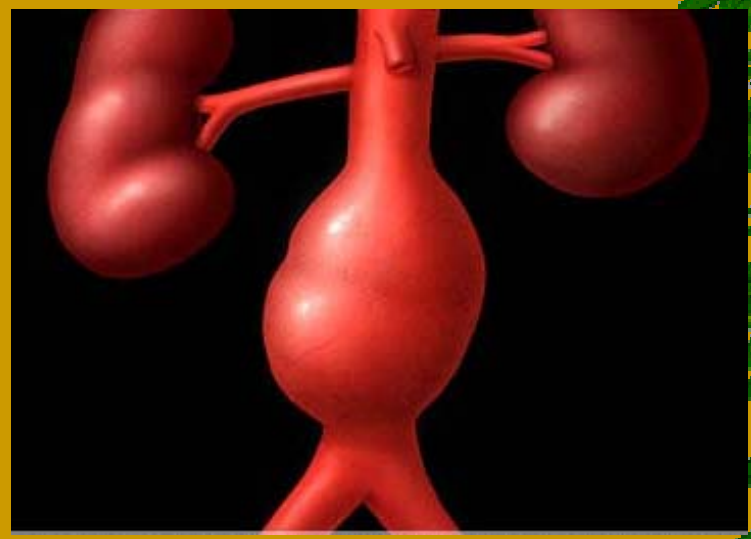
...a permanent, localized dilation of a blood vessel.

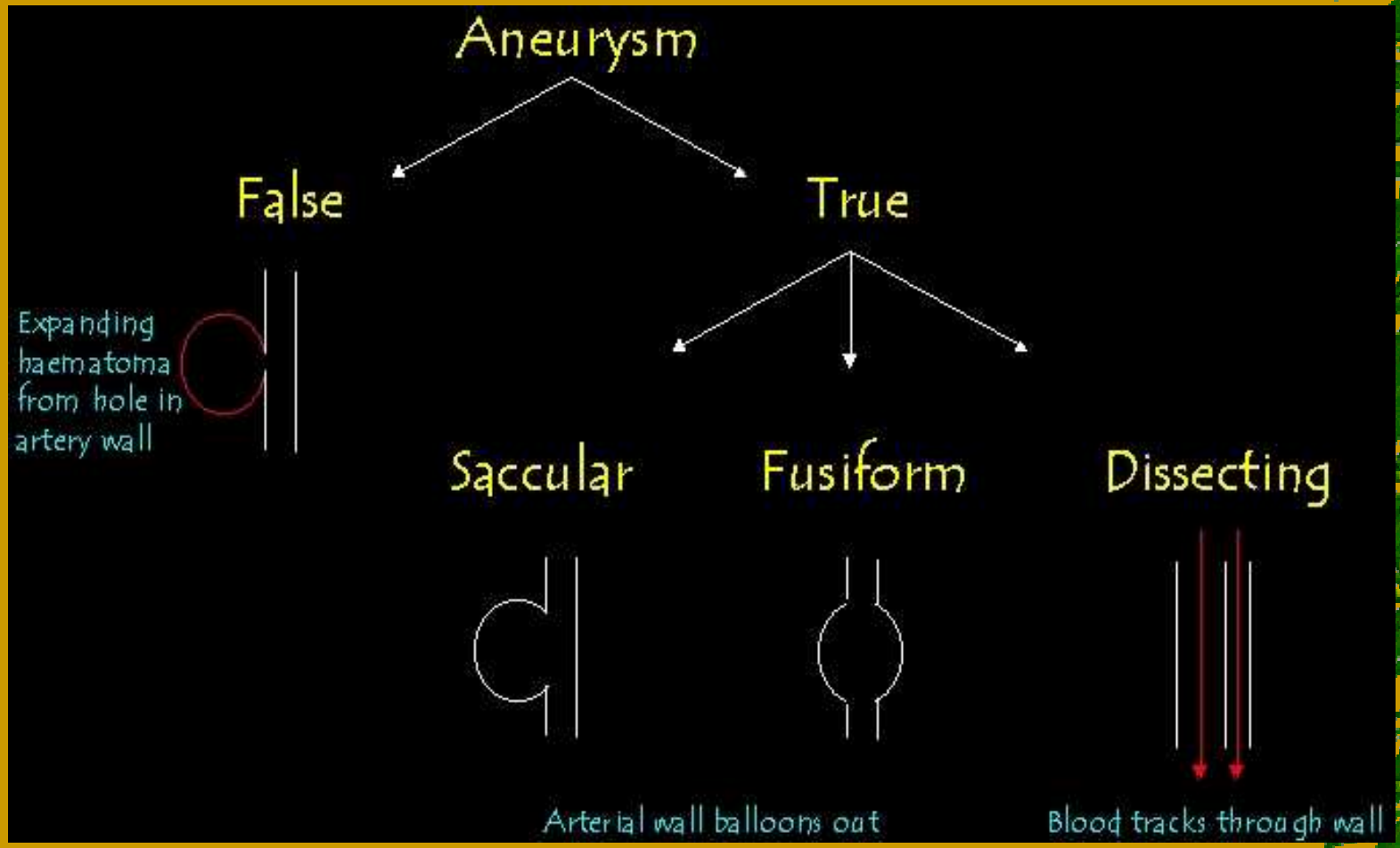
-(Tilson 1997)

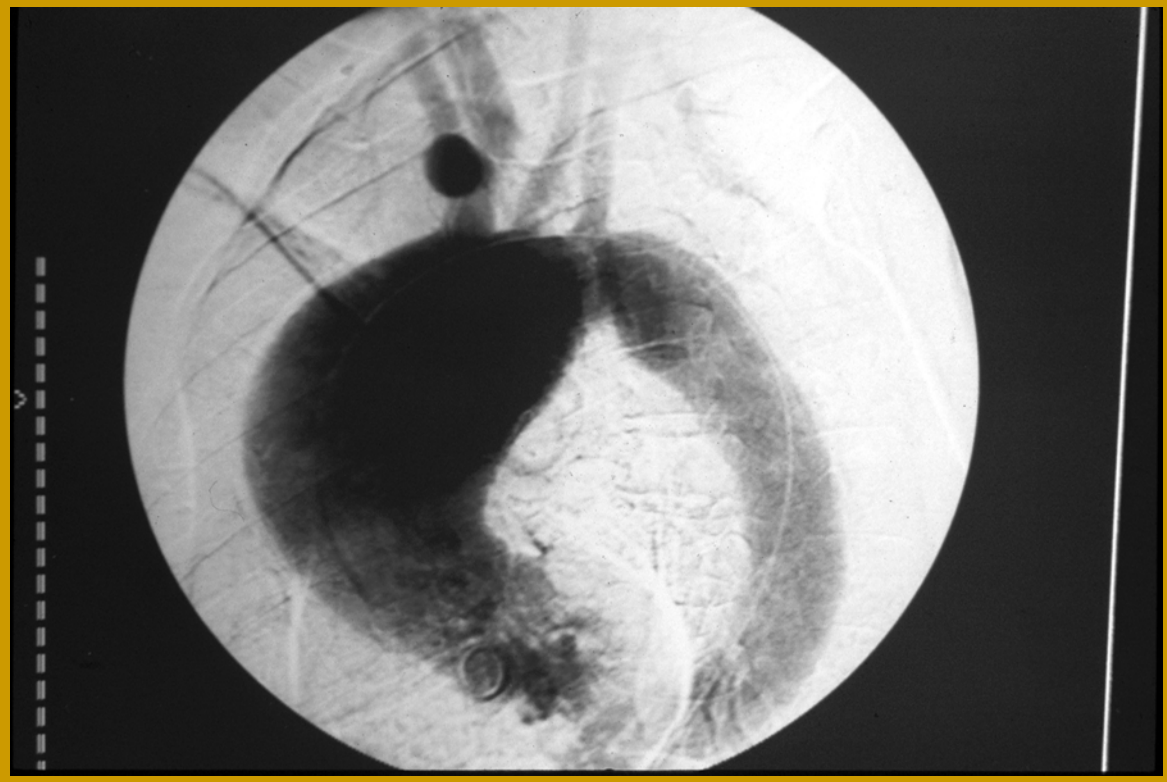
…a 50% increase in the diameter of a vessel compared with its expected normal diameter.

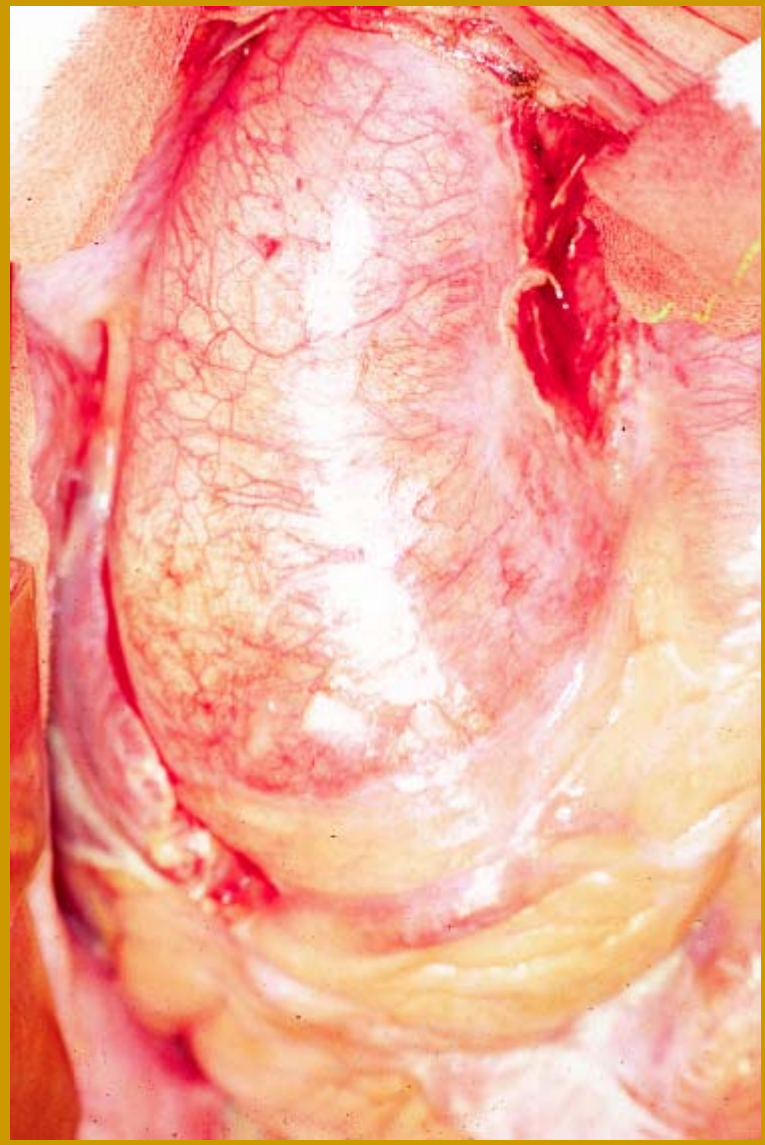
-Society of Vascular Surgery & International Society for Cardiovascular Surgery Reporting Standards (Johnson 1991)



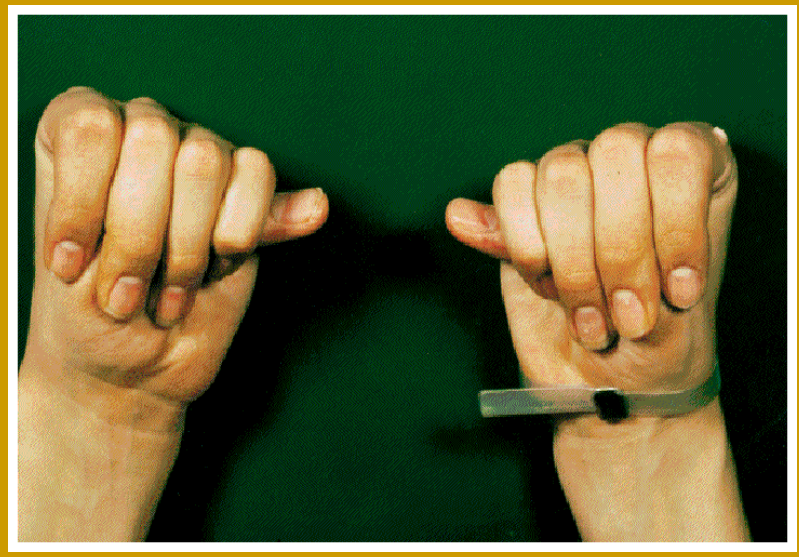



Aneurysm
False
True
Expanding haematoma from hole in artery wall
Saccular
Fusiform
Dissecting
Arterial wall balloons out
Blood tracks through wall





Ehlers-Danlos Syndrome



Loose joints are characteristic of Marfan Syndrome, "The 'Thumb Sign' in Marfan Syndrome," *New England Journal of Medicine* 333(7): 430.

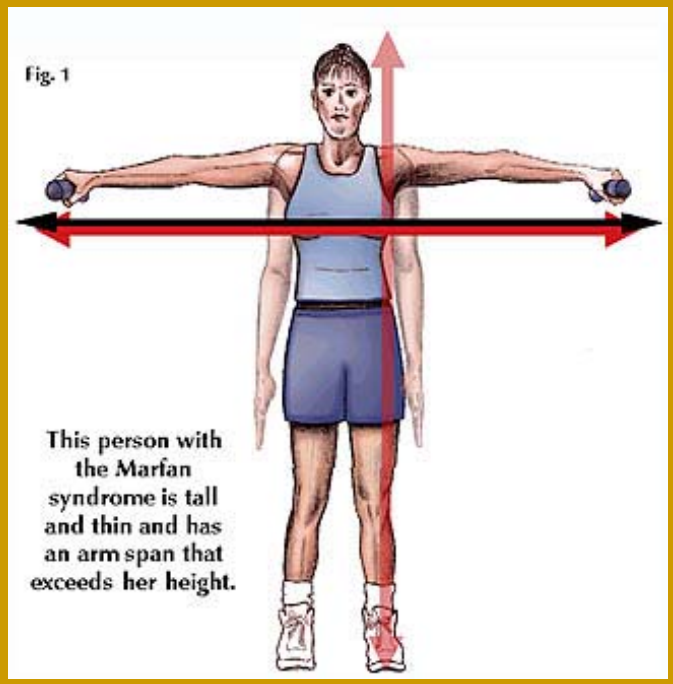


Fig. 1
This person with the Marfan syndrome is tall and thin and has an arm span that exceeds her height.


Fig. 2

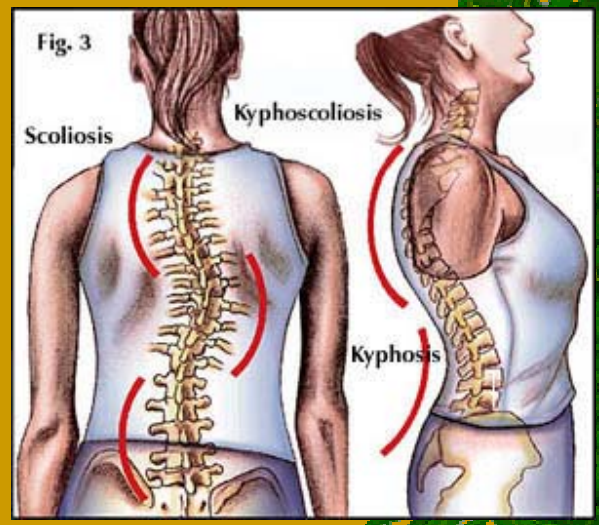


Fig. 3
Scoliosis
Kyphoscoliosis
Kyphosis

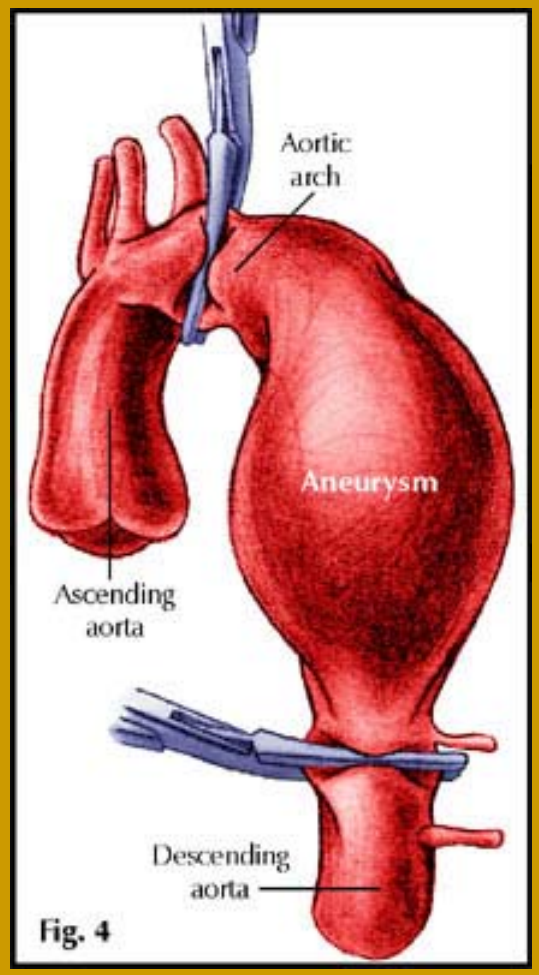
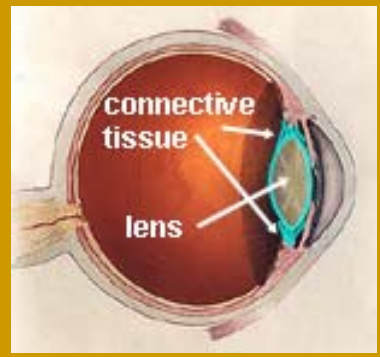
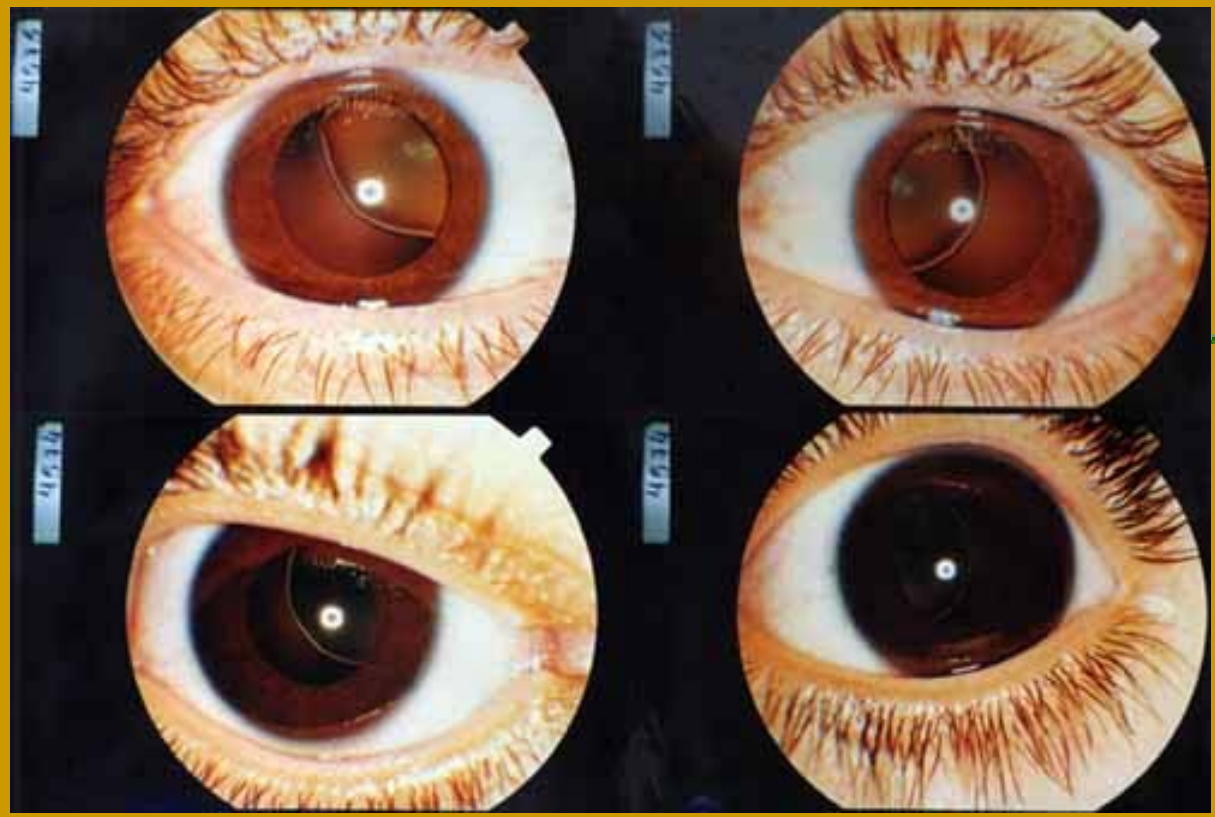
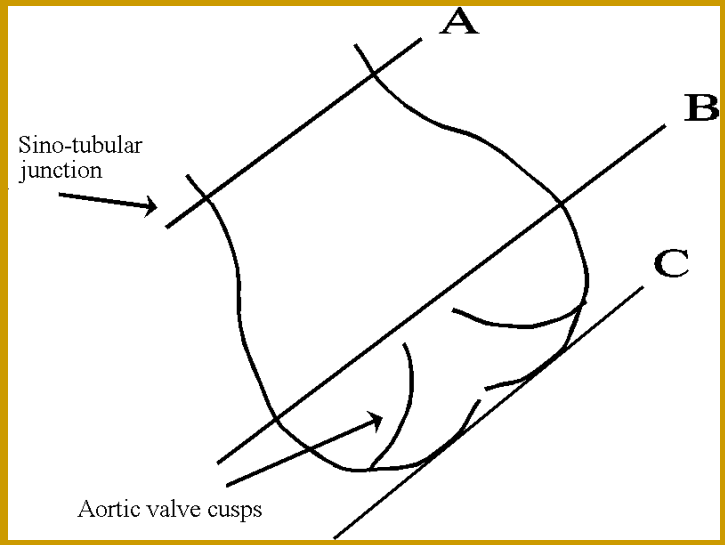


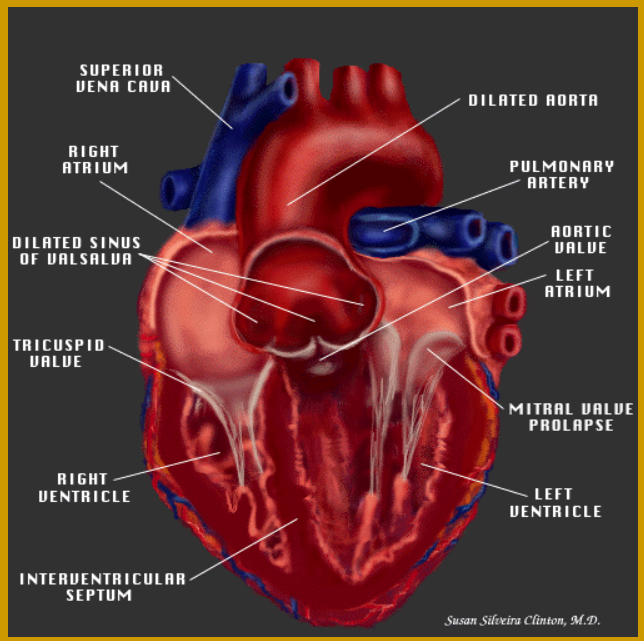
Fig. 4





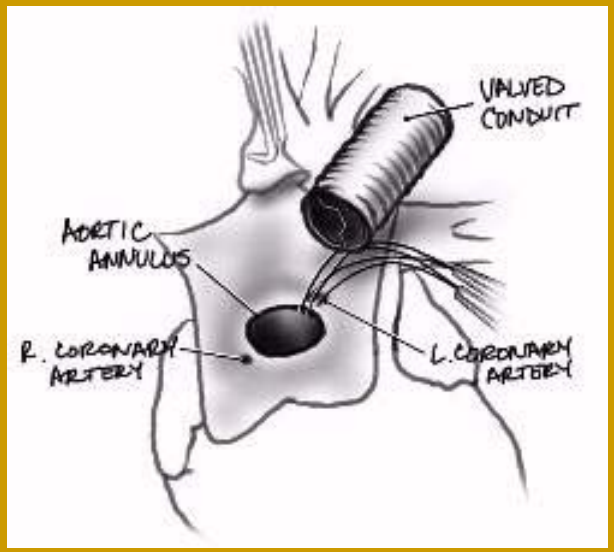
. Lens subluxation

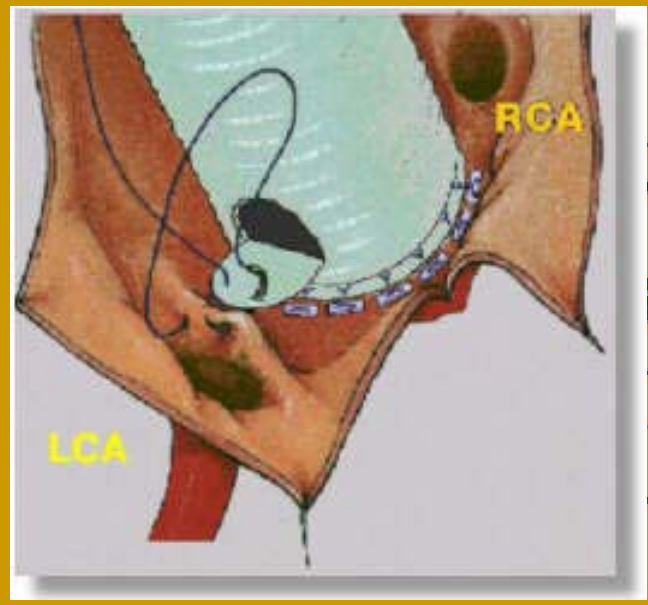

A
B
C
Sino-tubular junction
Aortic valve cusps

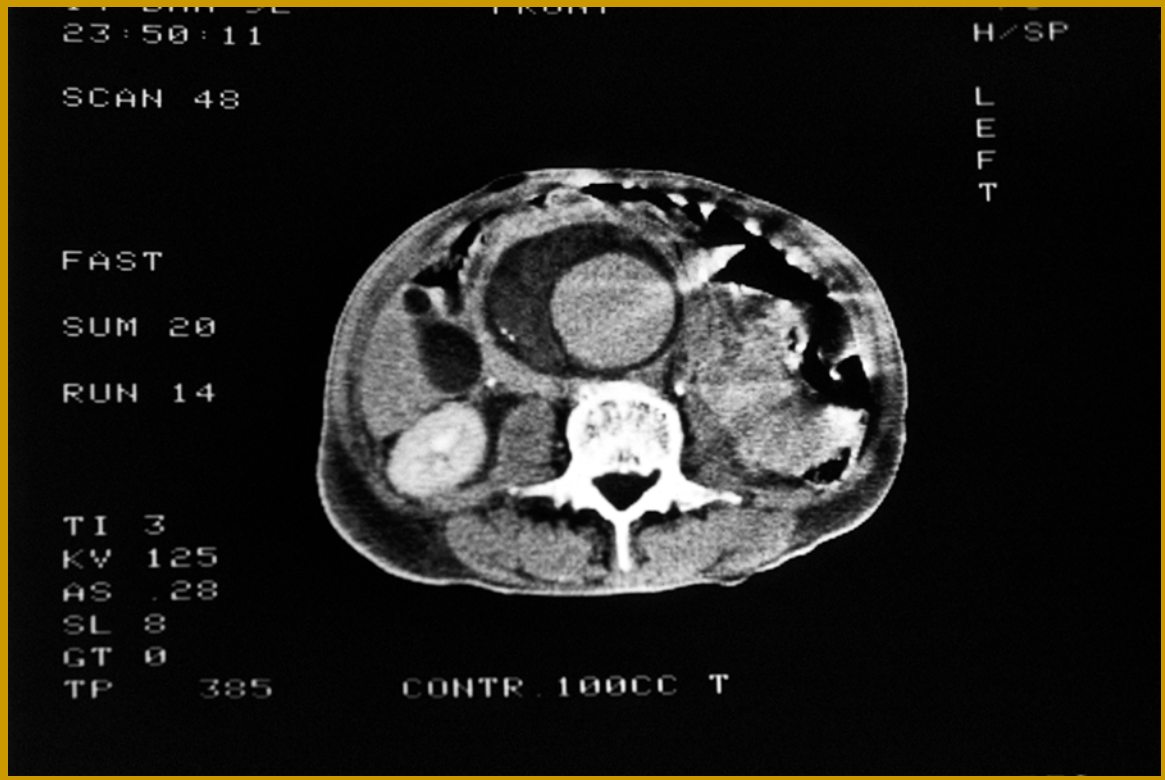

SUPERIOR VENA CAVA
DILATED AORTA
RIGHT ATRIUM
PULMONARY ARTERY
AORTIC VALVE
DILATED SINUS OF VALSALVA
LEFT ATRIUM
TRICUSPID VALVE
MITRAL VALVE PROLAPSE
RIGHT VENTRICLE
LEFT VENTRICLE
INTERVENTRICULAR SEPTUM
Susan Silveira Clinton, M.D.

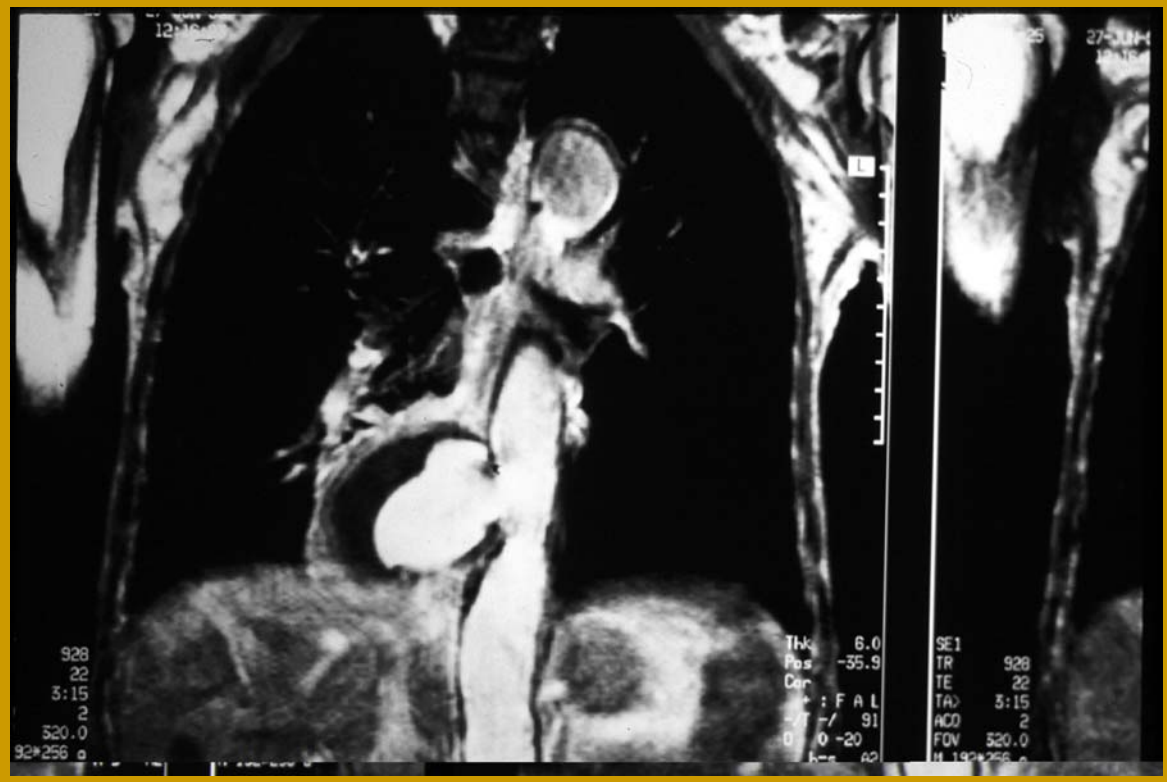
Bentall-DeBono procedure

Bentall Procedure

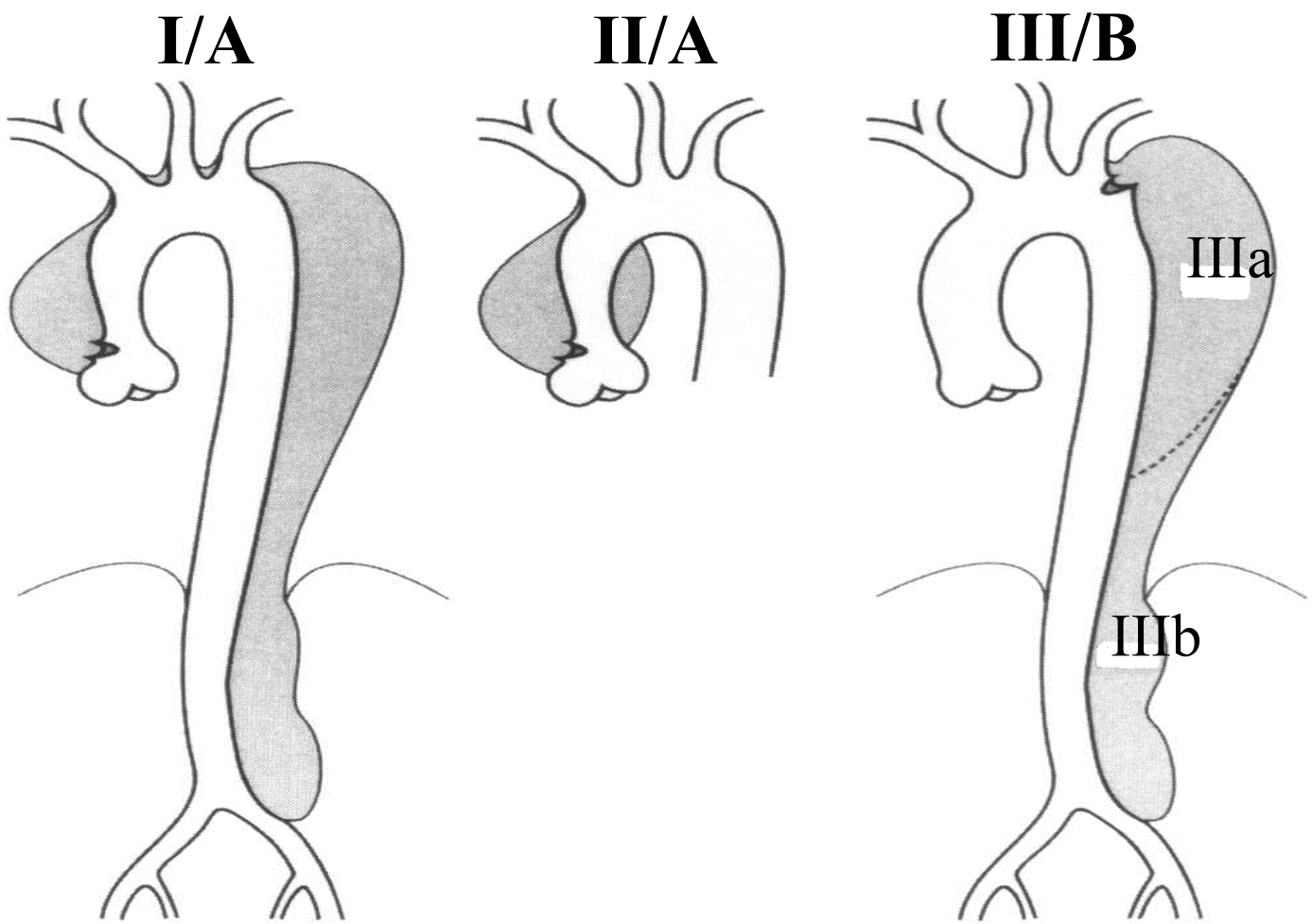





23:50:11
H/SP
SCAN 48
L
E
F
T
FAST
SUM 20
RUN 14
TI 3
KV 125
AS .28
SL 8
GT 0
TP 385
CONTR 100CC T

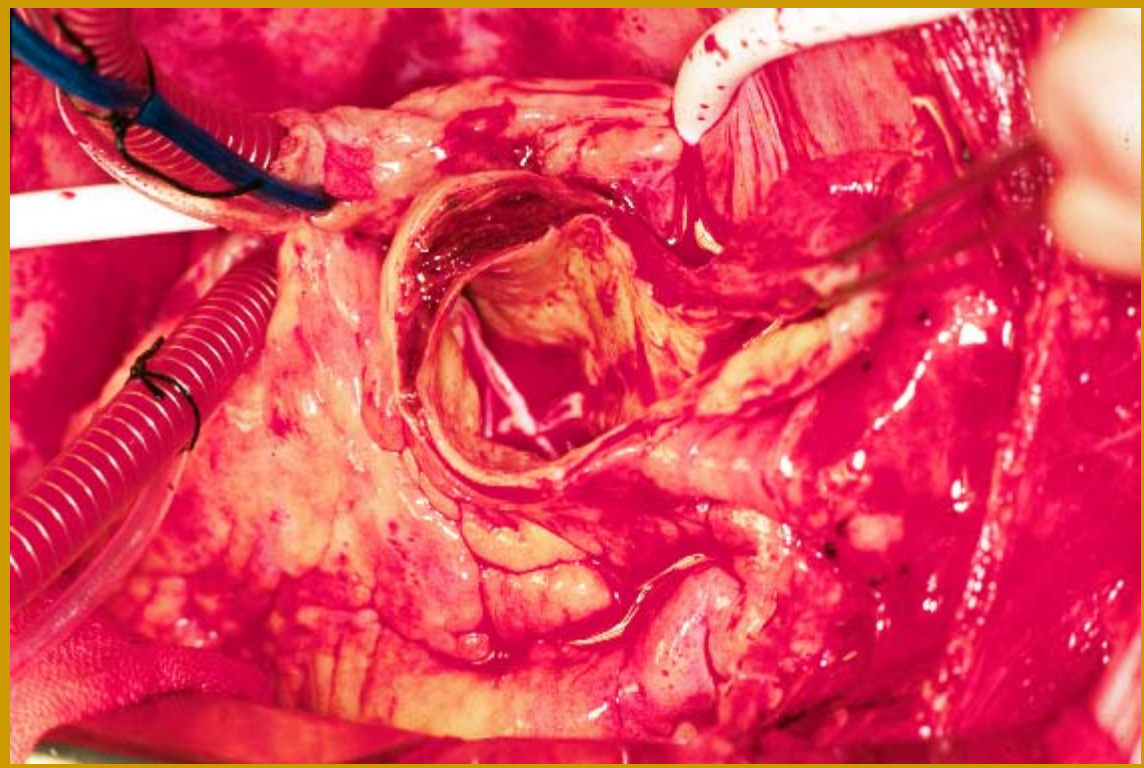

928
22
3:15
2
520.0
6.0
-35.9
-20
SE1
TR 928
TE 22
TA 3:15
ACQ 2
FOV 520.0

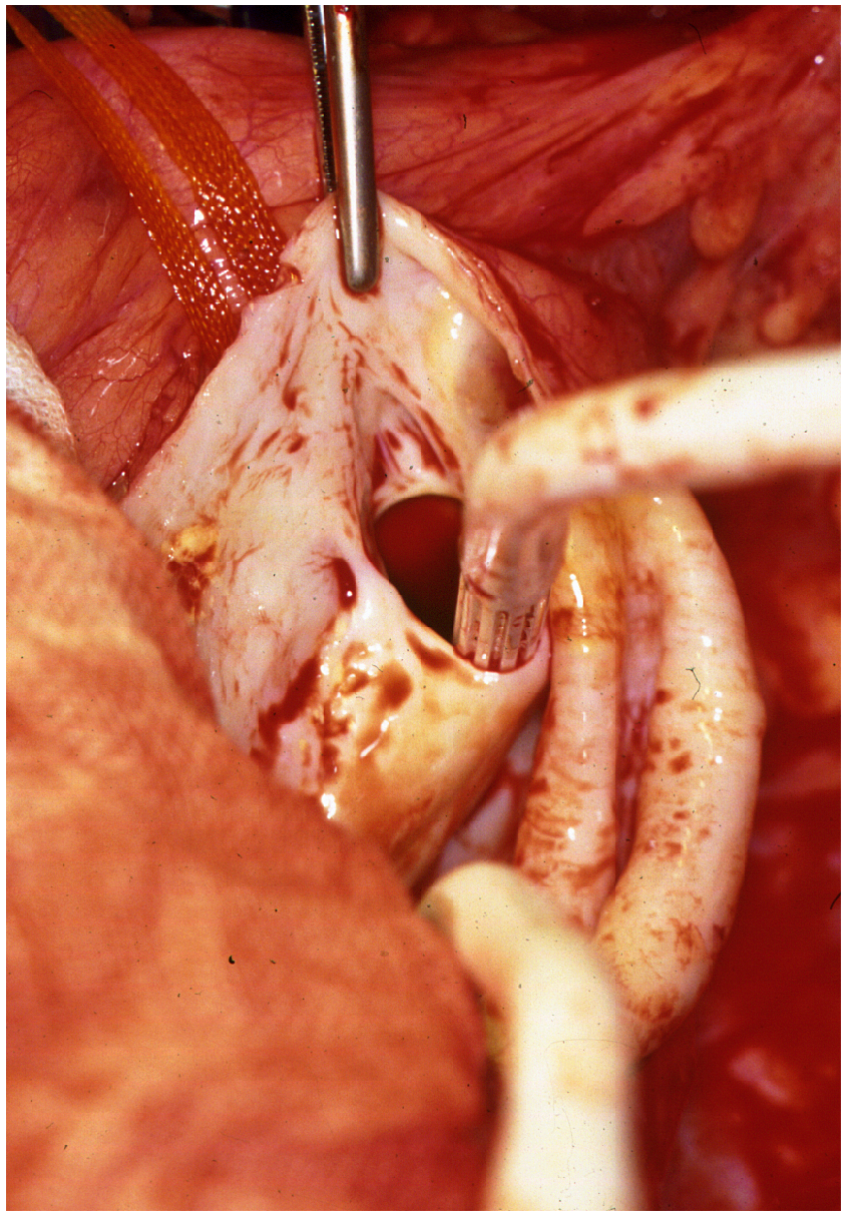
主動脈剝離分類法

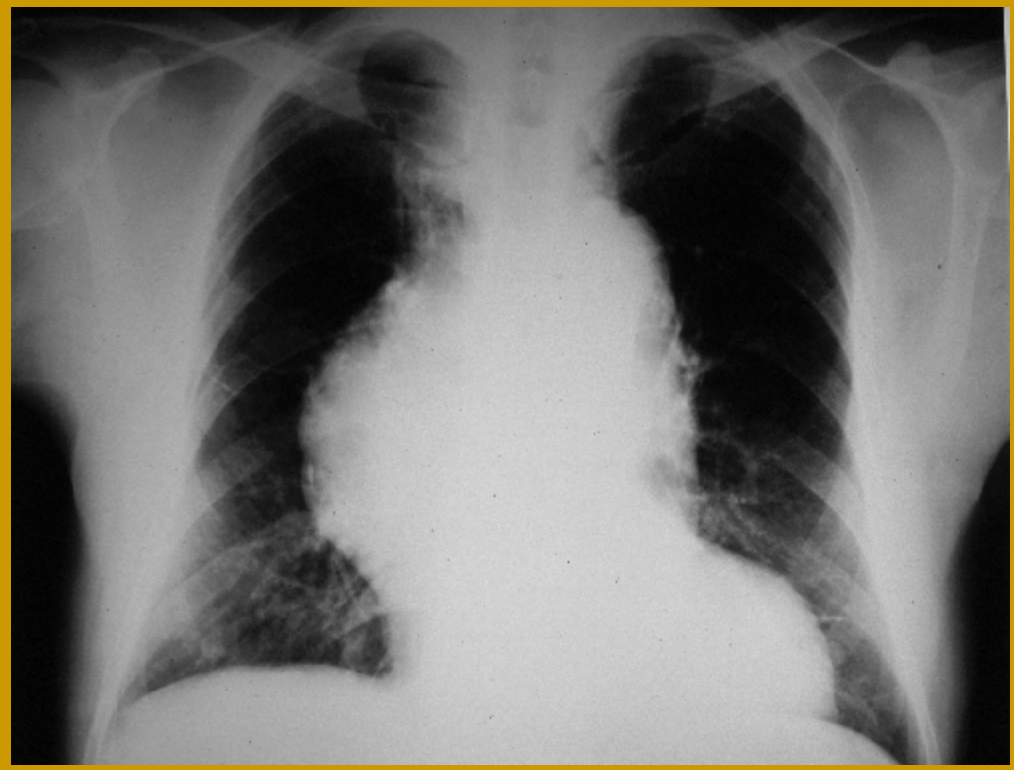


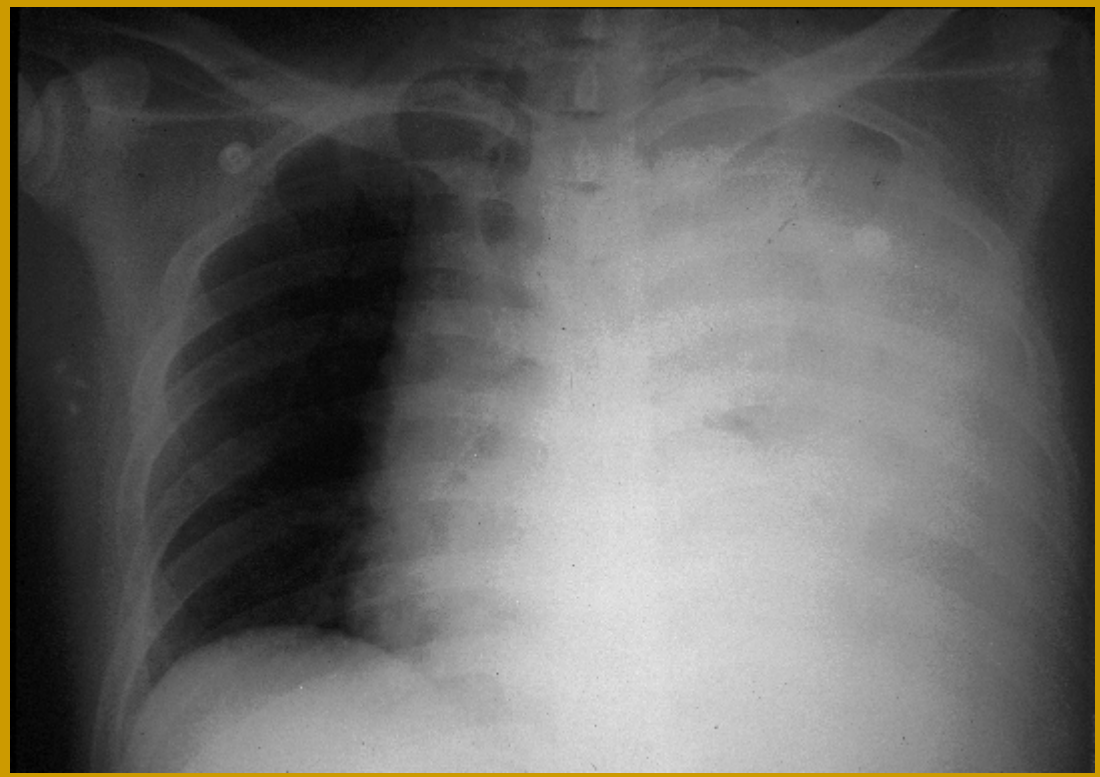
DeBakey: I, II, IIIa, IIIb型

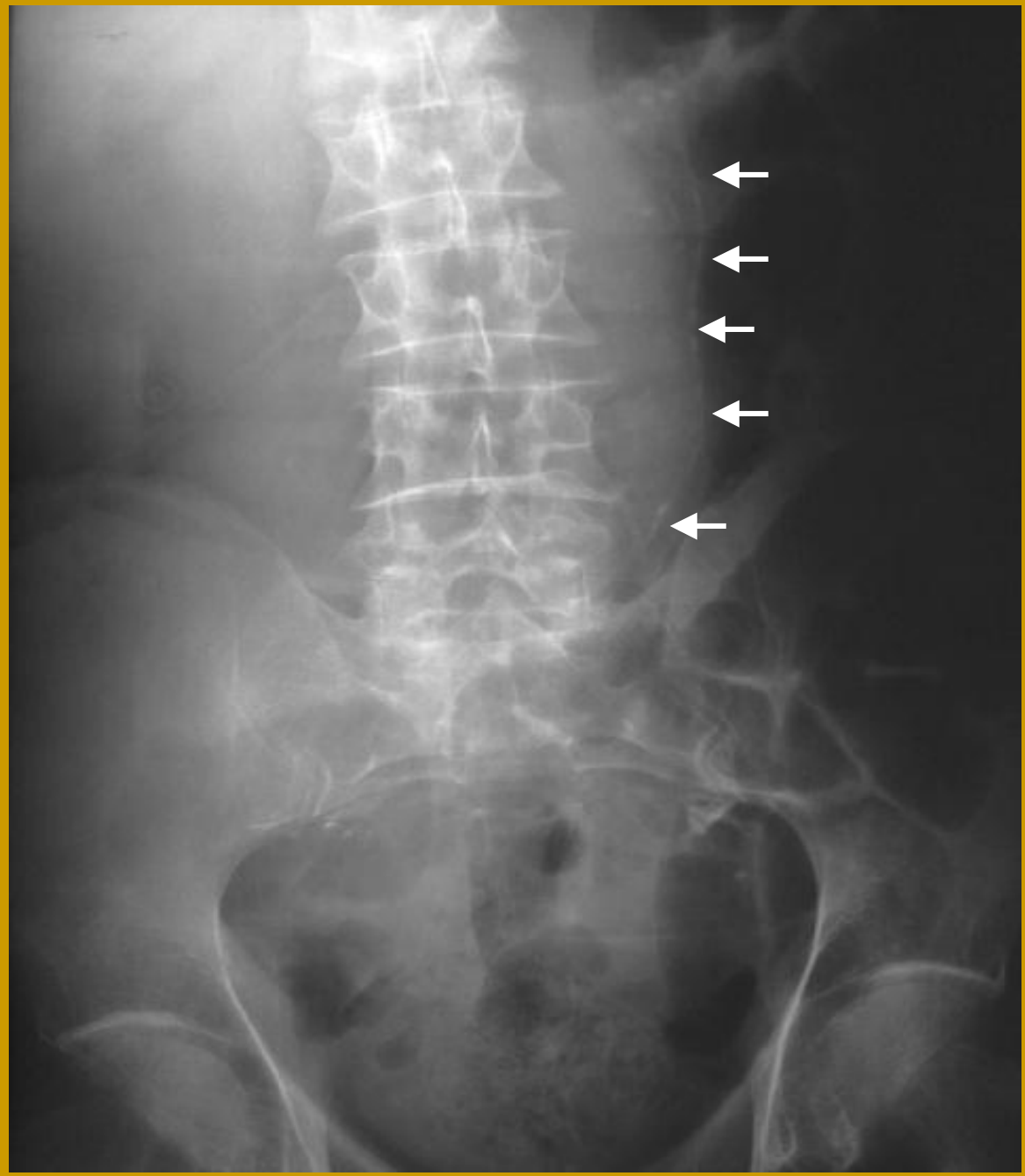
Stanford: A, B兩型

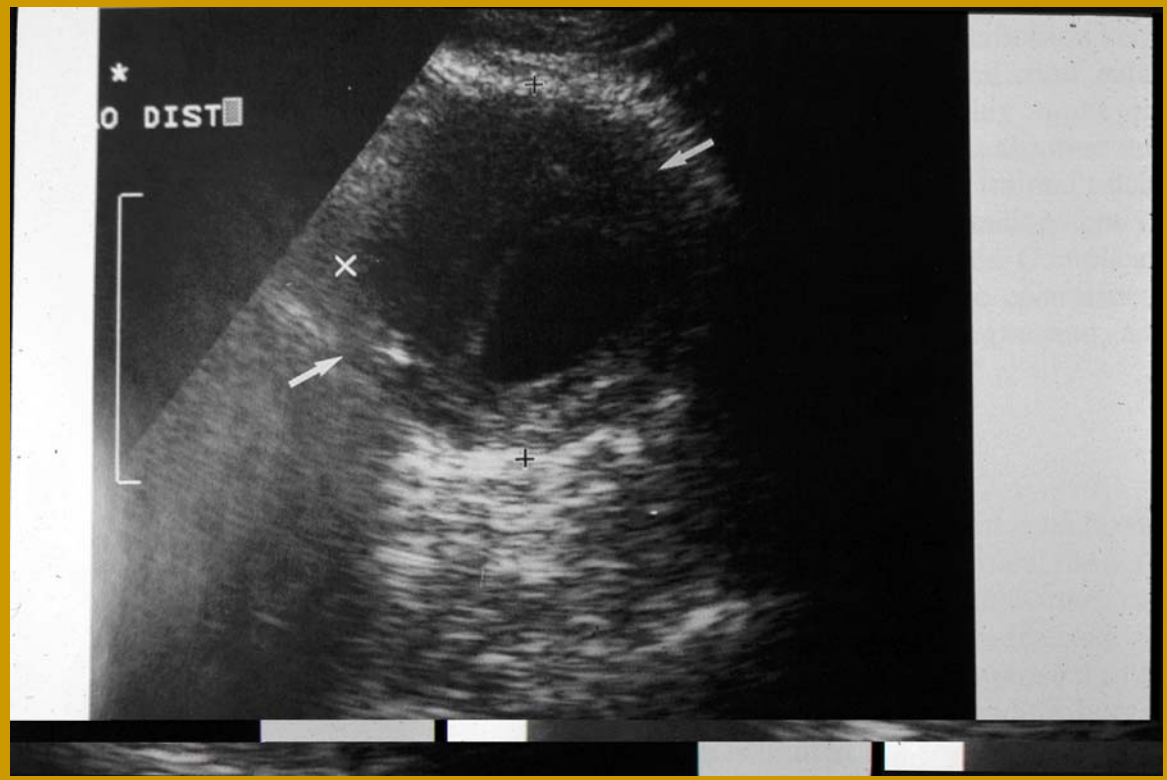


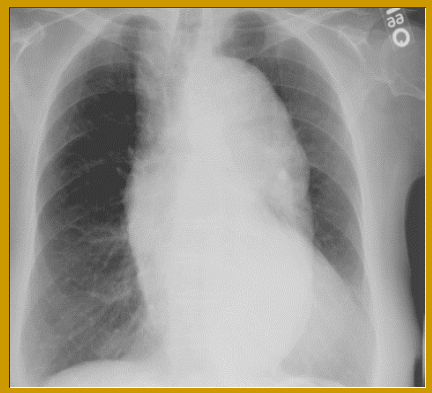


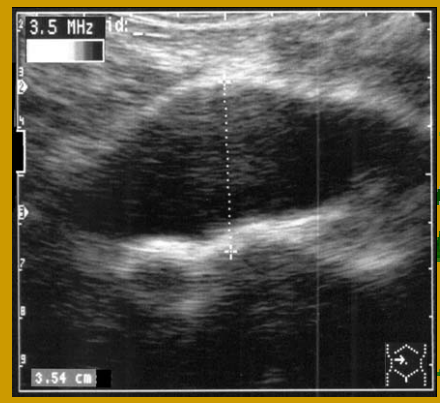







O DIST





www.freevas.demon.co.uk/library%20arterial%20aortic.htm

magnification factors constant. There is little demand today for plain film evaluation of aneurysmal disease. Its role has been largely preempted by ultrasound.[1]

ning. With this technique also, no inh
tion is recorded on the images. Spat
better than 1 mm with current mac

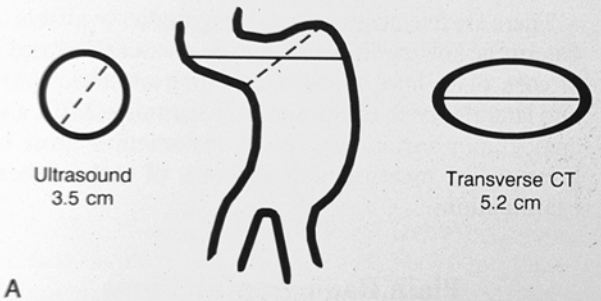
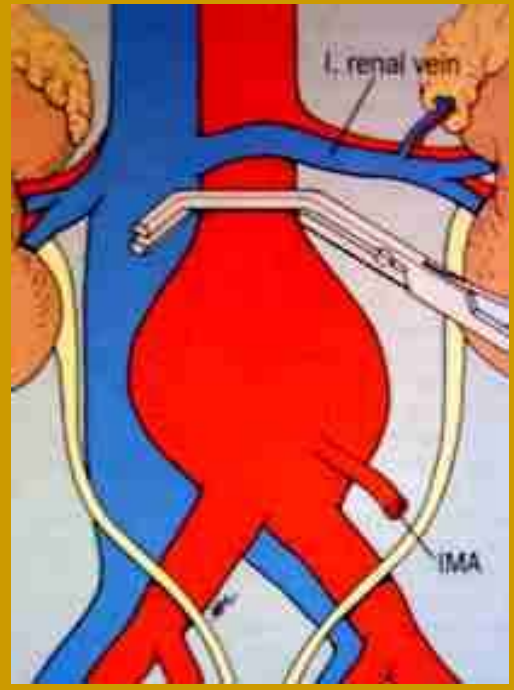
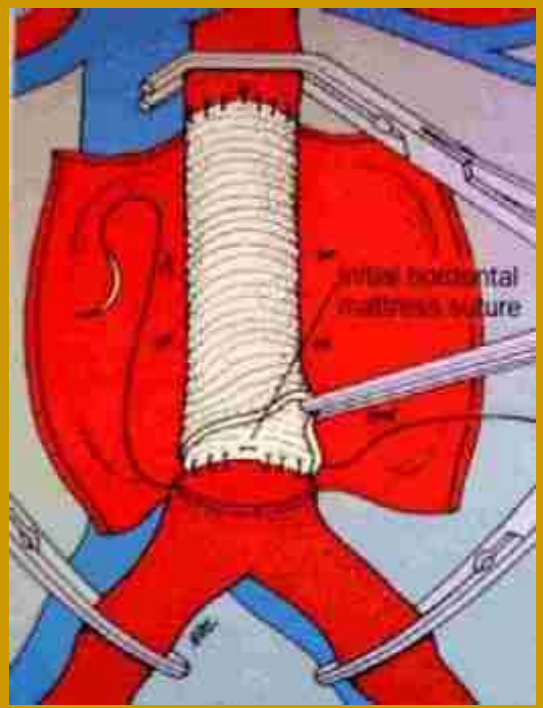


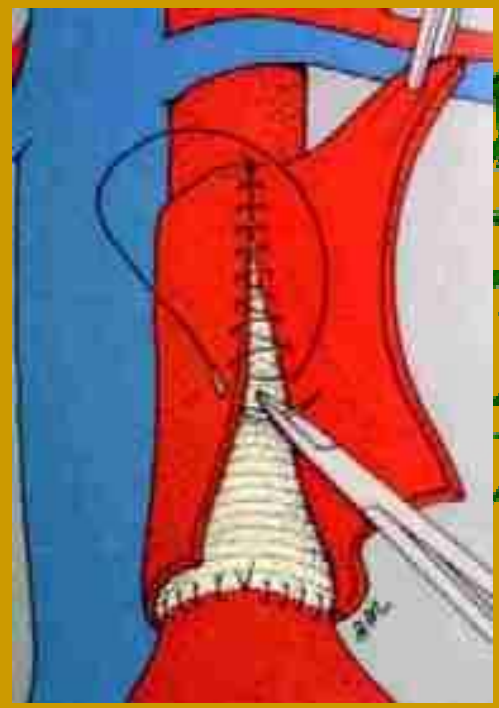
Figure 37-2 **(A)** Variation in aneurysm size measured by ultrasound and CT scan. **(B)** Incorrect me
axis through an oblique path of the left iliac artery aneurysm. Adjacent CT scan sections cephalad a
show that the iliac artery is coursing dorsally, following the sacral curve. The short axis would be
direction in which to measure for the diameter of this aneurysm.


t25.4s
D
L
10 cm

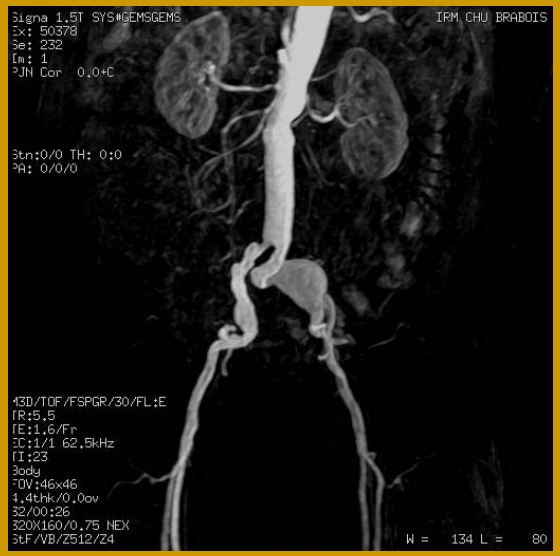

Renal vein
Aneurysm


L. renal vein
IMA


Inital horizontal
mattress suture

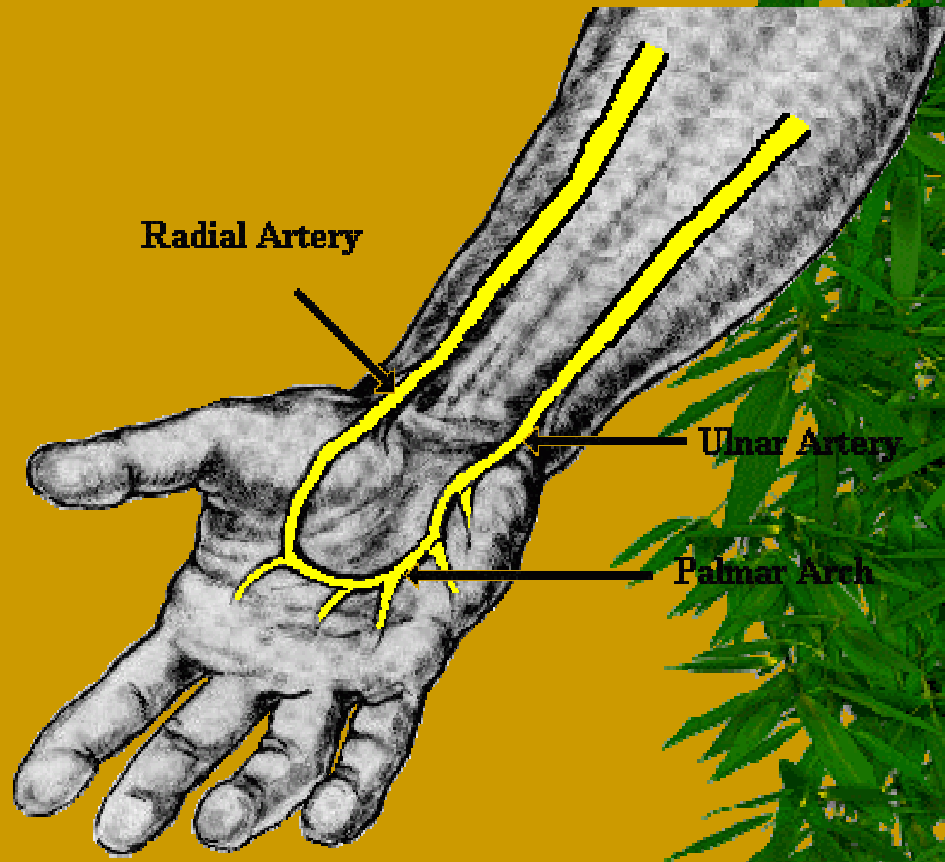



© Edaya 1999



Brachial	120	121
Thigh	140	145
AK	137	140
BK	130	132
Ankle	121	126
Toe		
API		

Brachial	90	137
Thigh	140	110
AK	137	70
BK	130	60
Ankle	121	50
Toe		
API		


Radial Artery
Ulnar Artery
Palmar Arch

體外型動靜脈廔管

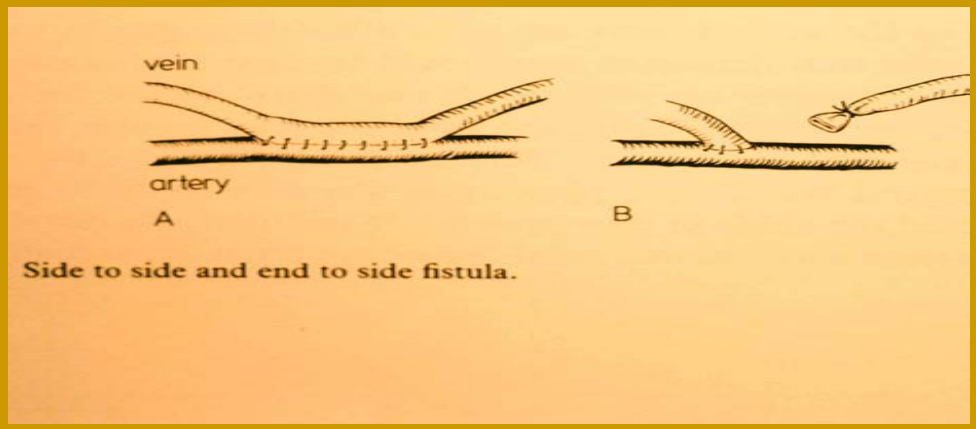
自體動靜脈廔管

- Dr. Brescia, 1966 開始介紹 radiocephalic fistula
  - 手術技巧容易
  - 不需要人工材料
  - 容易扎針
  - 長期使用率高
  - 併發症很少

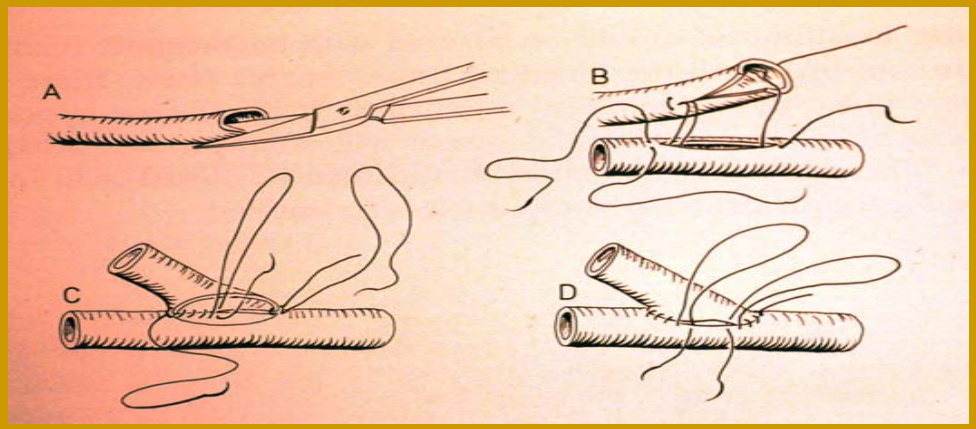
自體動靜脈廔管

- 手術前的評估
  - 觸診檢查
  - 檢查橈動脈
    - Allen test
    - Doppler study, angiography
  - 檢查頭臂靜脈
    - 阻塞性靜脈炎
    - Doppler study, phlebography

手術方式

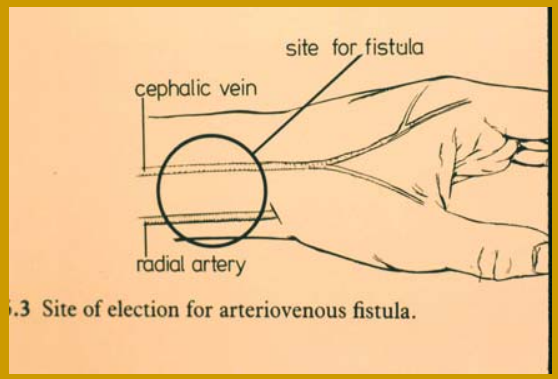


Side to side and end to side fistula.

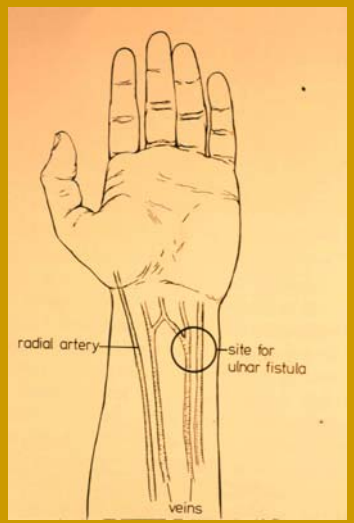


- 局部、區域、全身麻醉來執行
- 靜脈端對動脈邊(Venous end to arterial side)為最常用的手術方式

手術方式



.3 Site of election for arteriovenous fistula.



- 其他的選擇：
  - 基底靜脈 – 尺動脈
  - 頭臂靜脈 – 肱動脈
- 選擇部位順序：
  - 自體血管：手腕 – 前臂 – 手肘
  - 人工血管：前臂 – 上臂 – 大腿

其他動靜脈廔管

- 人工動靜脈廔管：目前最常使用
  - PTFE: polytetrafluoroethylene
  - 至少兩個禮拜以後才可以使用
  - Semi-synthetic artificial graft
- 自體大隱靜脈廔管
- 人類臍帶靜脈
- 豬頸動脈


USE OF GORE TUNNELER
REDUCES TISSUE TRAUMA
ASSURES GOOD TISSUE / GRAFT PROXIMITY
LESSENS RISK OF GRAFT WETTING
LESSENS RISK OF GRAFT TWISTING