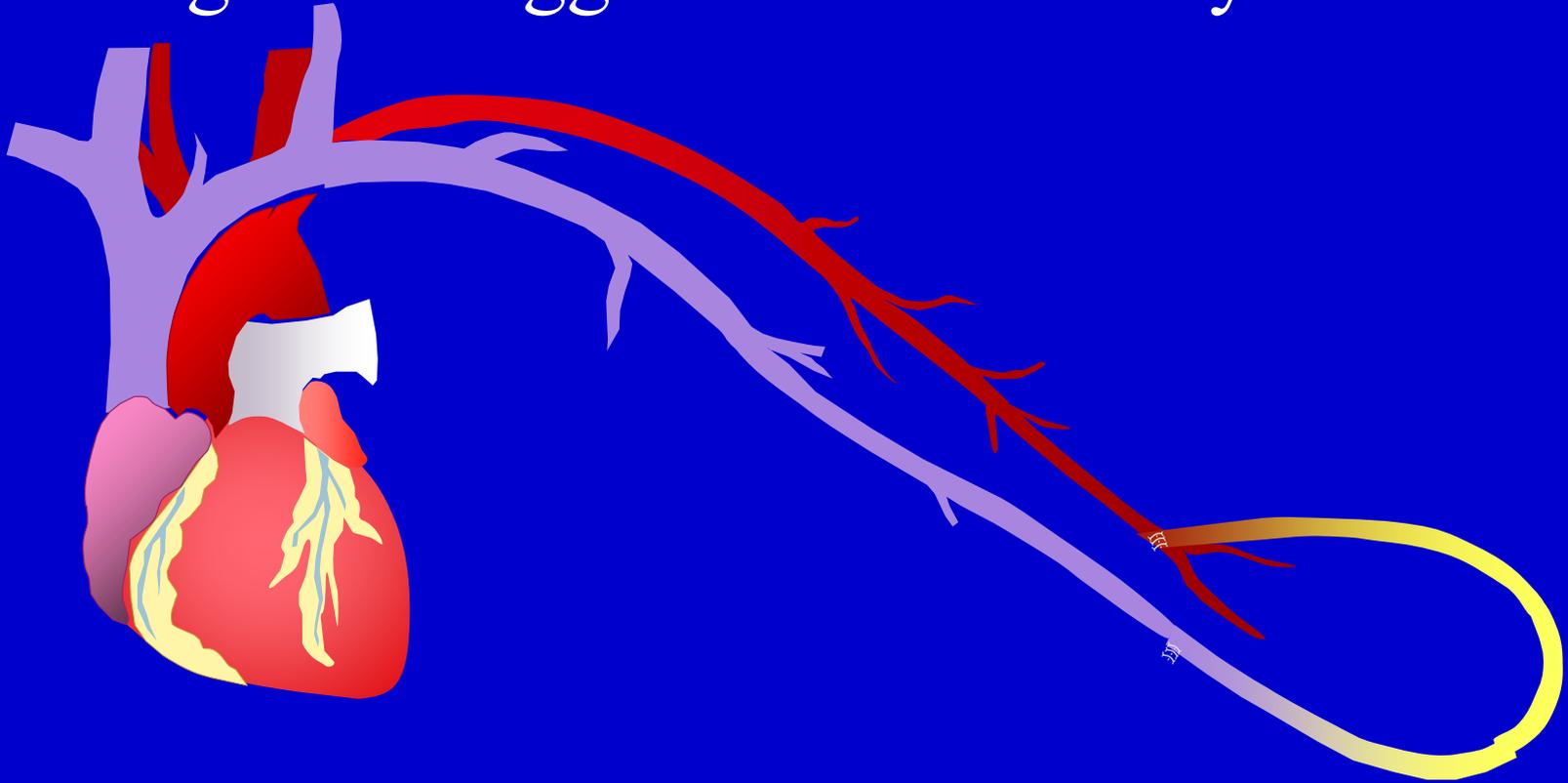
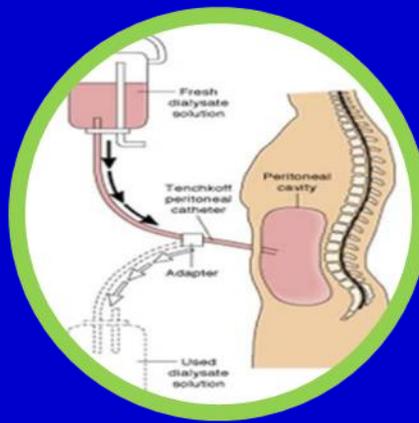


Kirurgisk anlæggelse af hæmodialysefistler

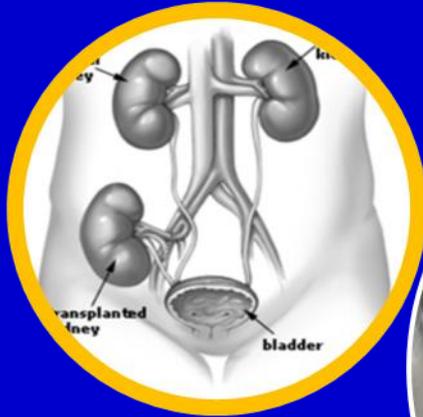


Overlæge Dmitriy Shilenok
Karkirurgisk afd. Kolding sygehus
07.10.21





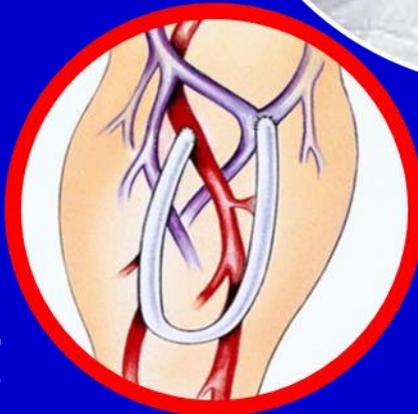
Peritoneal dialyse



Transplantation



Kateter

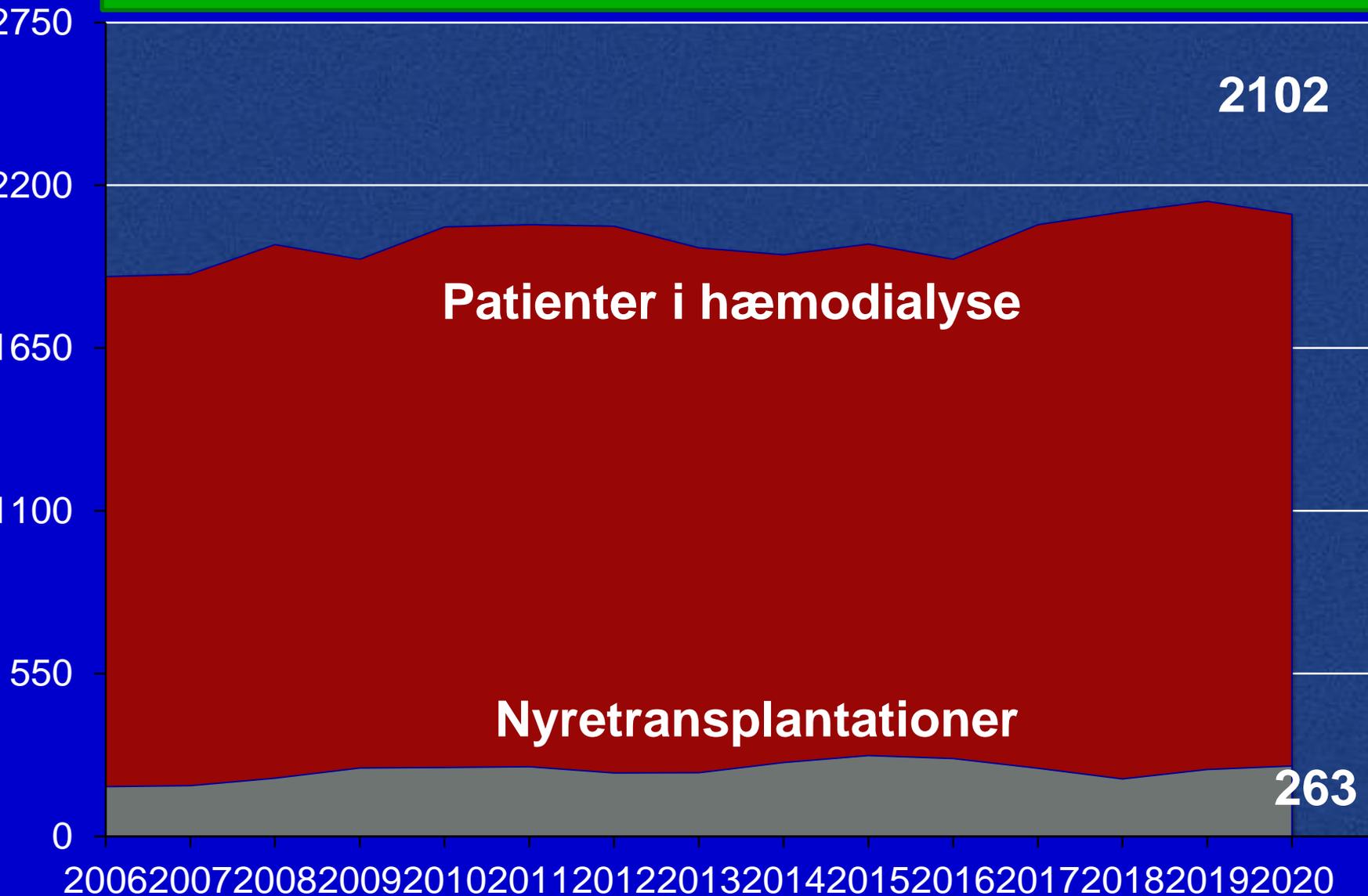


Bridgeraft

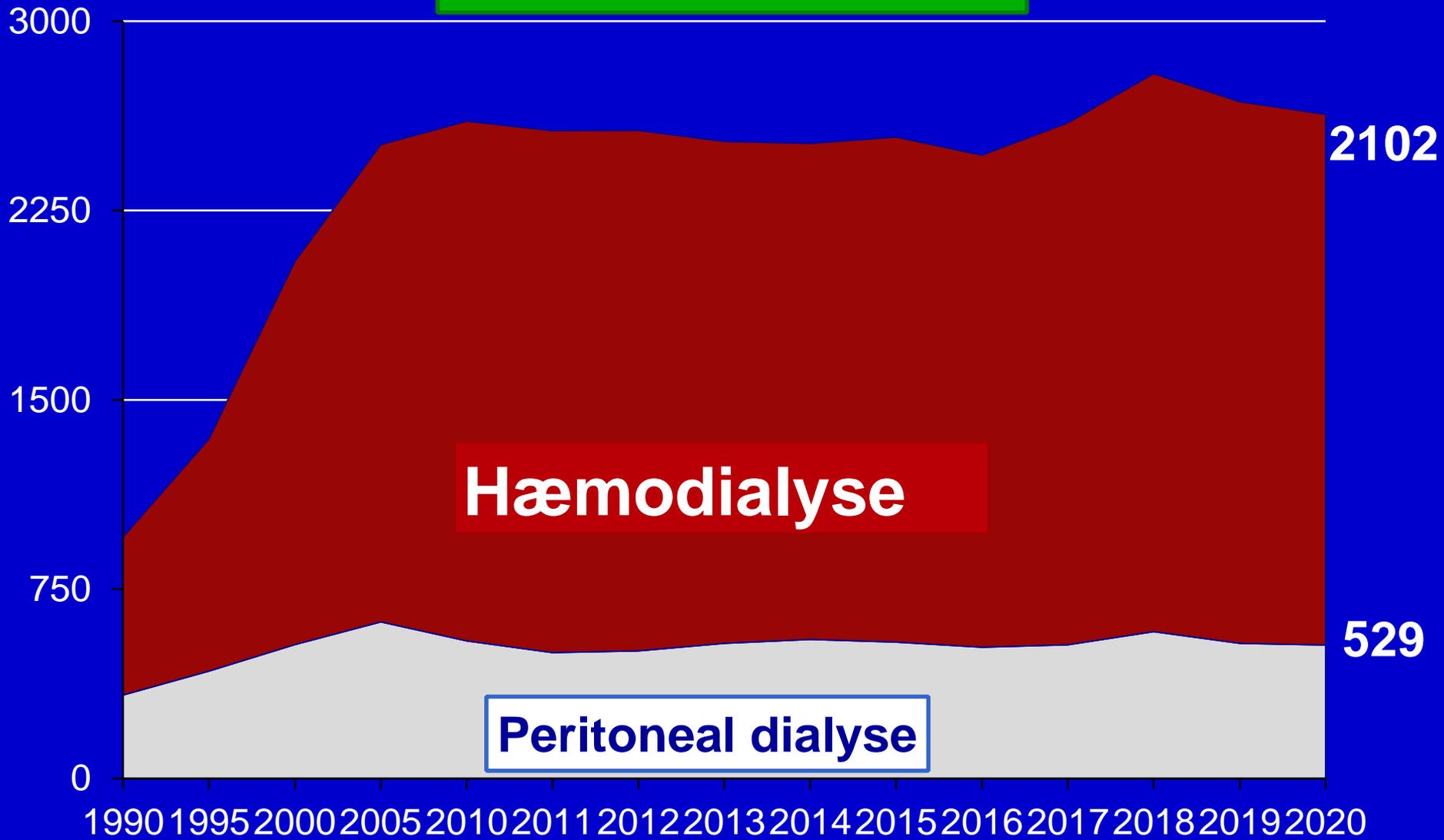


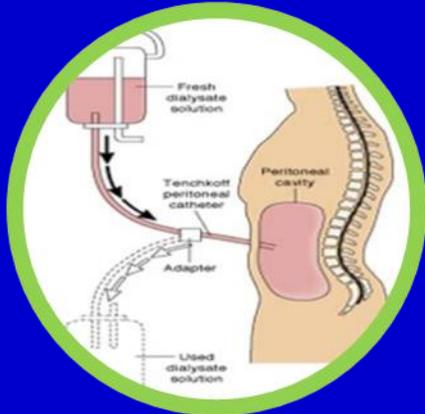
Fistel

Nyretransplantationer foretaget i Danmark 2006-2020

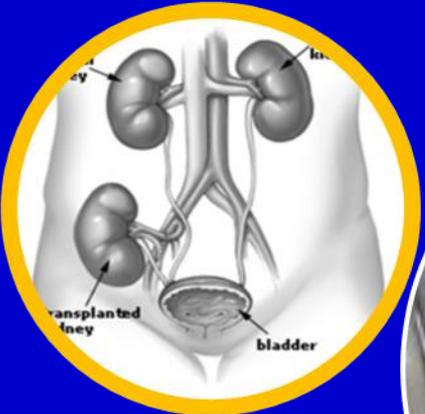


Dialysetyper i Danmark





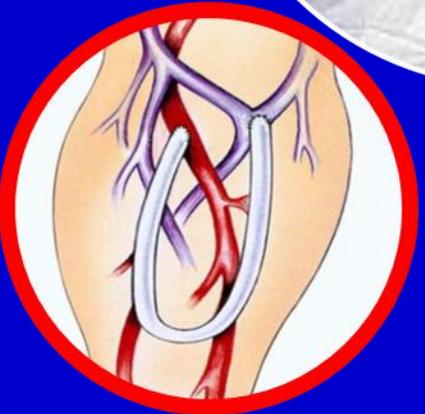
Peritoneal dialyse



Transplantation



Kateter

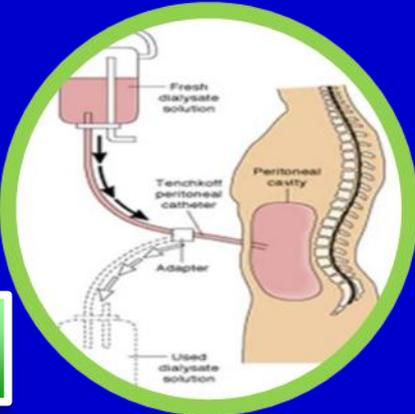


Bridgeraft

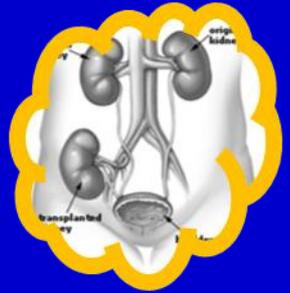


Fistel

ca. 10% pt. om et år



Peritoneal dialyse



Transplantation



Kateter

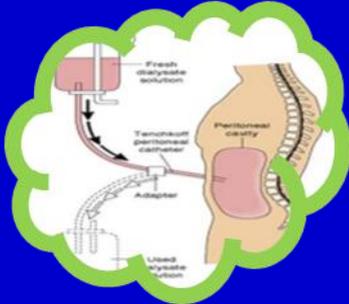


Bridgeraft

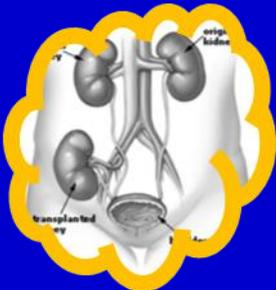


Fistel

ca. 10% pt. om et år



Peritoneal dialyse –
ca. 25% pt.



Transplantation



Kateter



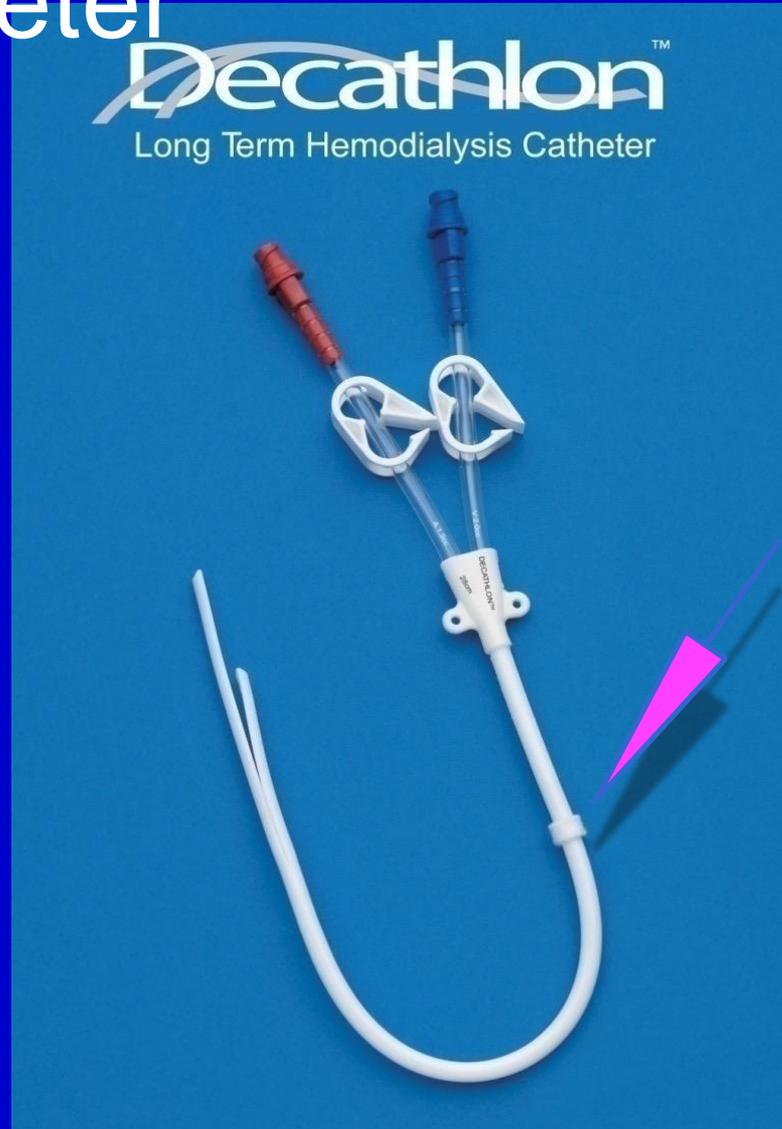
Bridgeraft



Fistel

CVK

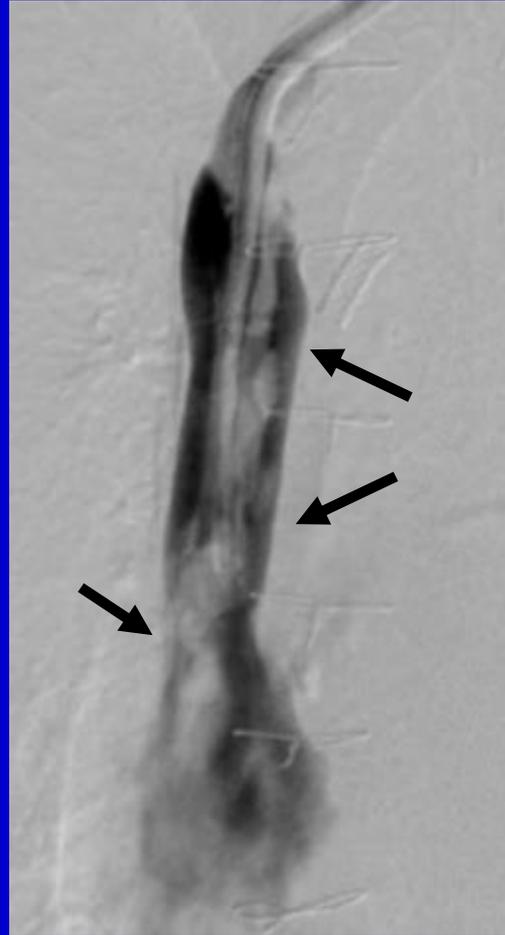
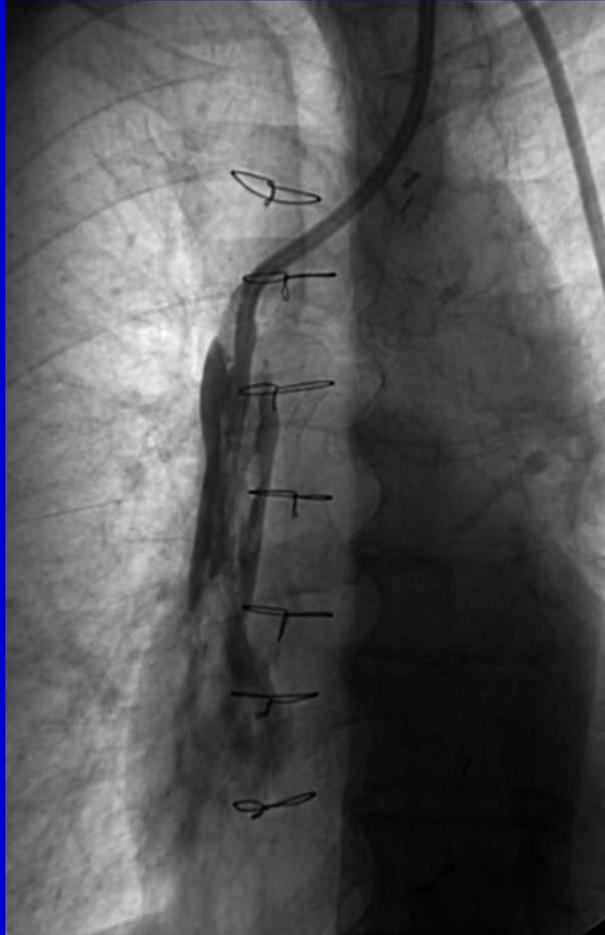
Permanent (tunneling) kateter



Infektion i permanent kateter



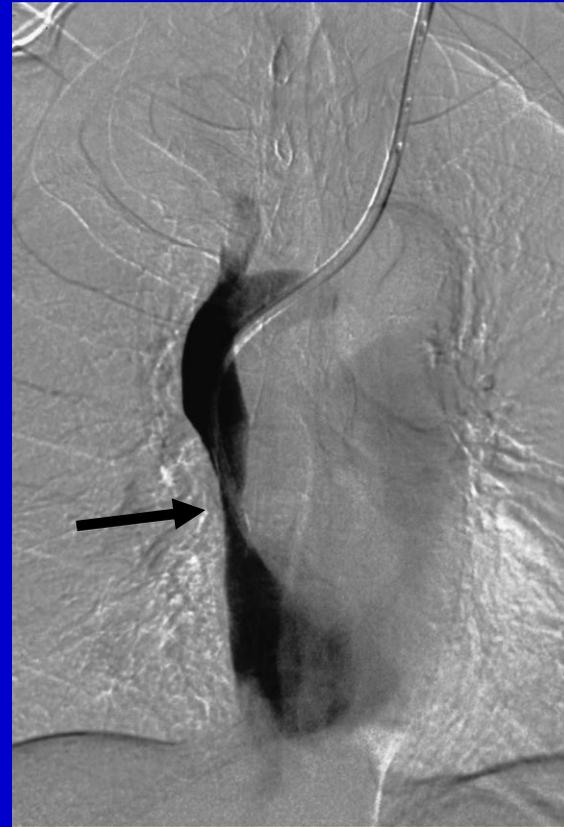
Trombos i kateter



Central Venous Stenoses due to Catheters



Stenosis at the
vein entry site

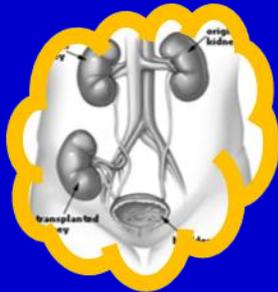
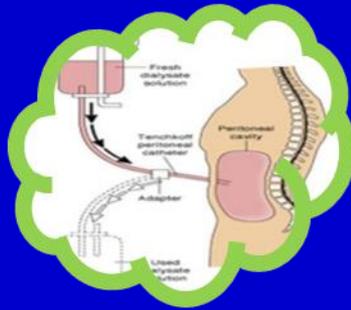


Stenosis at the
catheter tip site

Venous stenoses lead to venous occlusions



Multiple catheters lead to multiple occlusions



Transplantation

Kateter



Bridgeraft

Fistel



Først hæmodialyse
1924
George Haas
(1886 - 1971)



Dr. Willem Kolff



1943. "Rotation-drum" kunstig nyre

1966

Vol. 275 No. 20

CHRONIC HEMODIALYSIS—BRESCHIA ET AL.

1089

CHRONIC HEMODIALYSIS USING VENIPUNCTURE AND A SURGICALLY CREATED ARTERIOVENOUS FISTULA*

MICHAEL J. BRESCHIA, M.D.,† JAMES E. CIMINO, M.D.,‡ KENNETH APPEL, M.D.,§
AND BARUCH J. HURWICH, M.D.†

BRONX, NEW YORK

THE NEW ENGLAND JOURNAL OF MEDICINE [Vol. 275 No. 20 1966](#)

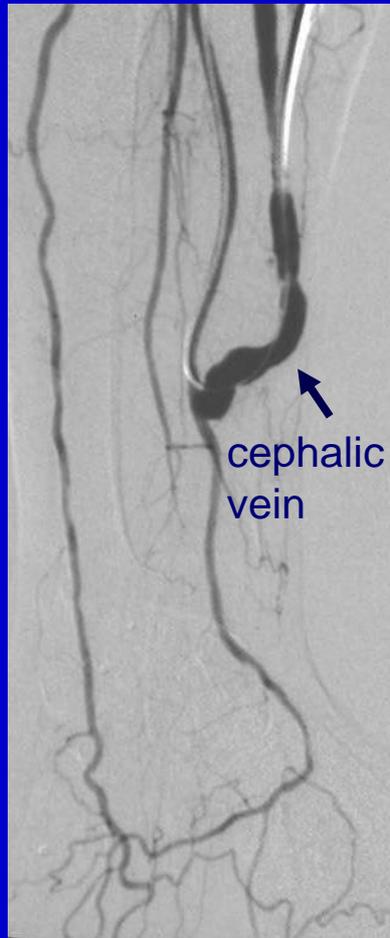
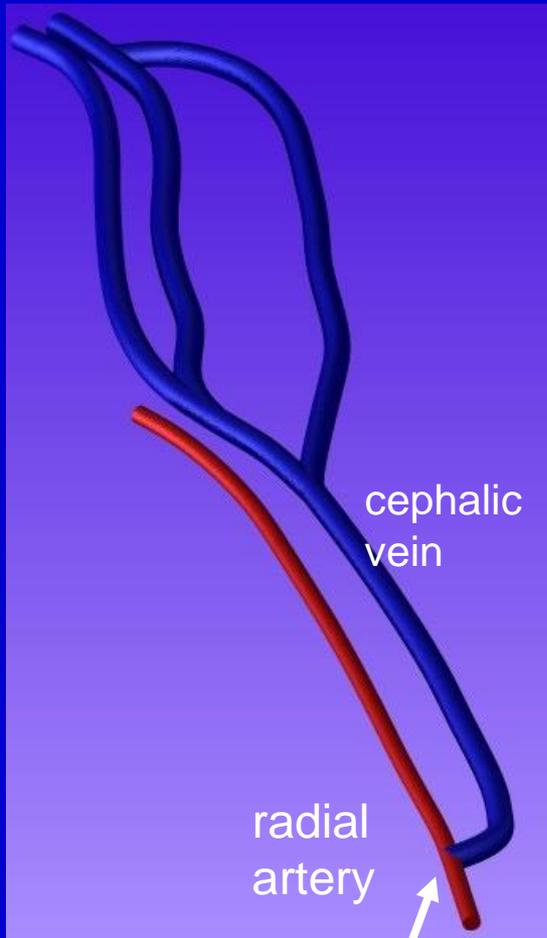
**Only 2 fistulas failed
in initial 14 patients.
Blood flow of 200 –
300 ml/min was
achieved in 12 pts**



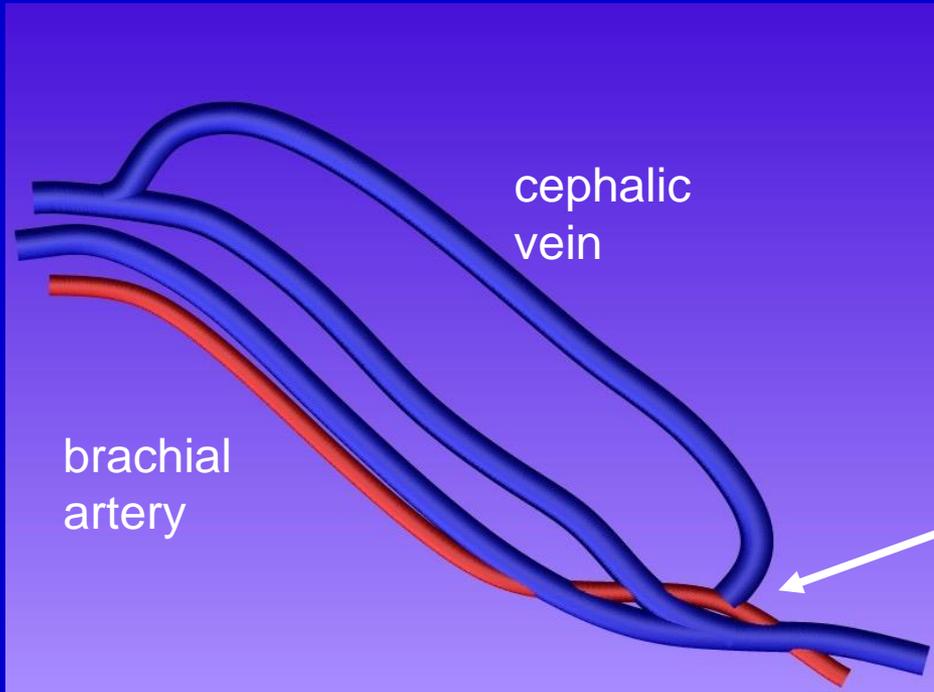
Cimino

Appel

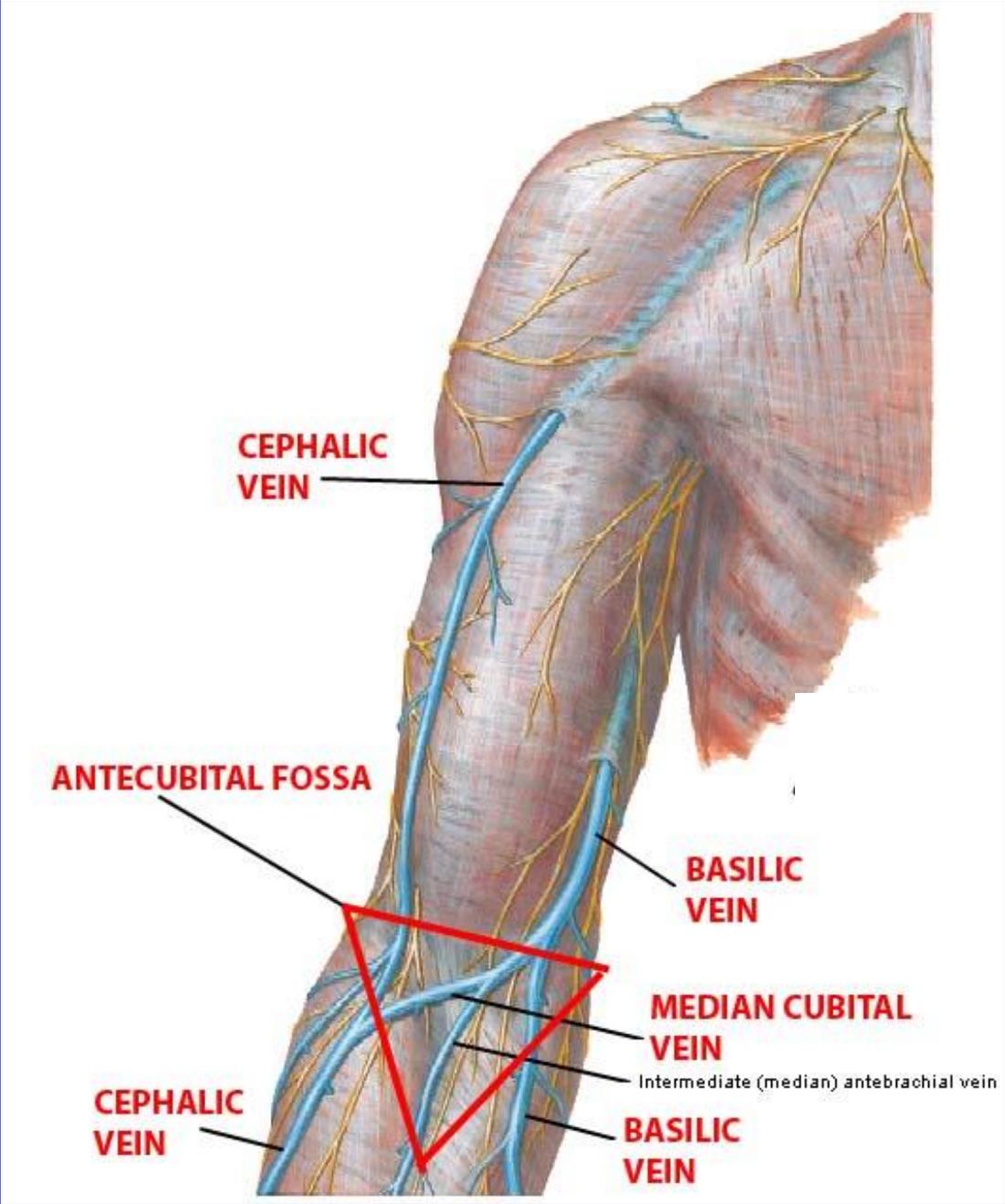
Brescia



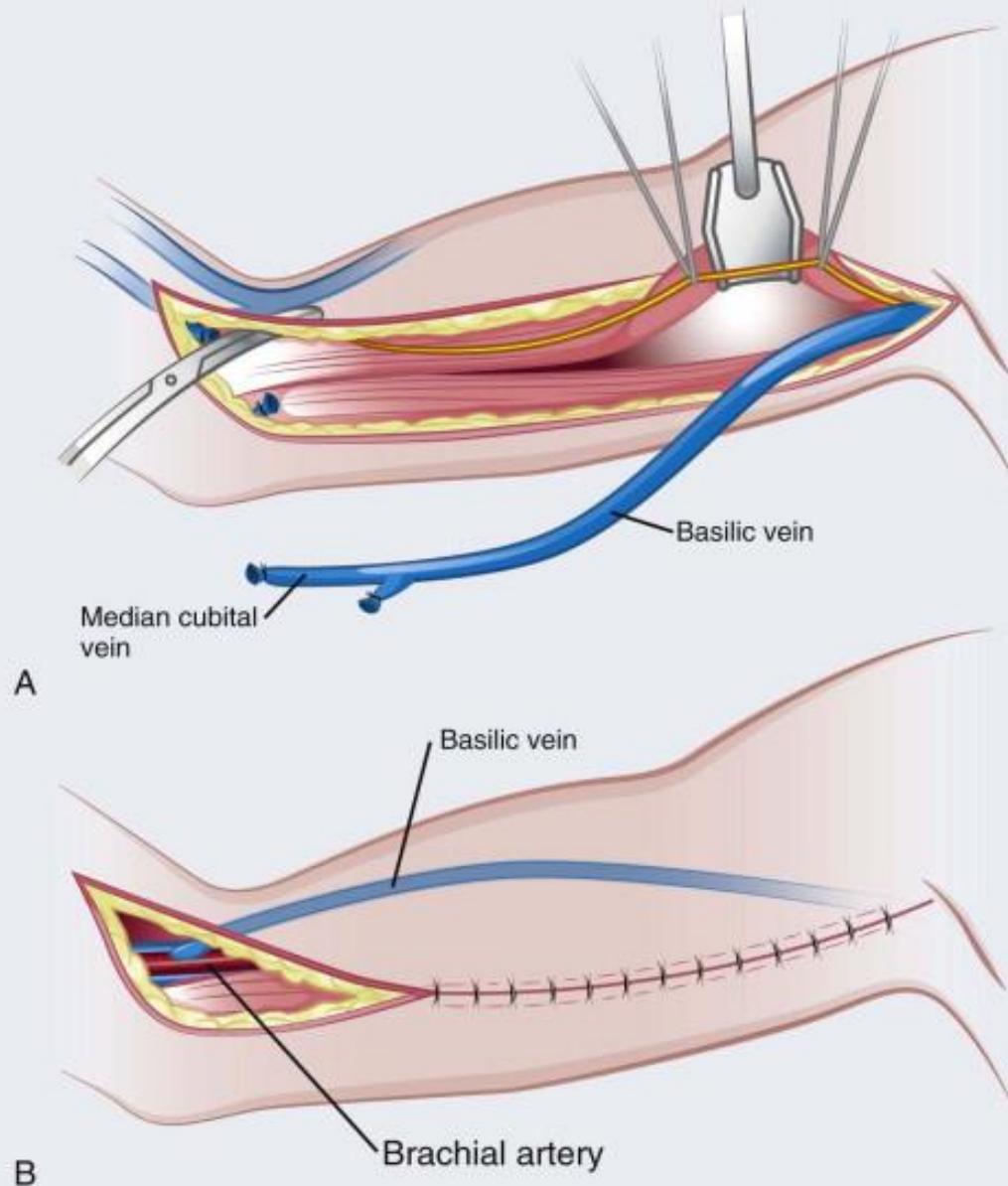
Radiocephalic fistula



Brachiocephalic fistula

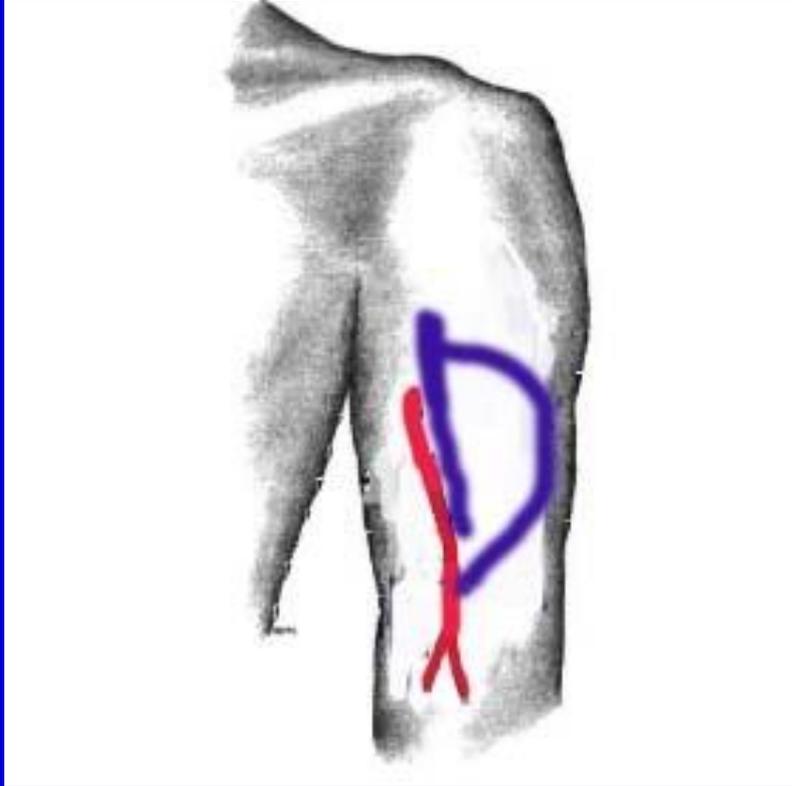


Transposed Brachiobasilic AV Fistula

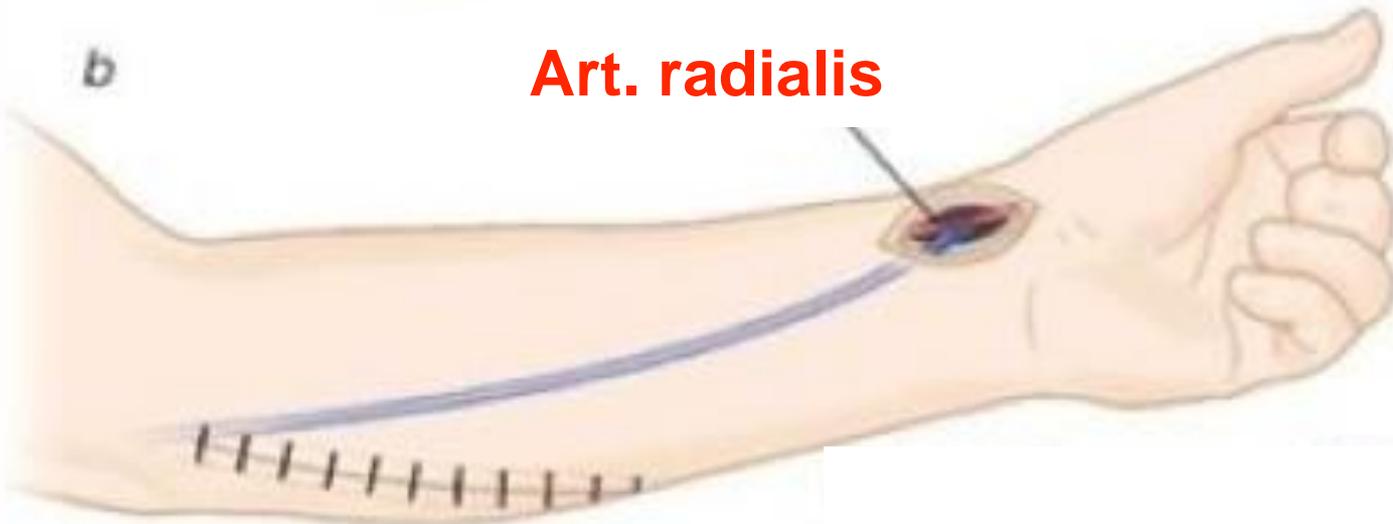
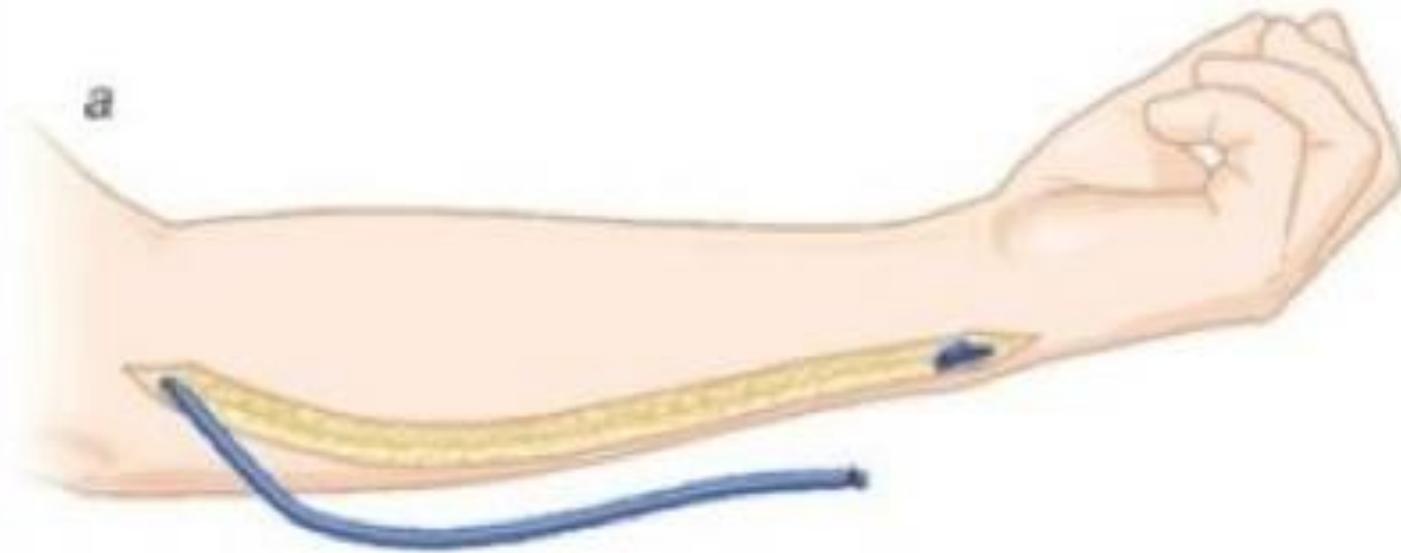




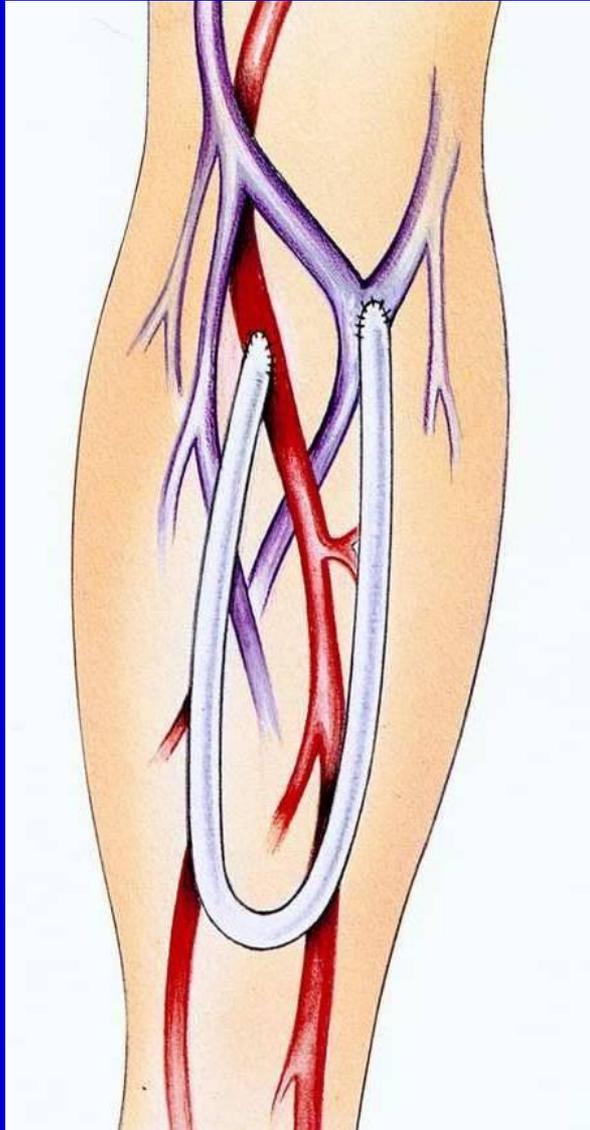
Transposition vene basilica Dagher fistel

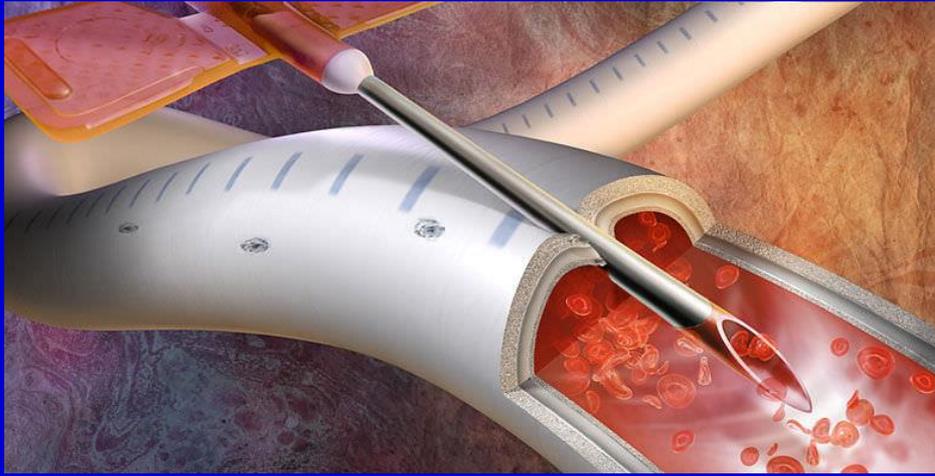


Transposition v. basilica

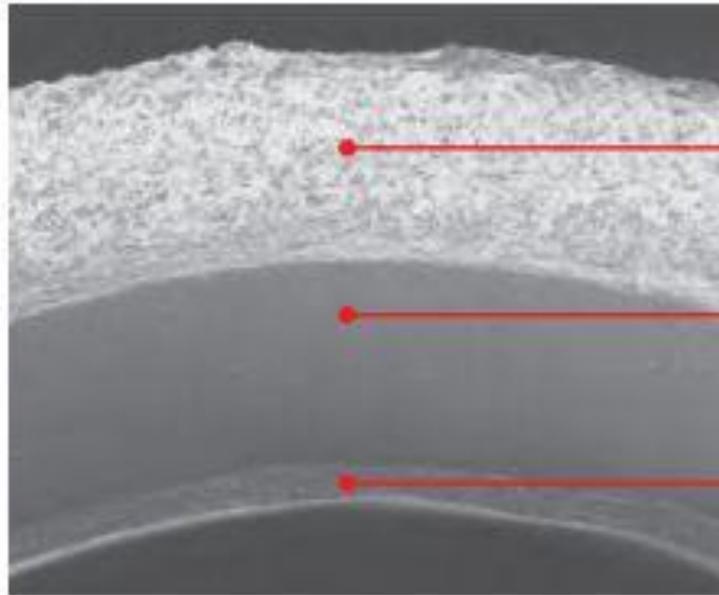


Bridgegraft





Tri-Layer Construction of a GORE® ACUSEAL Vascular Graft



Abluminal layer:
ePTFE graft

Elastomeric layer

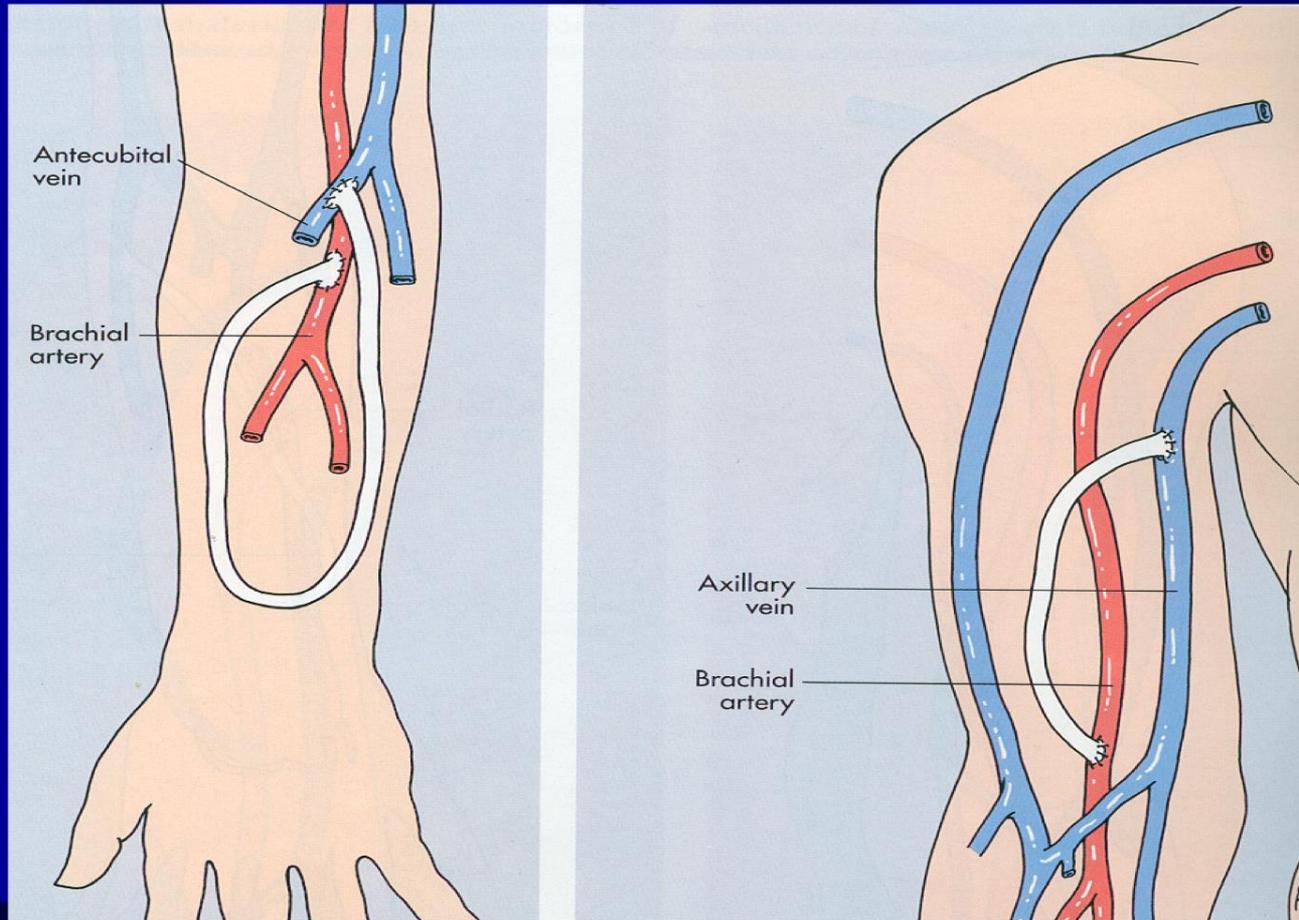
Luminal layer:
ePTFE with CBAS
Heparin Surface

500x magnification
100μ

Omniflow® II Biosynthetic Vascular Prosthesis*



Arm PTFE Grafts

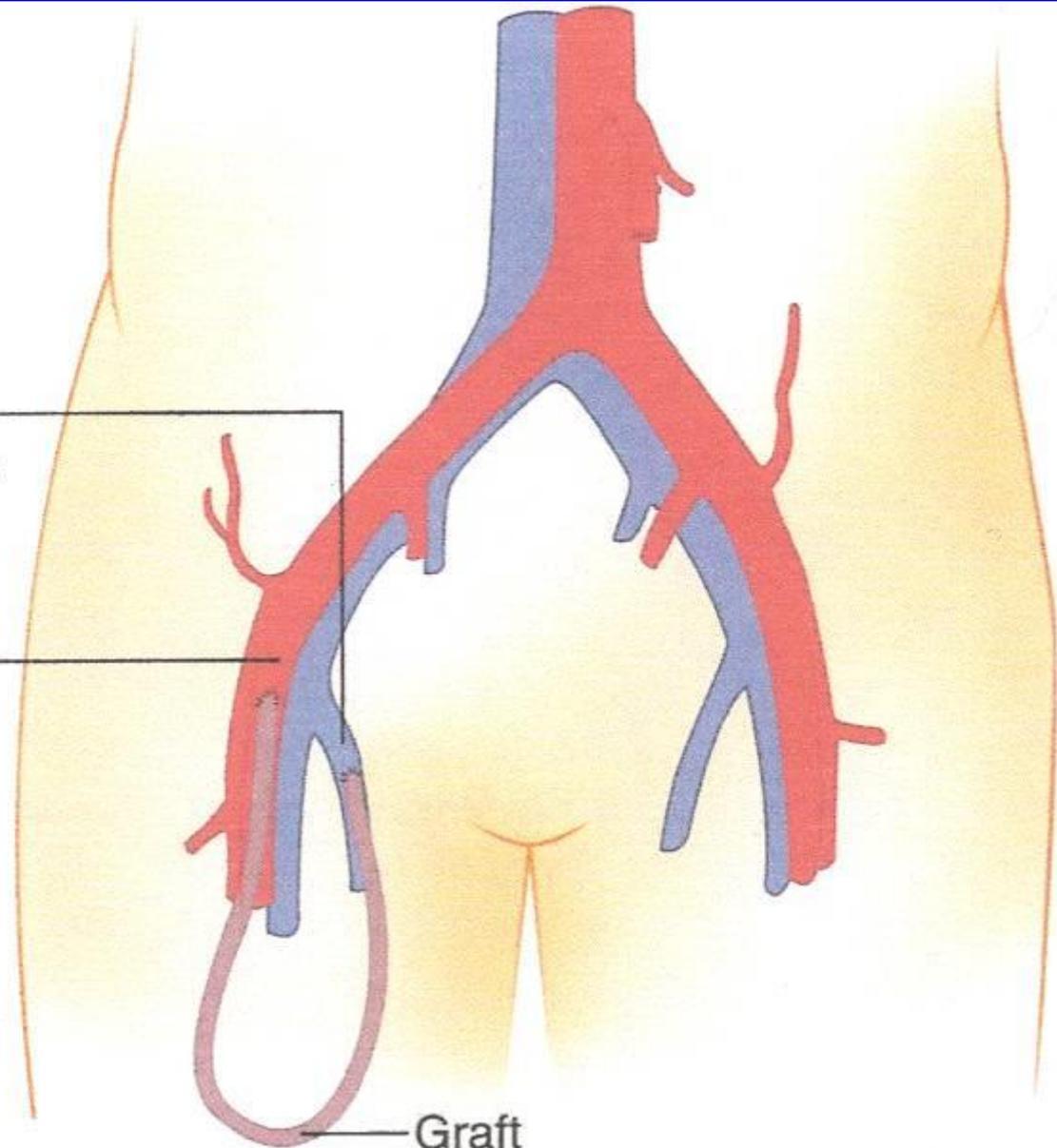


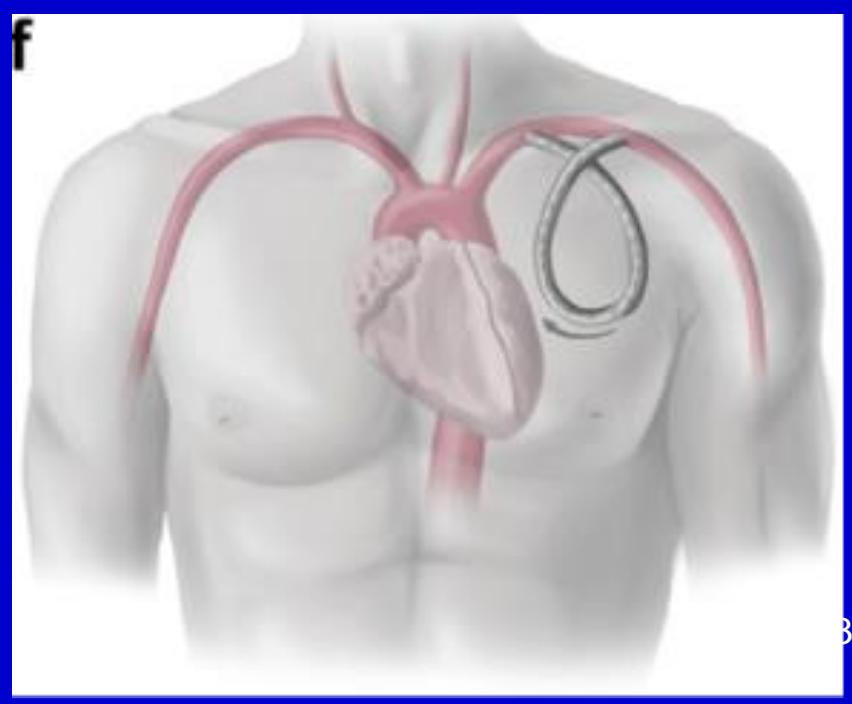
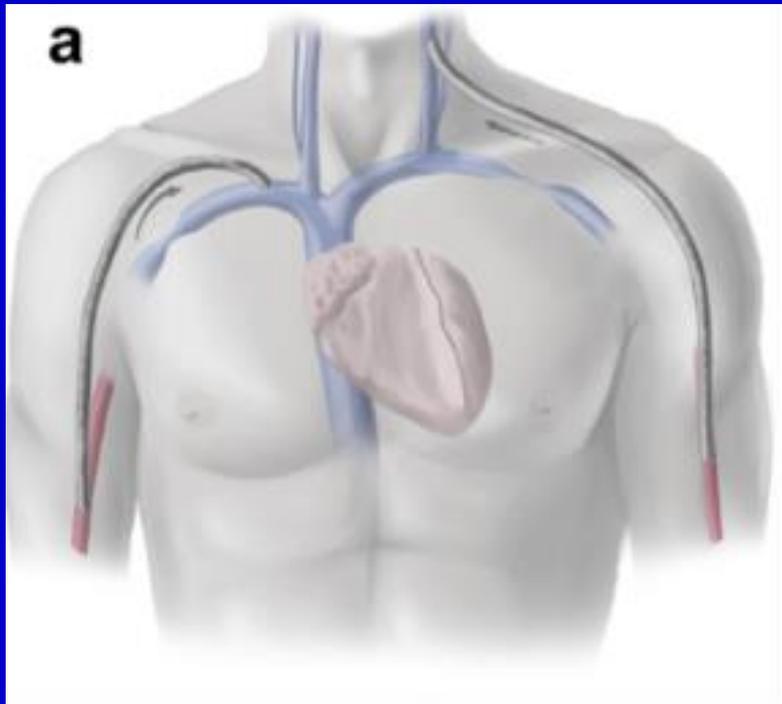
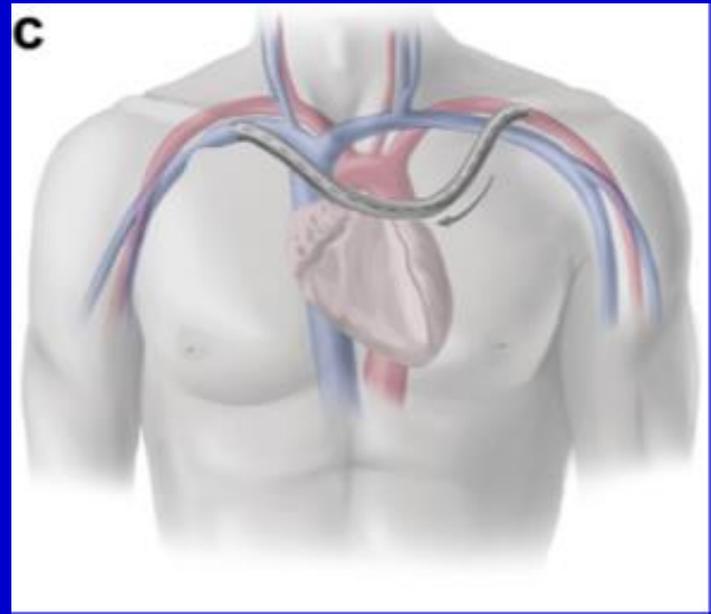
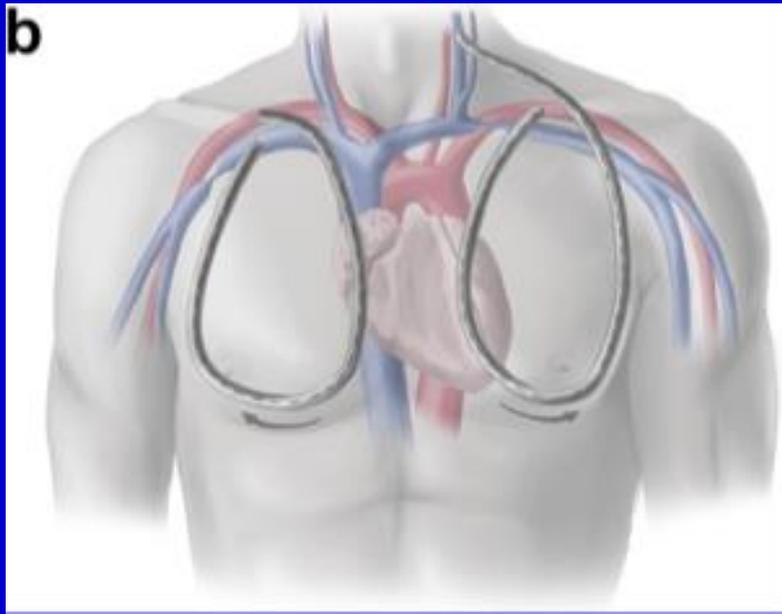
Drawing courtesy of James F. Whiting, MD

Greater saphenous vein

Common femoral artery

Graft







Arterio-venous fistel skal indlægges **2-3 mdr.** før hæmodialyse.



Bridgeraft **2-3 uger** før hæmodialyse. Eller akut

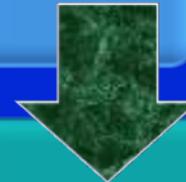


Permanent kateter skal indlægges **midlertidig** til brug.

Radiocephalic fistel



Brachiocephalic fistel



Brachiobasilic fistel med
transposition

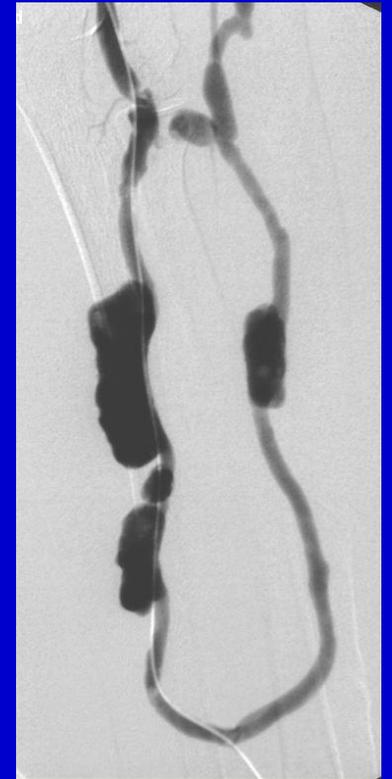
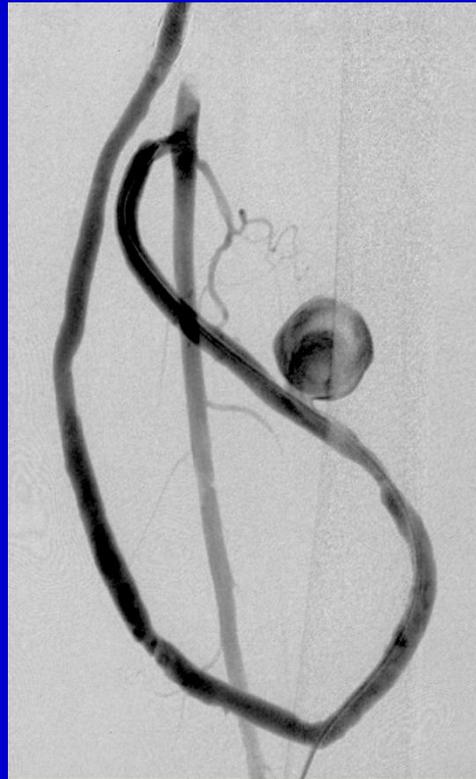
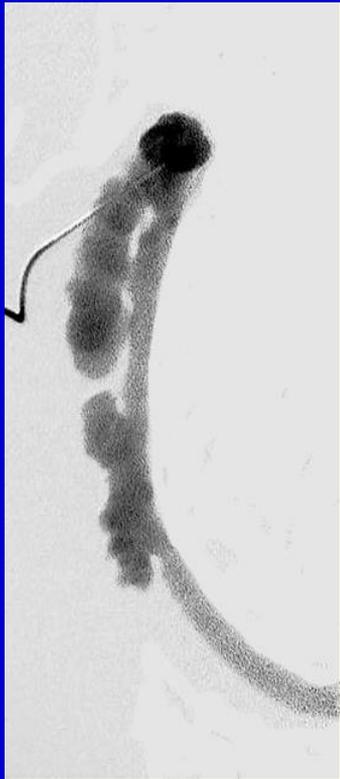


Bridgegraft



**Infektion i graft eller fistel er absolut
kontraindikation til dialyse procedure**

Pseudoaneurysmer i graft





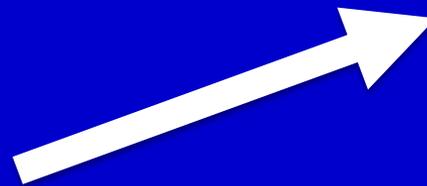


Modning af fistel



Modning af fistel

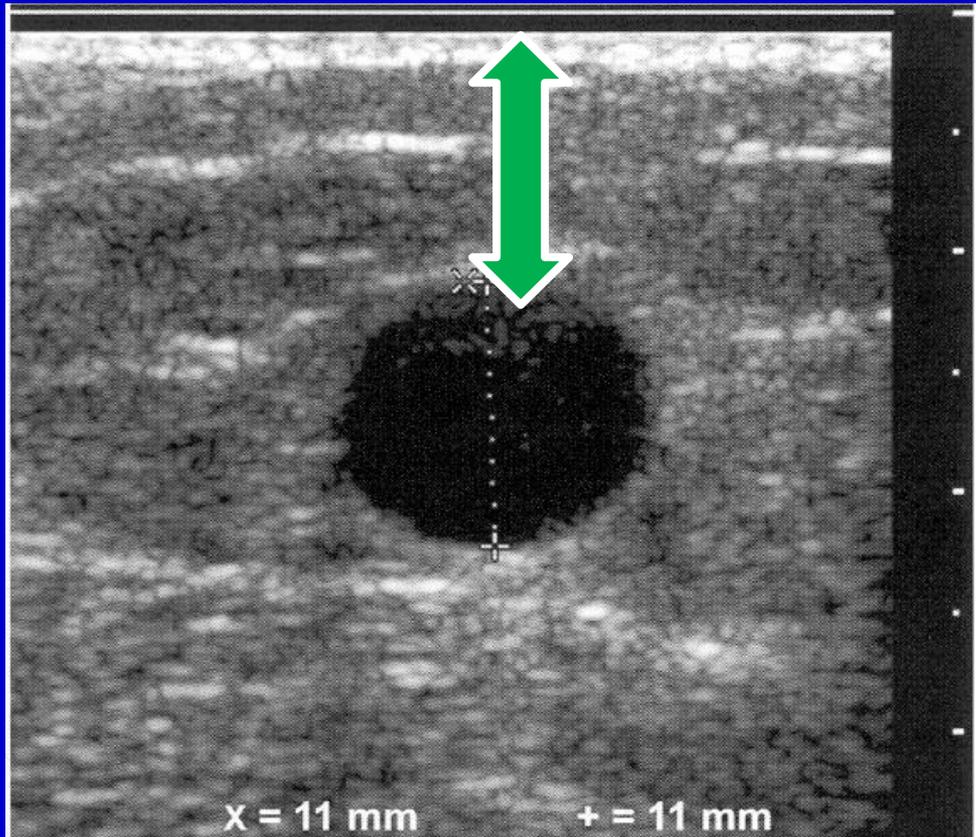
2 mm



6 mm

om 2-3 måneder

Cephalic Vein



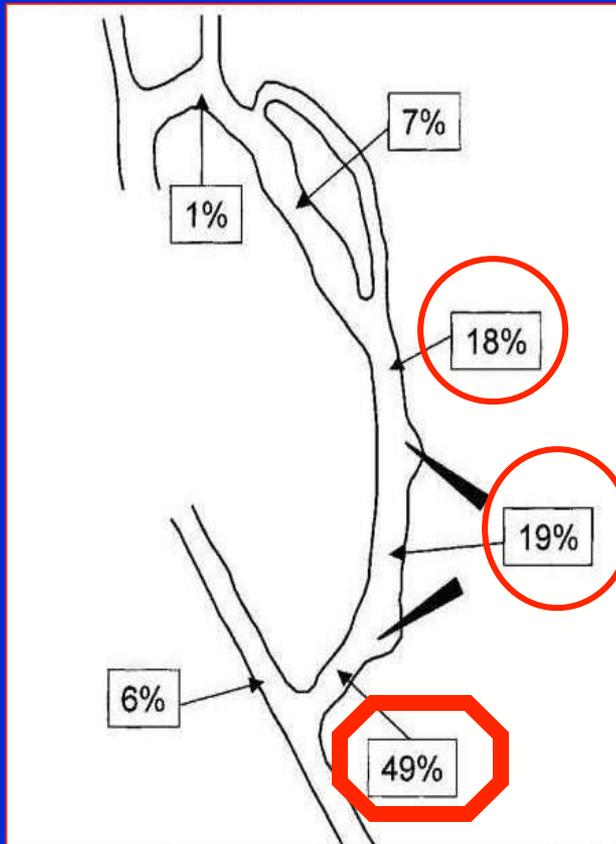
< 6 mm dyb

Komplikationer

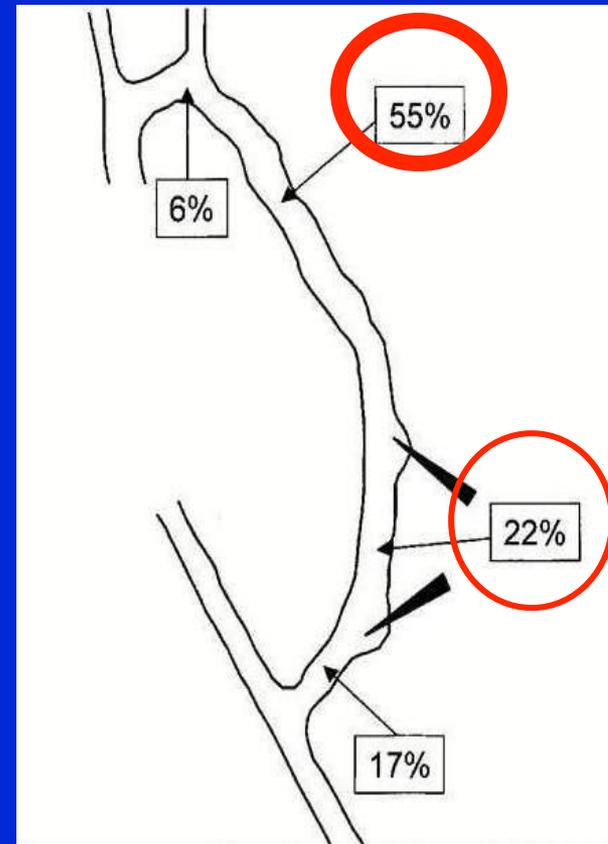
- **Dårlig modning i fistel**
- **Stenose i vene**
- **Stenose i arteria**
- **Trombos**
- **Steal sygdom**
- **Hjerteinsufficiens**
- **Aneurismedannelse**
- **Blodning**
- **Ødem**
- **Central venous stenose**
- **Central venous occlusion**

Stenose

Location of Stenoses in Native Fistulae



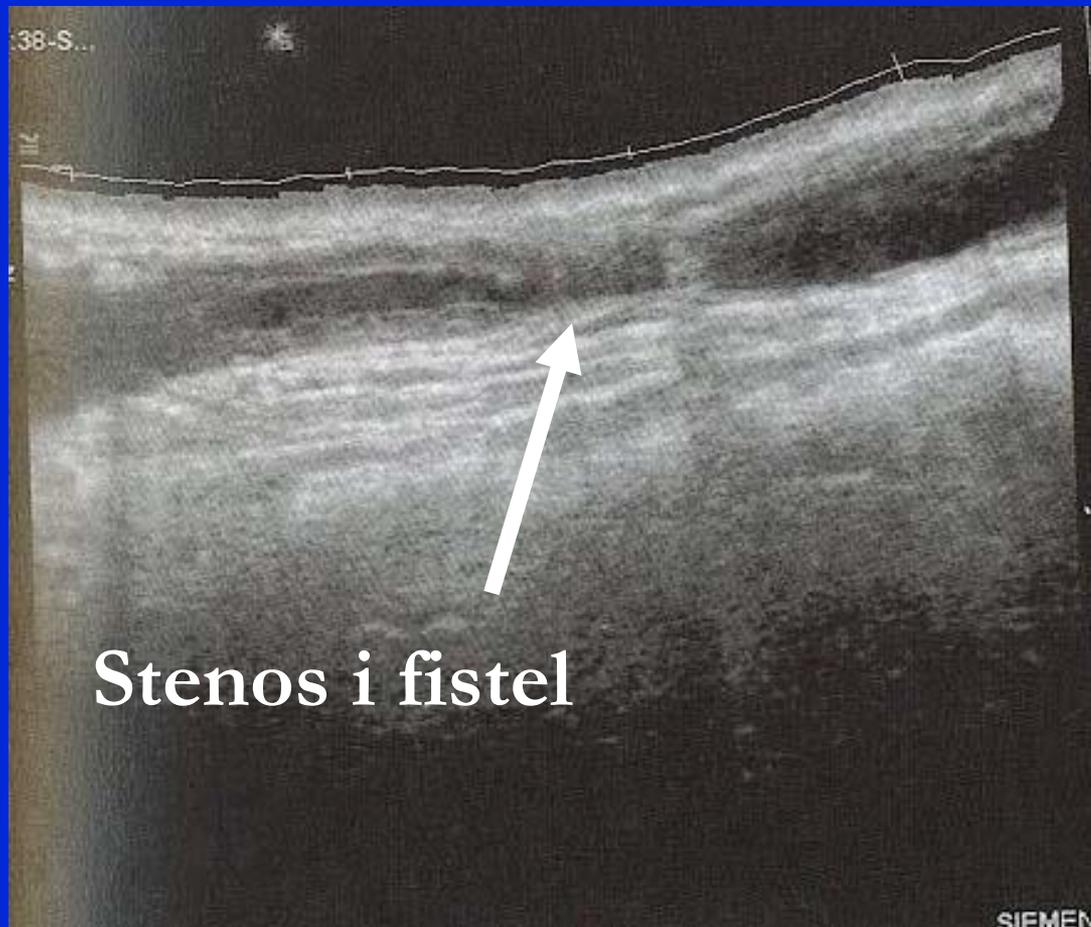
Radiocephalic



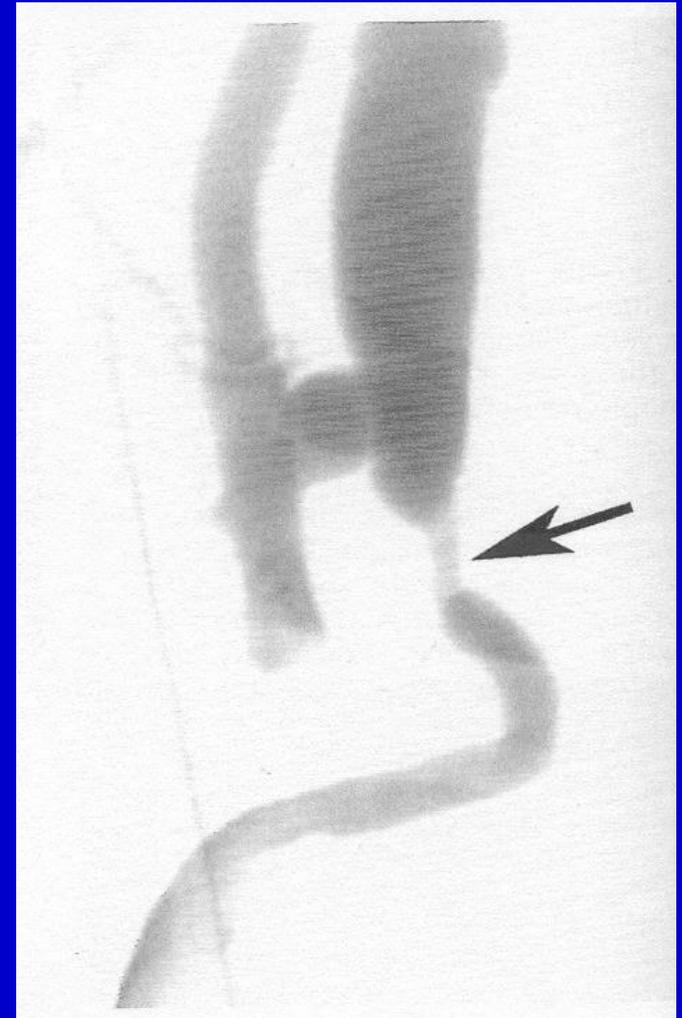
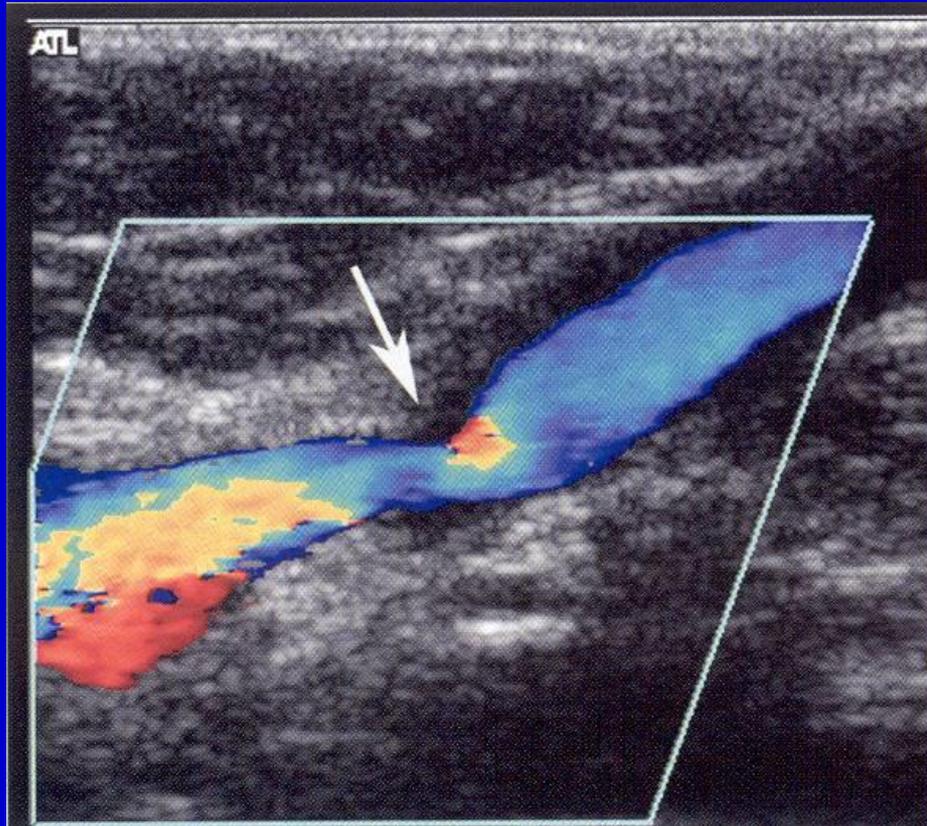
Brachiocephalic

Duplex scanning

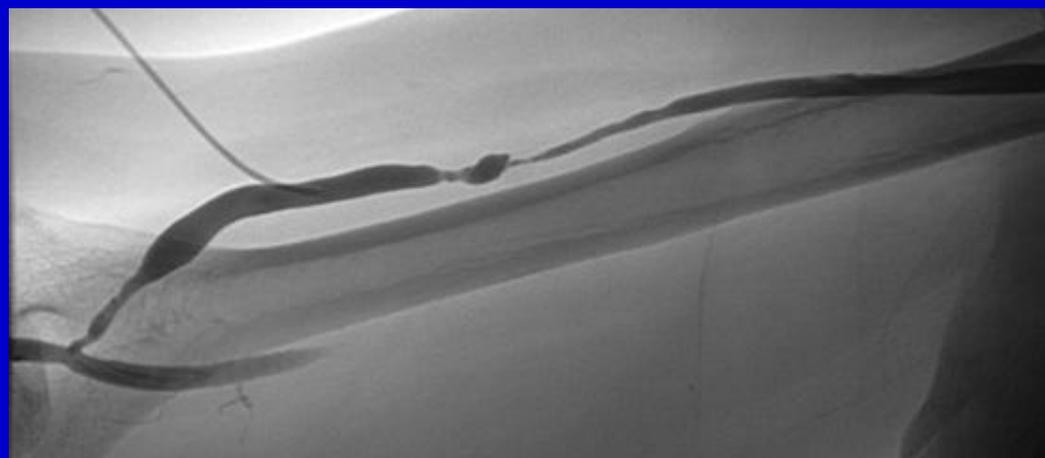
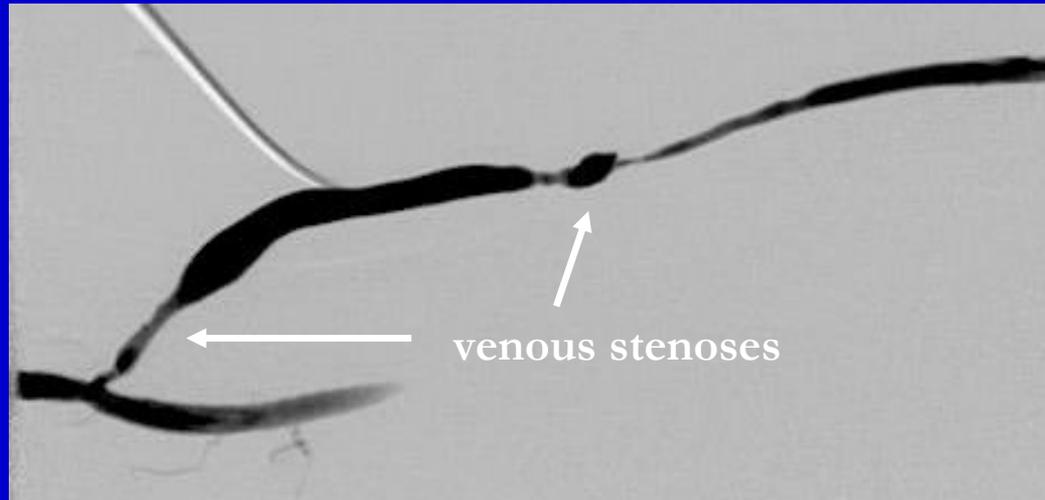
Stenos i fistel



Duplex scanning Stenos i fistel

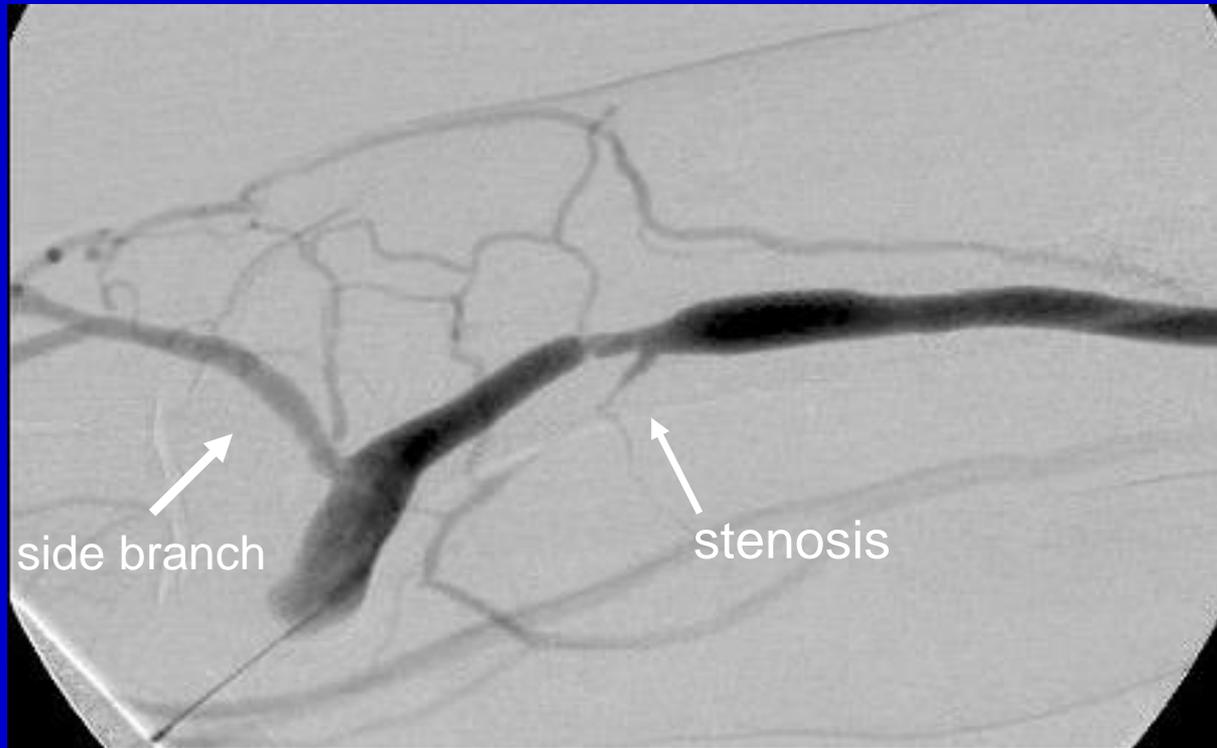


Accessografi. Venous stenosis



Accessografi

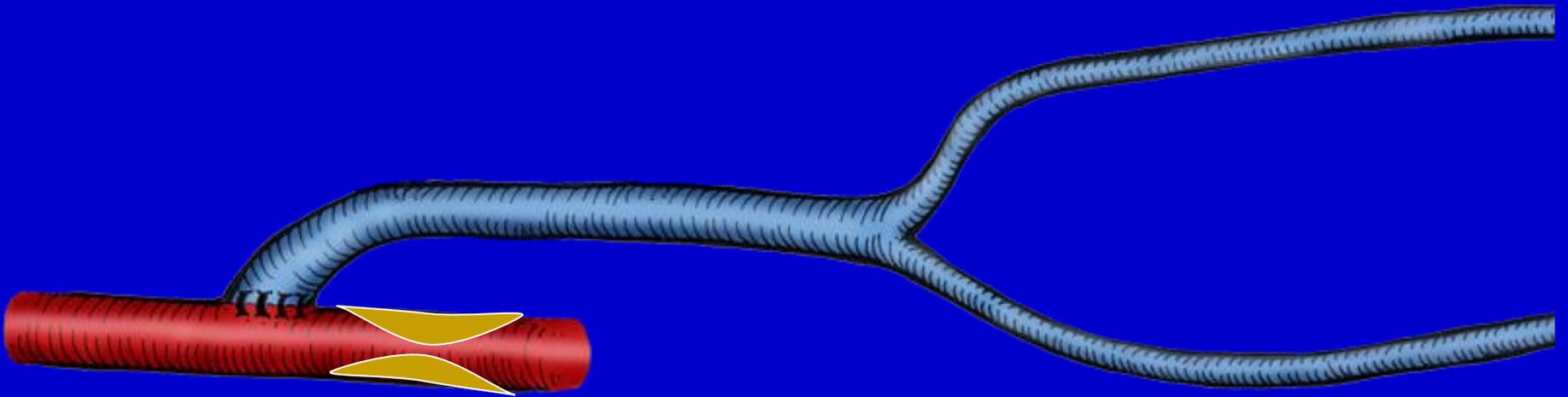
Venous stenosis + sidegren



Central venous stenosis med venous hypertension

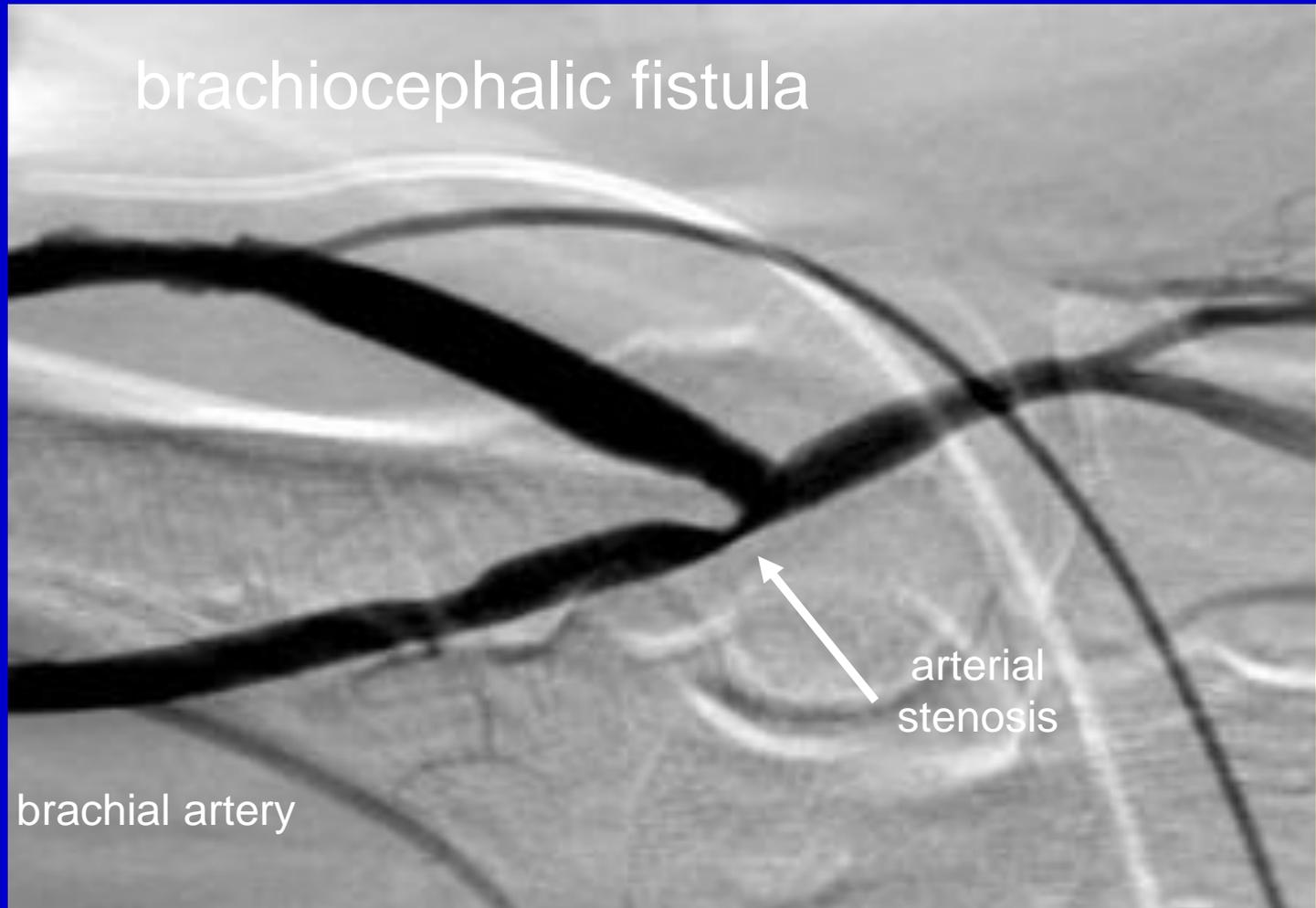


Arterial Stenosis

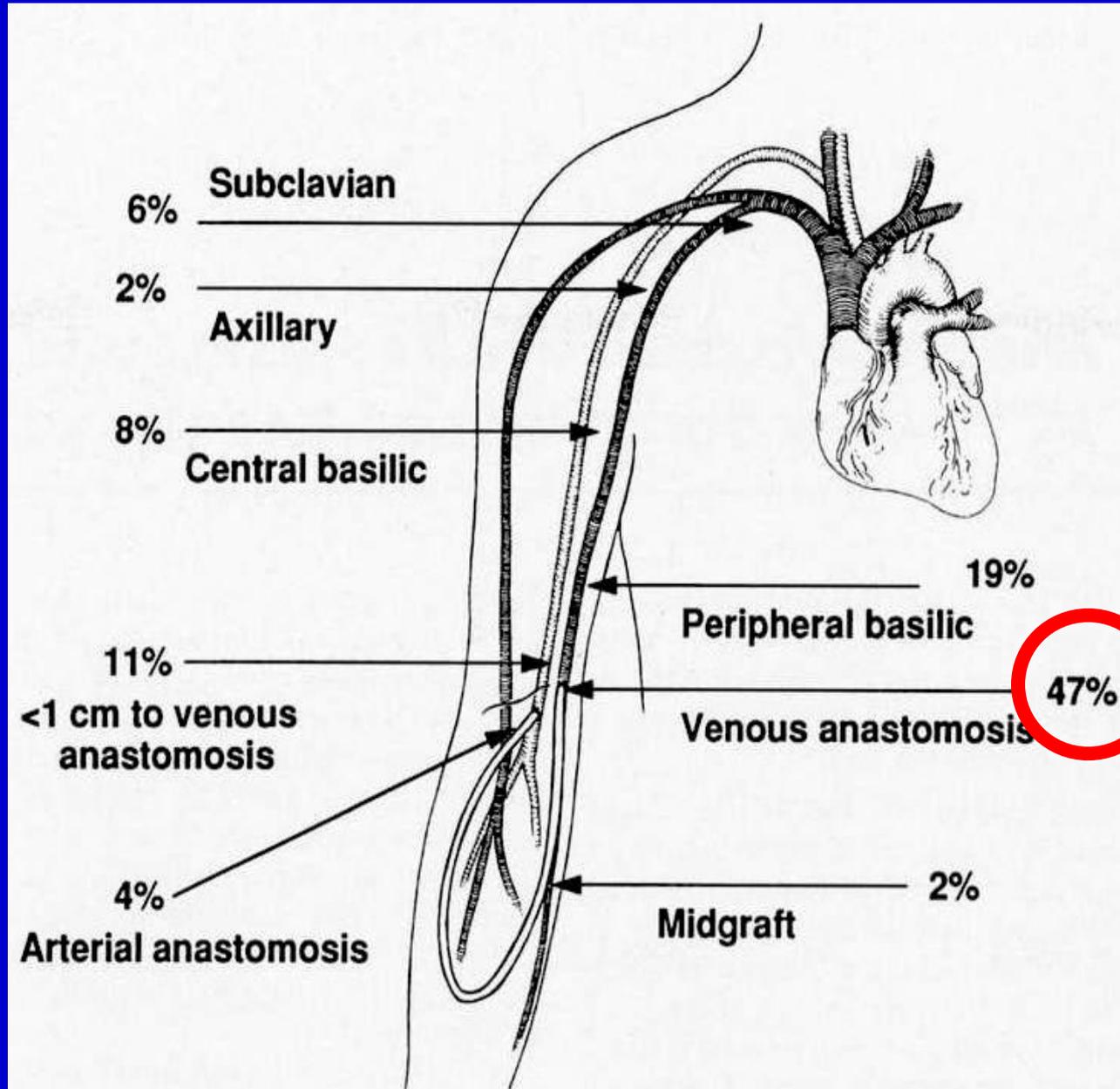


brachial artery
stenosis

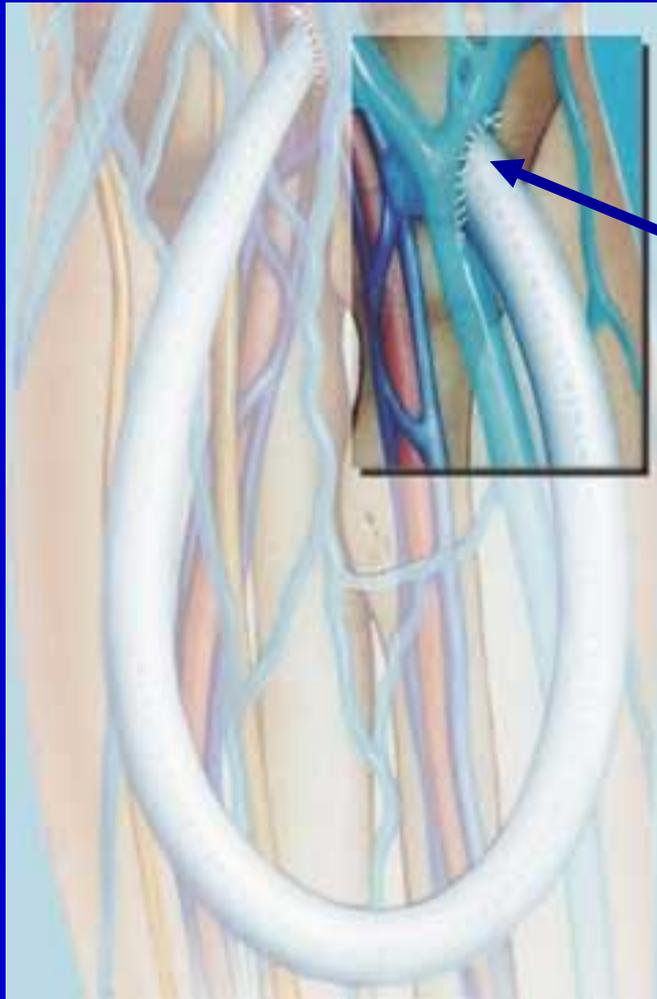
Arterial stenosis



Stenose i Bridgegraft



Hemodialysis Graft Stenosis



stenosis
at the
venous
anastomosis



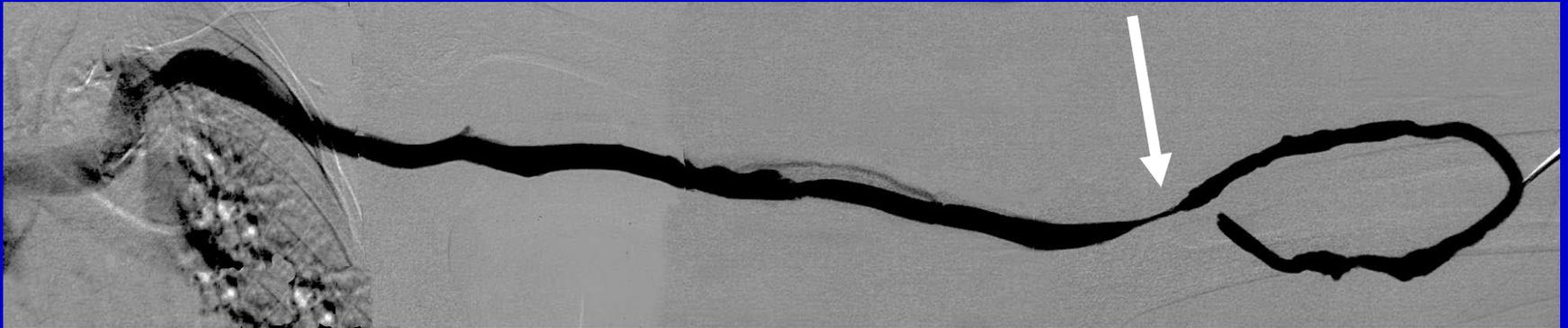
Hemodialysis Graft Stenosis

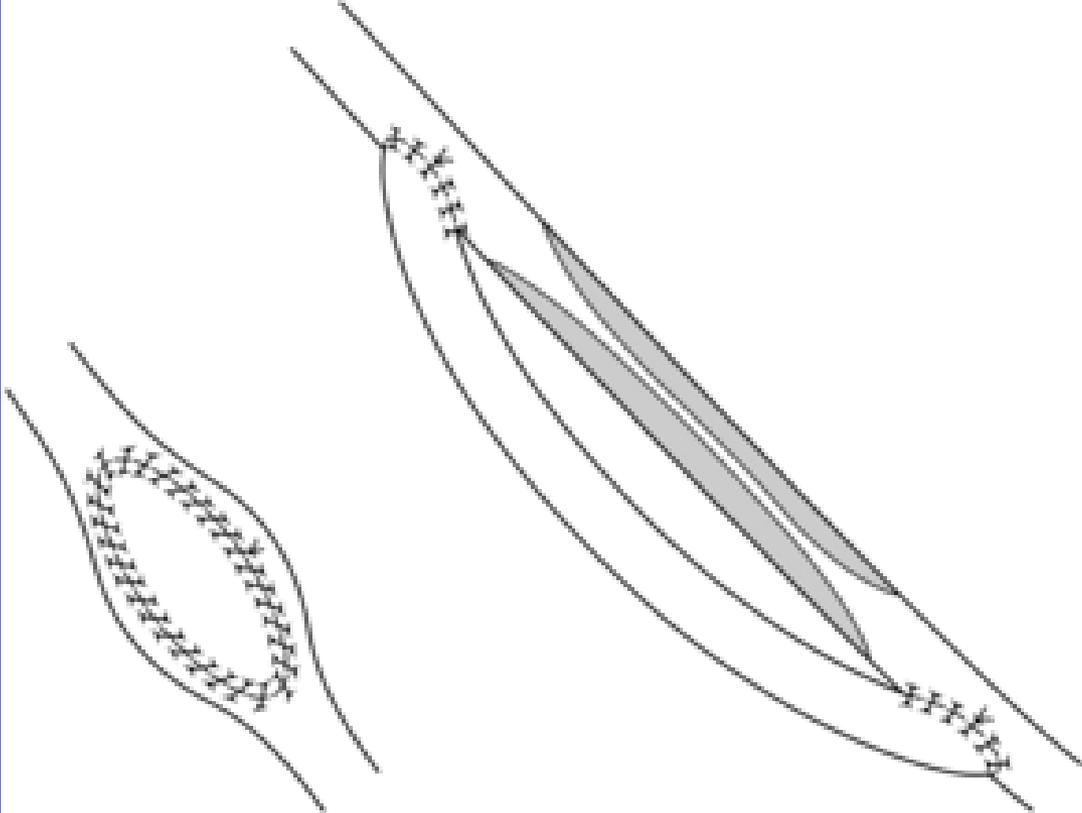


stenosis
at the
venous
anastomosis

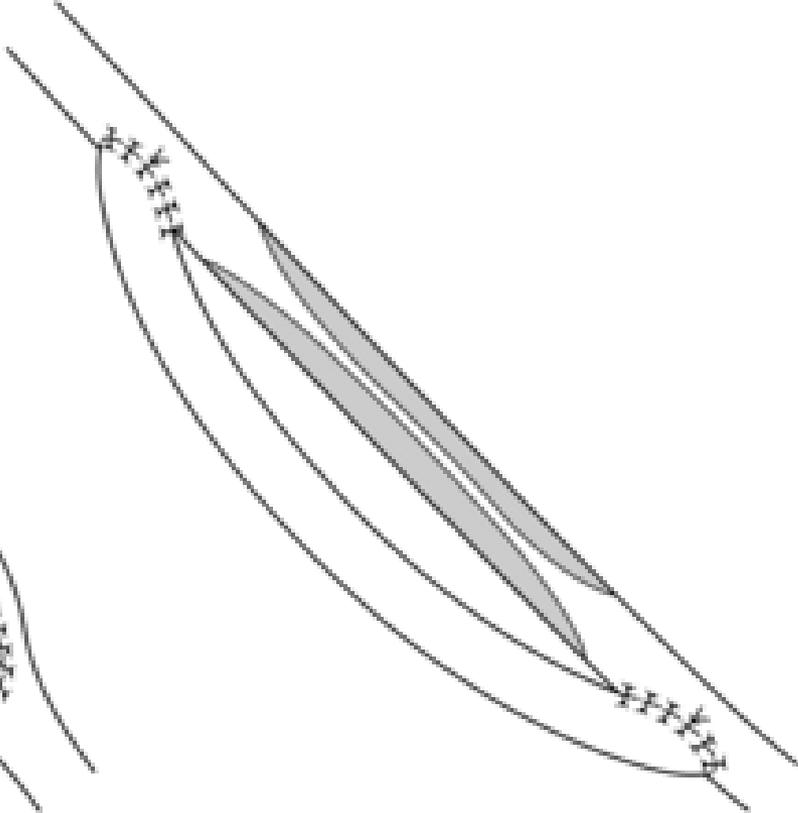


Hemodialysis Graft Stenosis. Accesografi

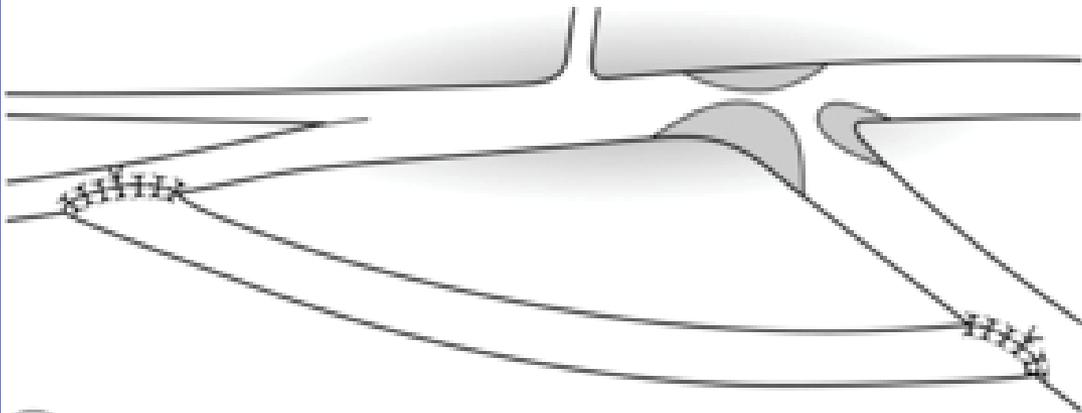




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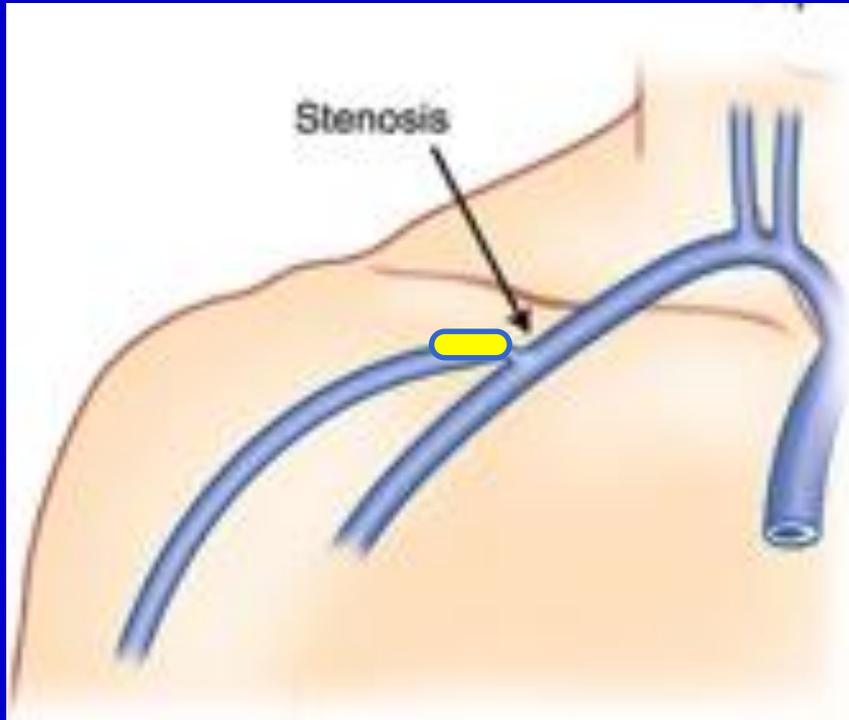


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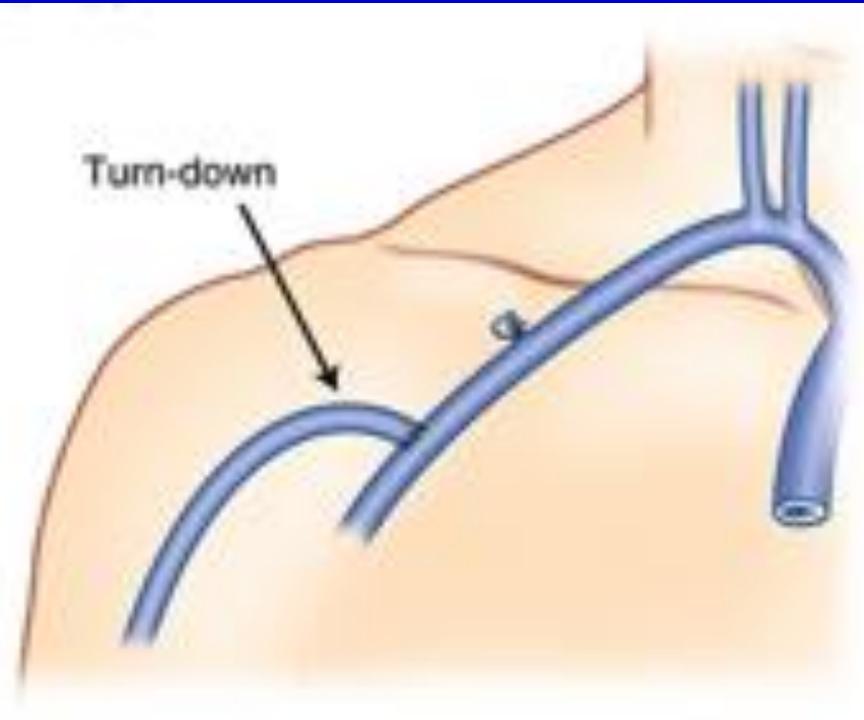


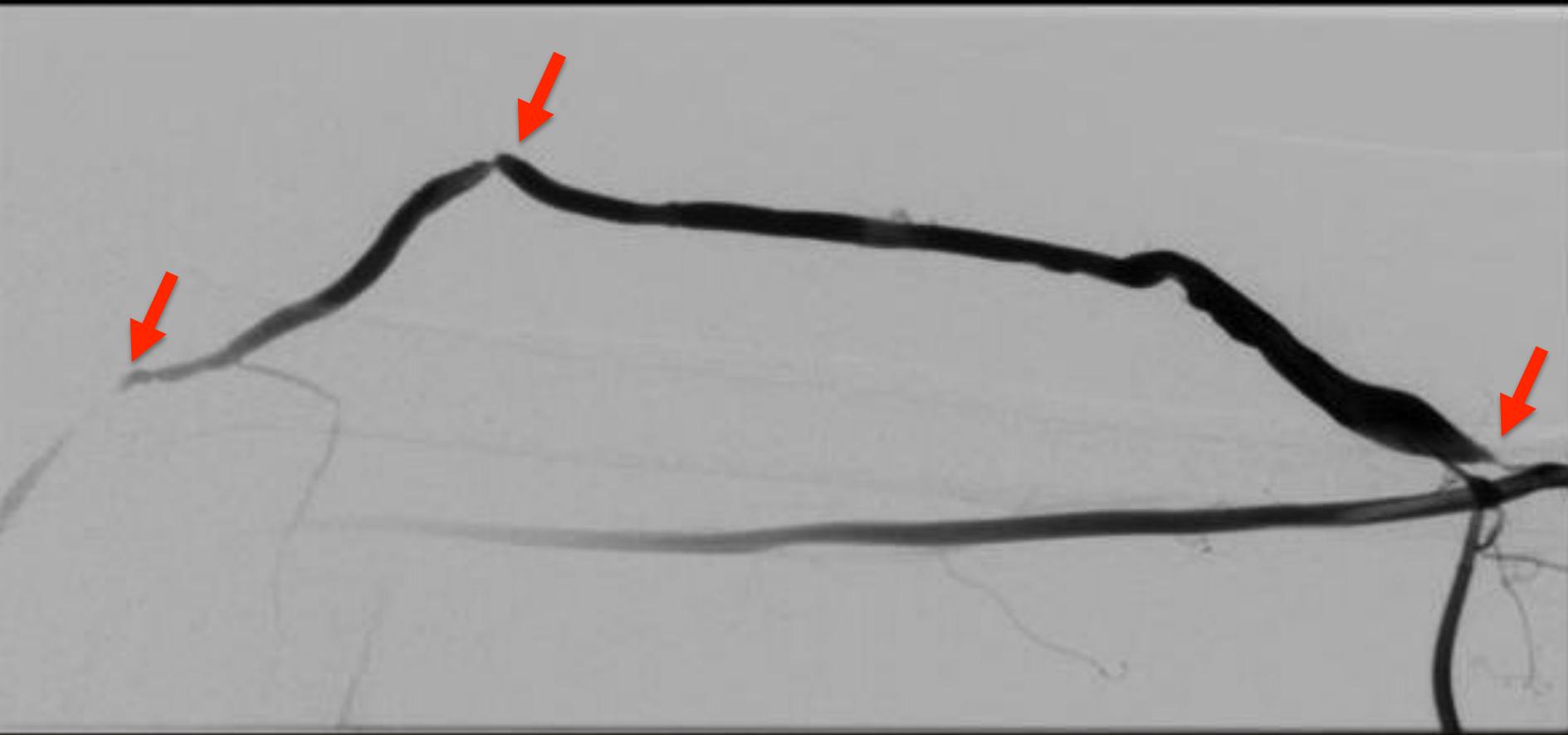
c

Stenosis

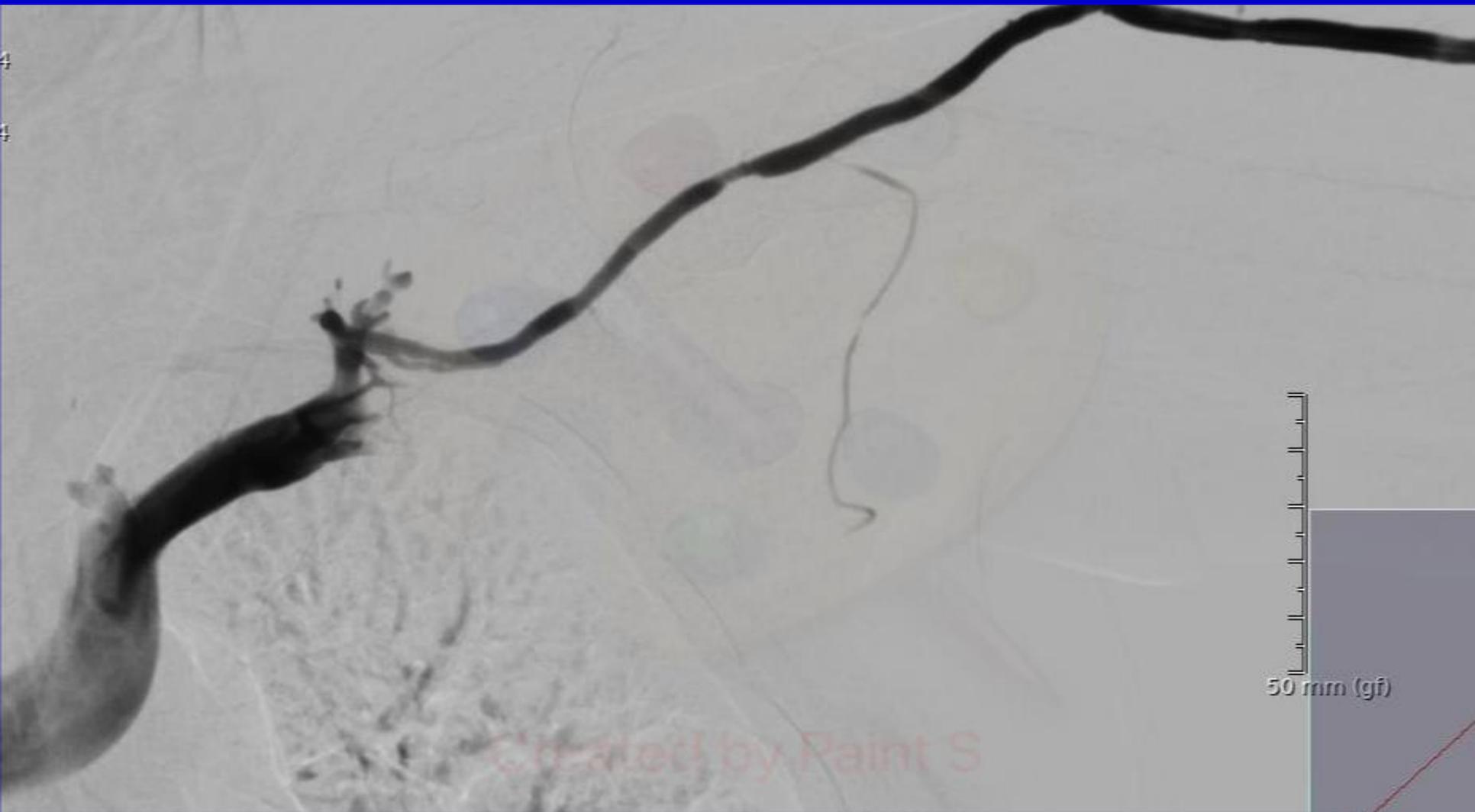


Turn-down





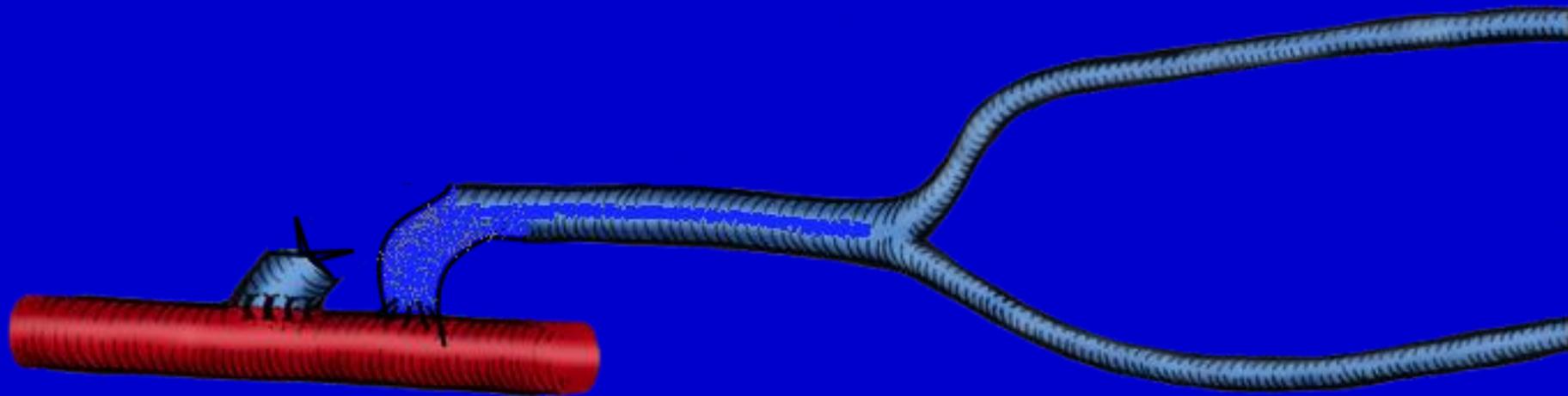
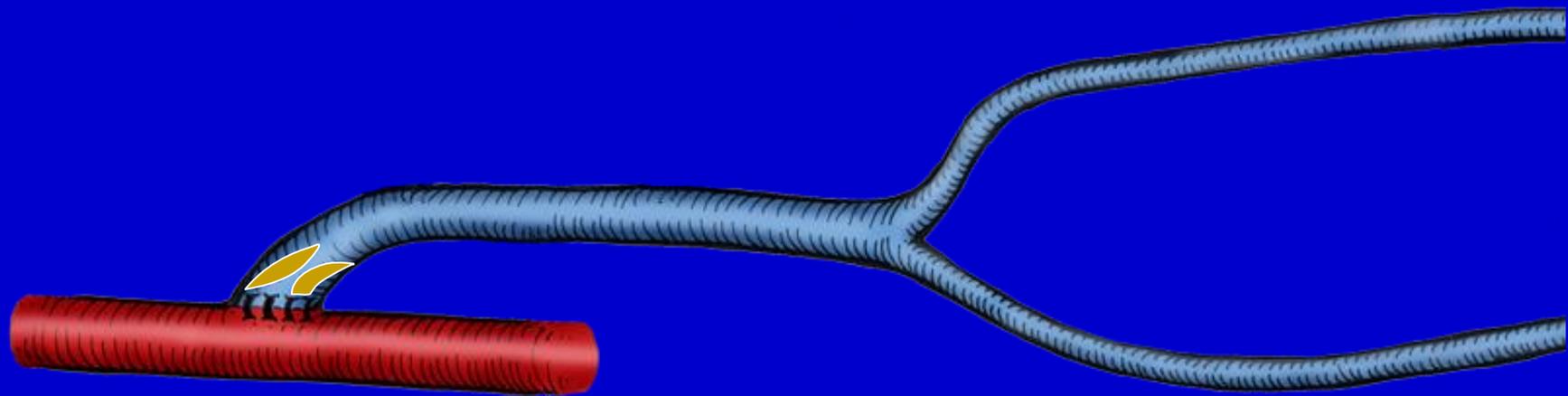




50 mm (gf)

Created by Paint S

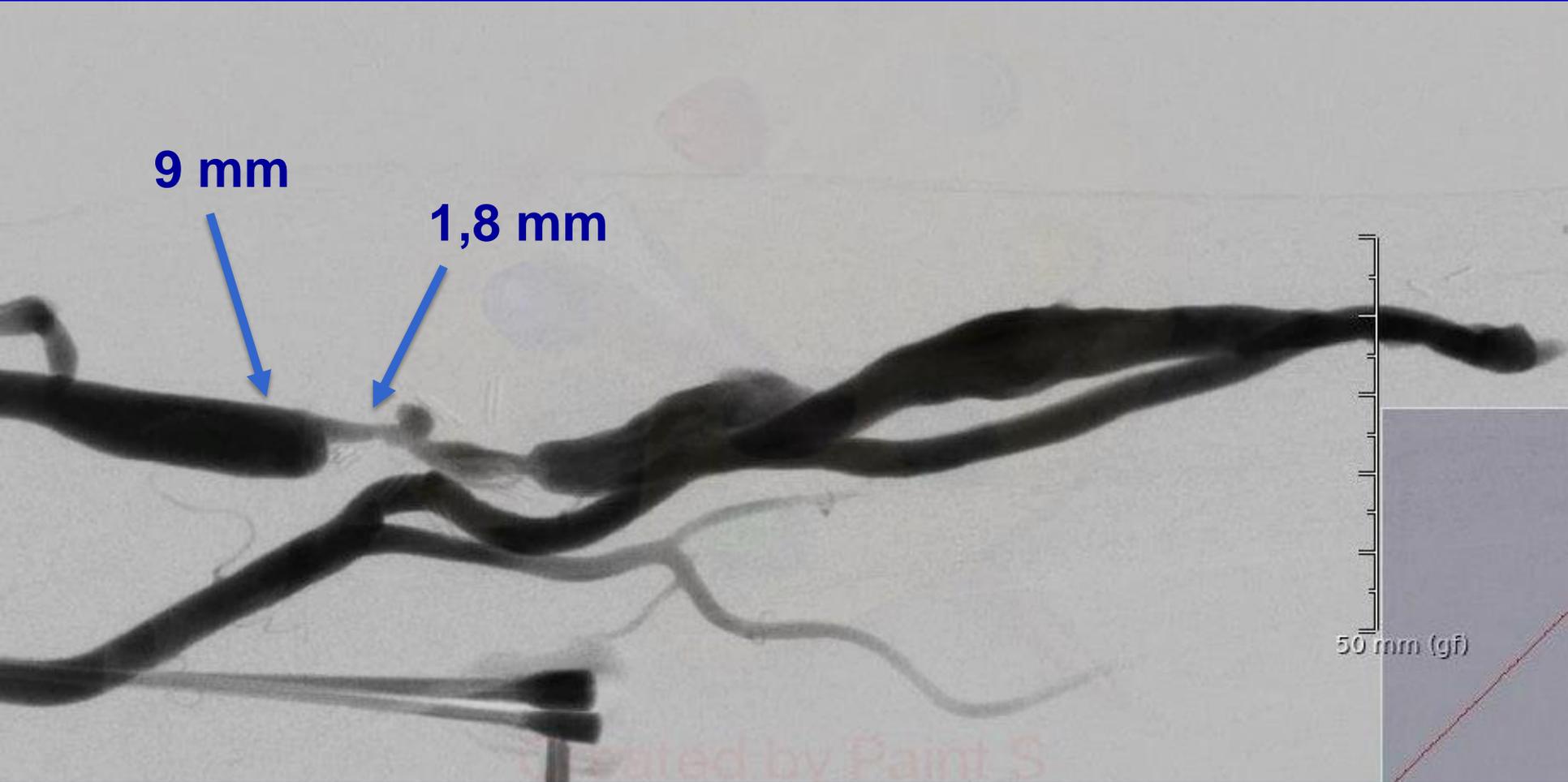




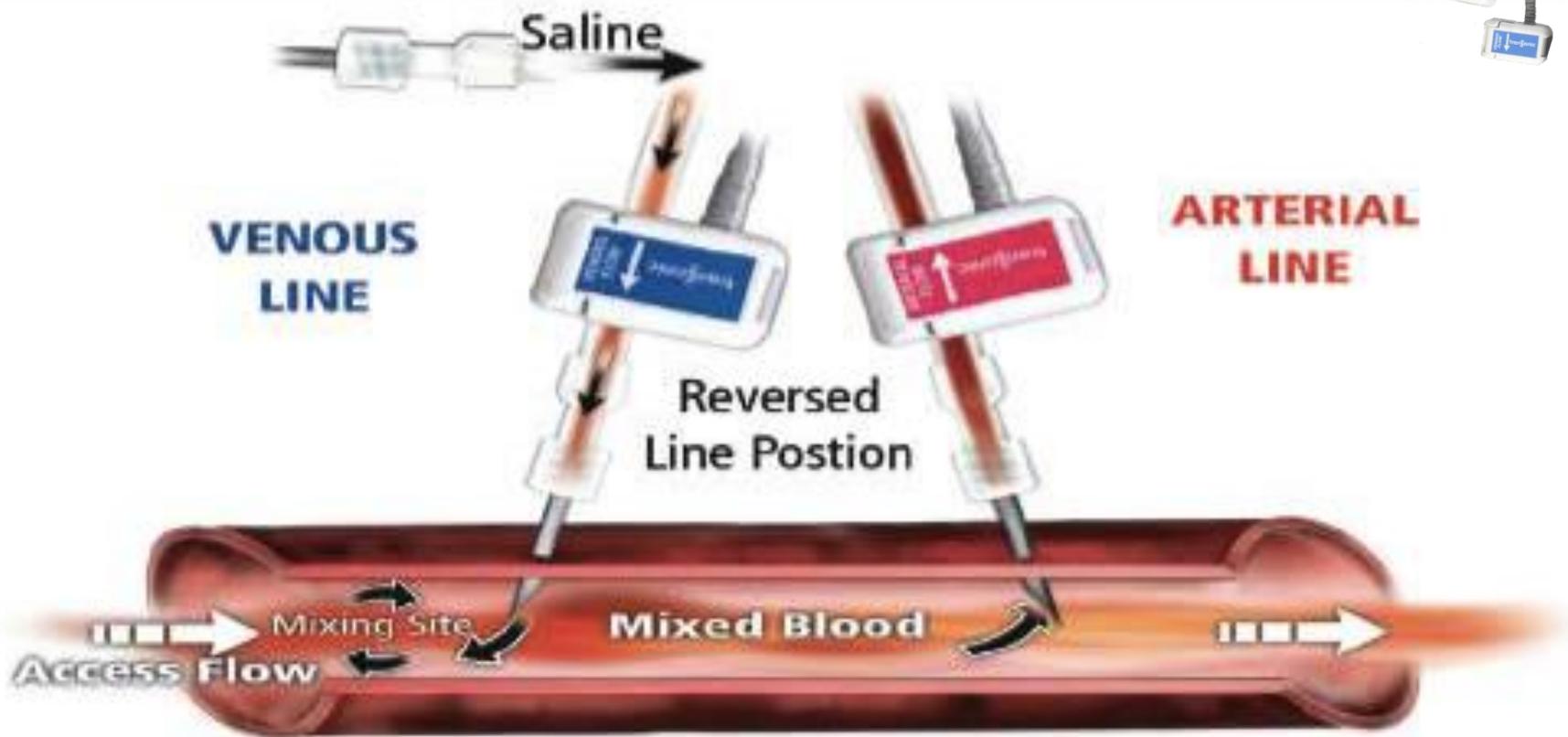
9 mm

1,8 mm

50 mm (gf)



Transonic





Transonic



Lower Arm A (at wrist and above)



Clinical Interpretation

Probable risk for Hemodynamically Significant Stenosis/Recirculation as flow decreases (indicated by color progression from blue to purple)

Expected Access Flow Range
Expected flow range is ideal. However, a sudden drop of 25% in this range may signal a potential onset of stenosis.

Probable risk for Cardiac Failure as flow increases (indicated by color progression from yellow to red)

Action:
Consider Clinical Examination & Imaging

Action:
If Flow Is Steady, Continue Monitoring. If 25% Decrease Occurs, Consider Clinical Exam & Imaging

Action:
Measure Cardiac Output Evaluate AF/CO% Ratio

Transonic



Lower Arm AVF (wrist and above)



Clinical Interpretation

Probable risk for Hemodynamically Significant Stenosis/Recirculation as flow decreases (indicated by color progression from blue to purple)

Expected Access Flow Range
Expected flow range is ideal. However, a sudden drop of 25% in this range may signal a potential onset of stenosis.

Probable risk for Cardiac Failure as flow increases (indicated by color progression from yellow to red)

Action:
Consider Clinical Examination & Imaging

Action:
If Flow Is Steady, Continue Monitoring. If 25% Decrease Occurs, Consider Clinical Exam & Imaging

Action:
Measure Cardiac Output Evaluate AF/CO% Ratio



25% i 4 mdr.

Stenos?!

**+duplex scanning,
+accessografi**





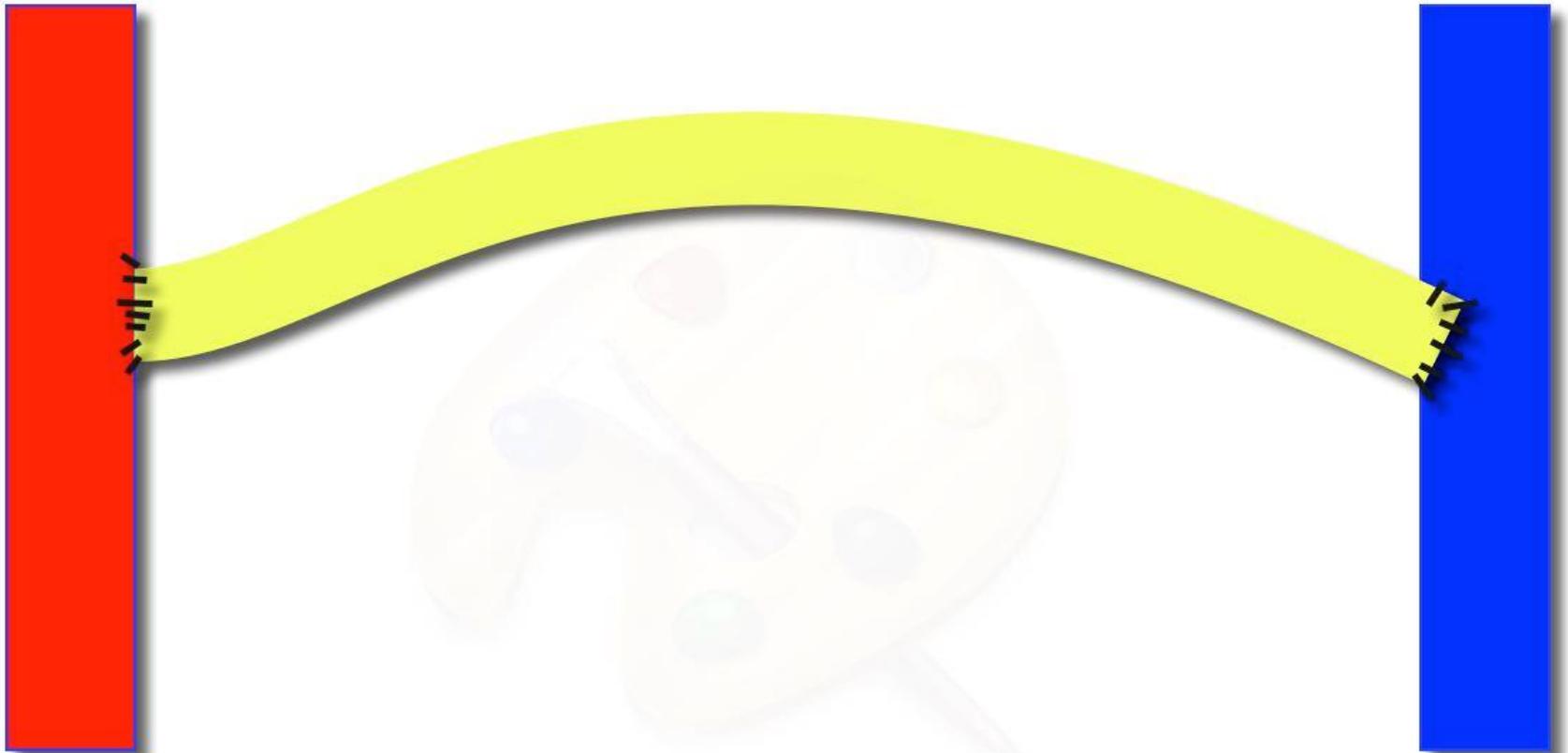
4034

post dila

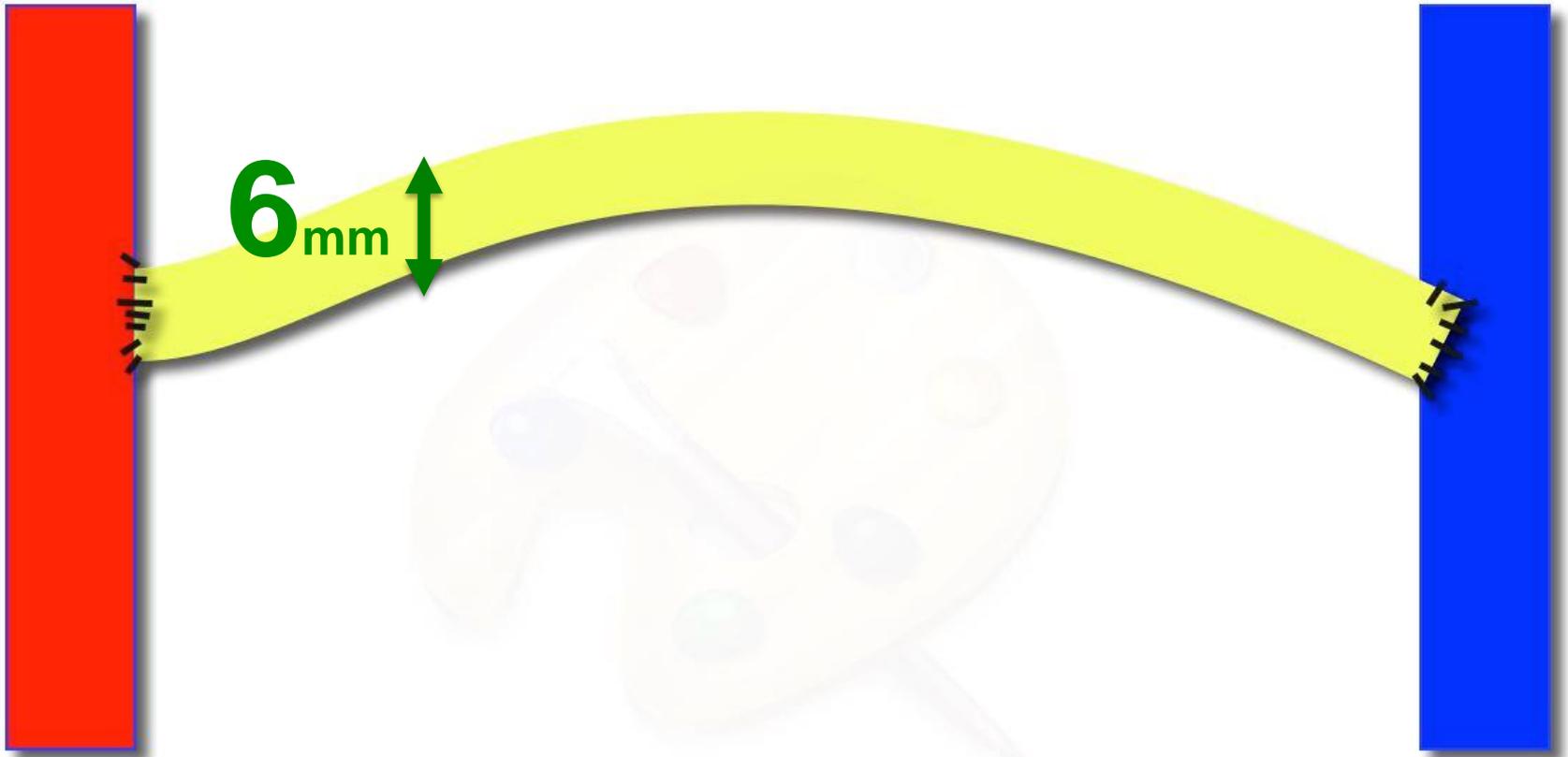
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50 mm (gf)

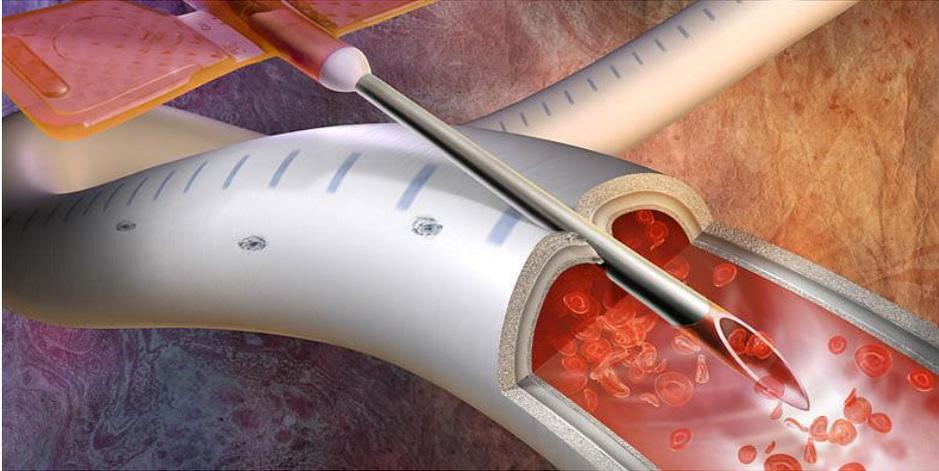
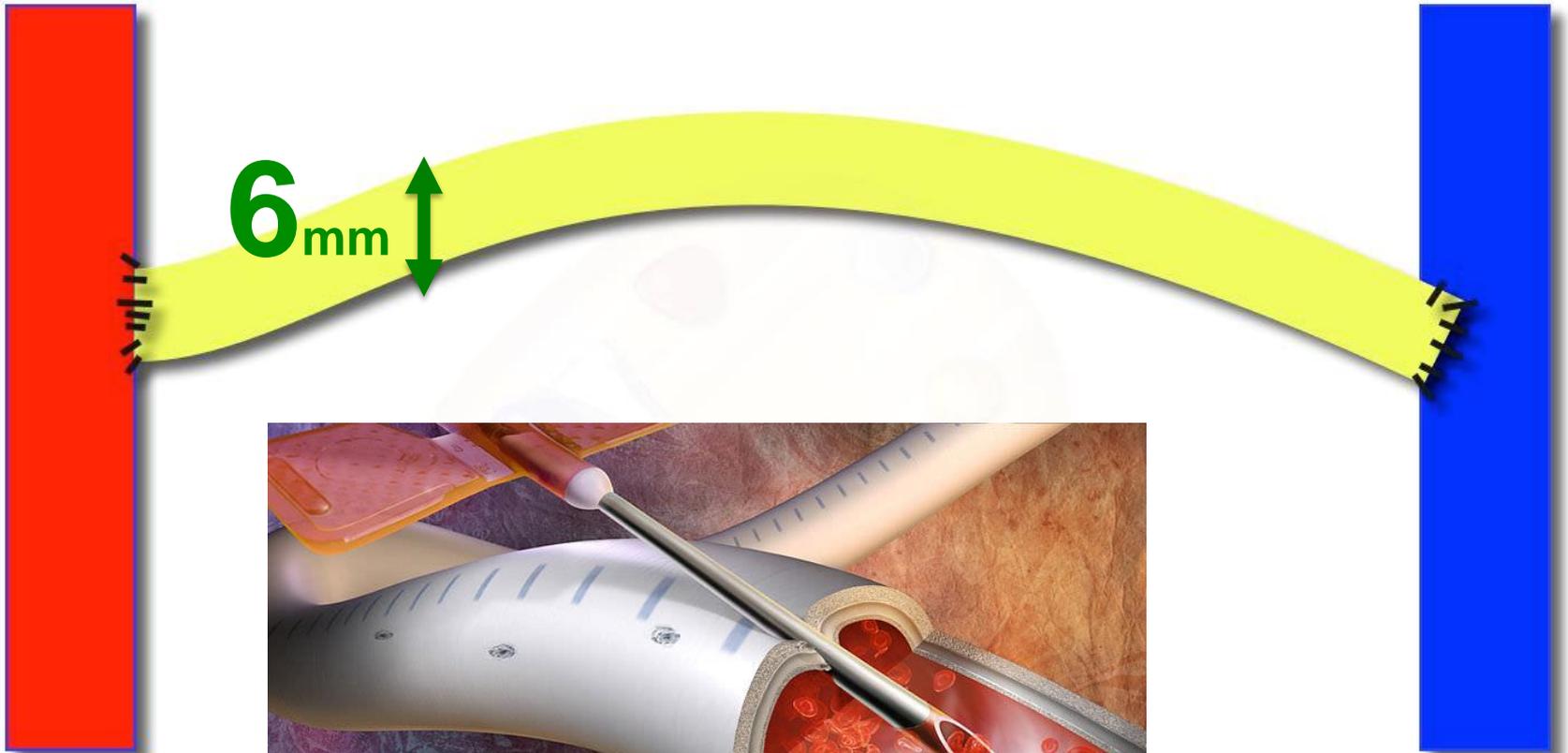
50 mm (gf)

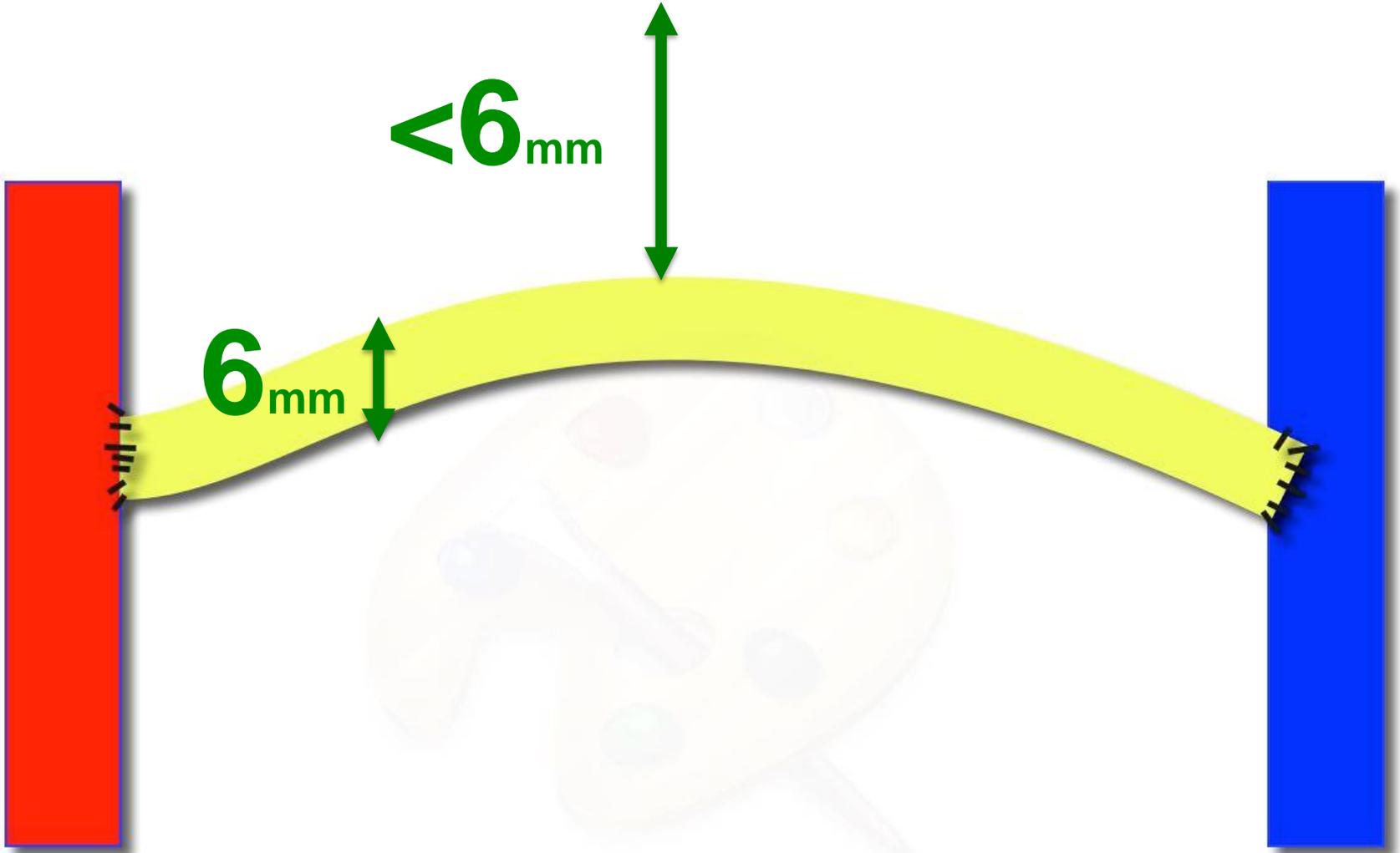


Created by Paint S

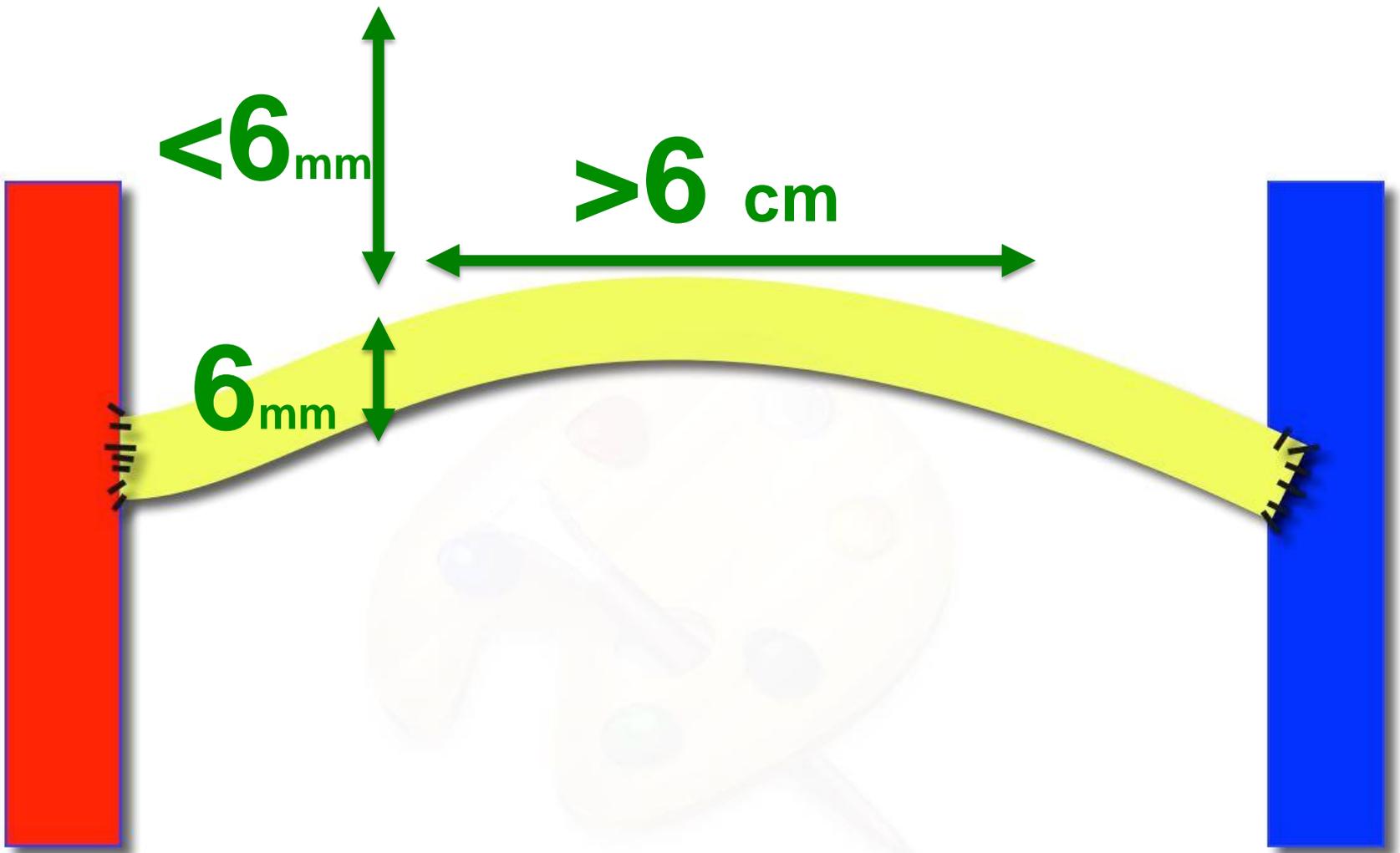


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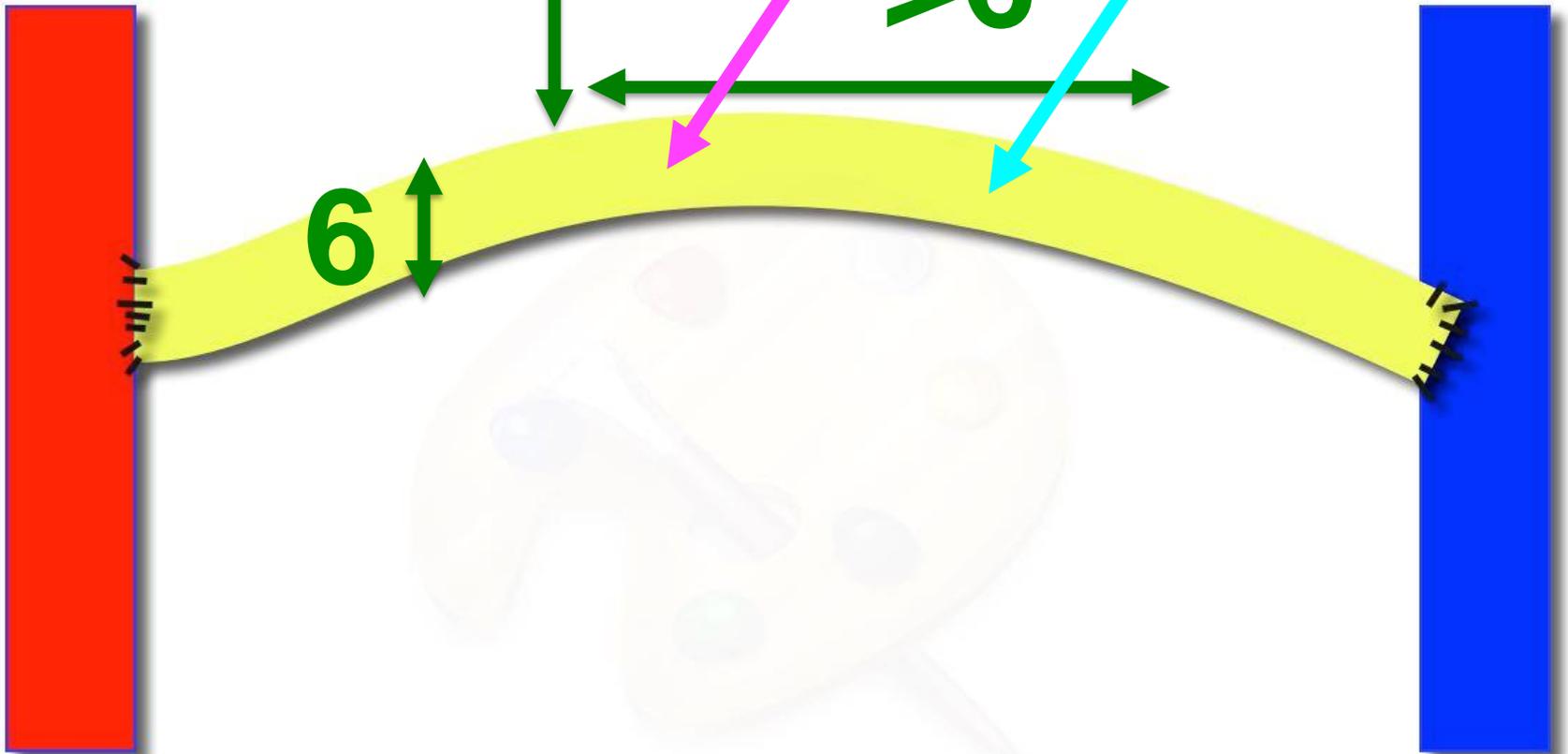




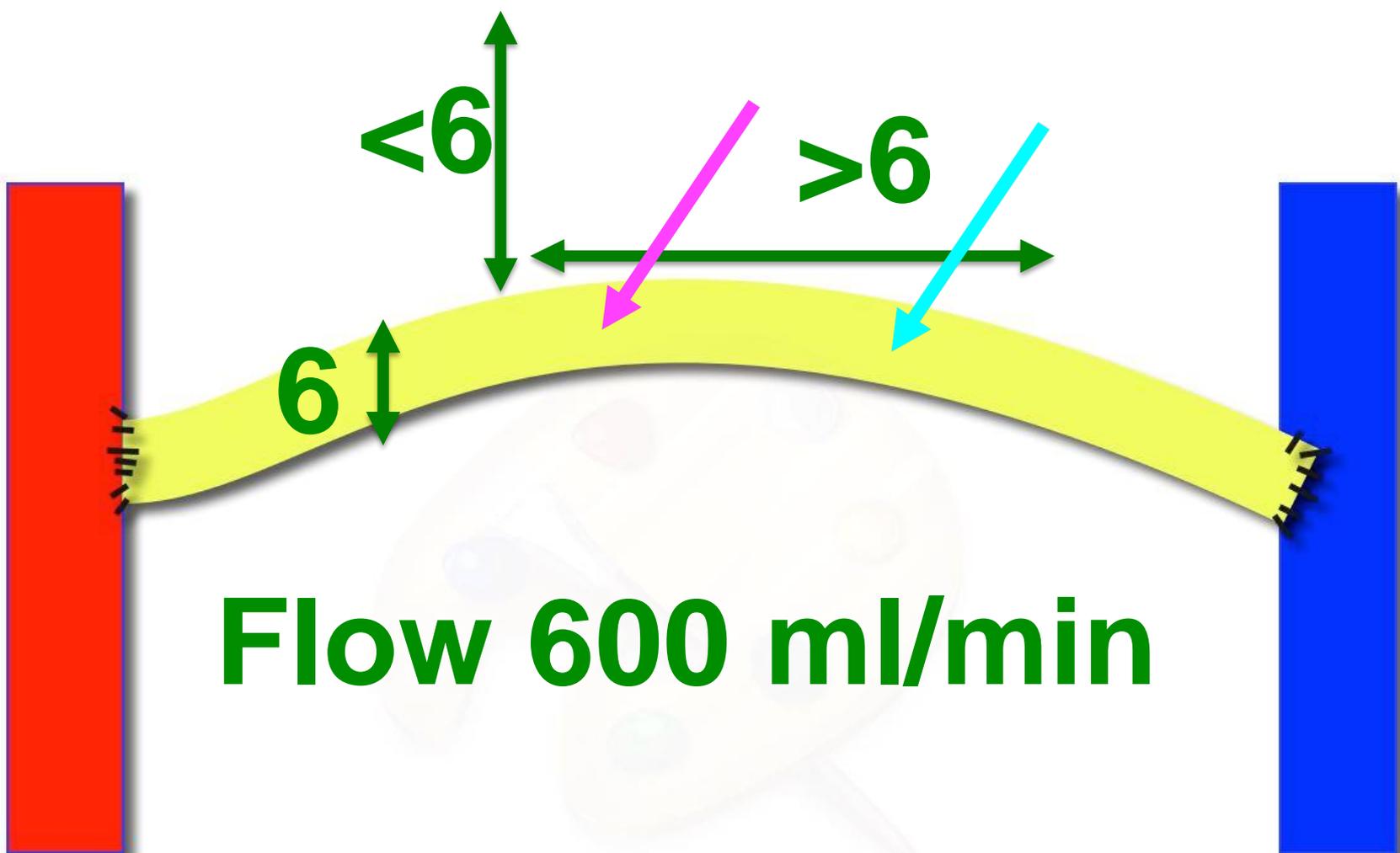
Created by Paint S



Created by Paint S



Created by Paint S



Flow 600 ml/min



Flow 600 ml/min



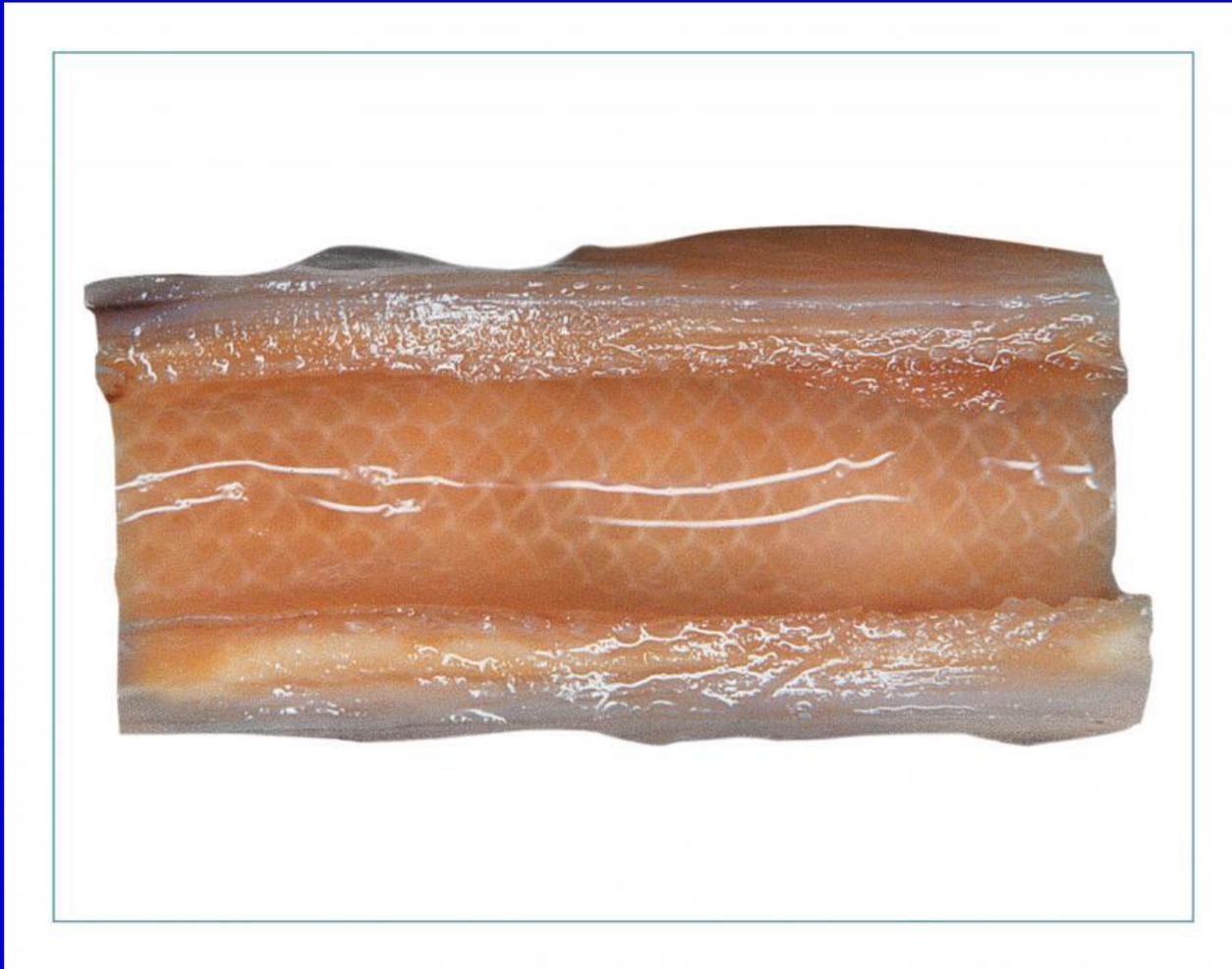


**HAPPY
HALLOWEEN
2021**

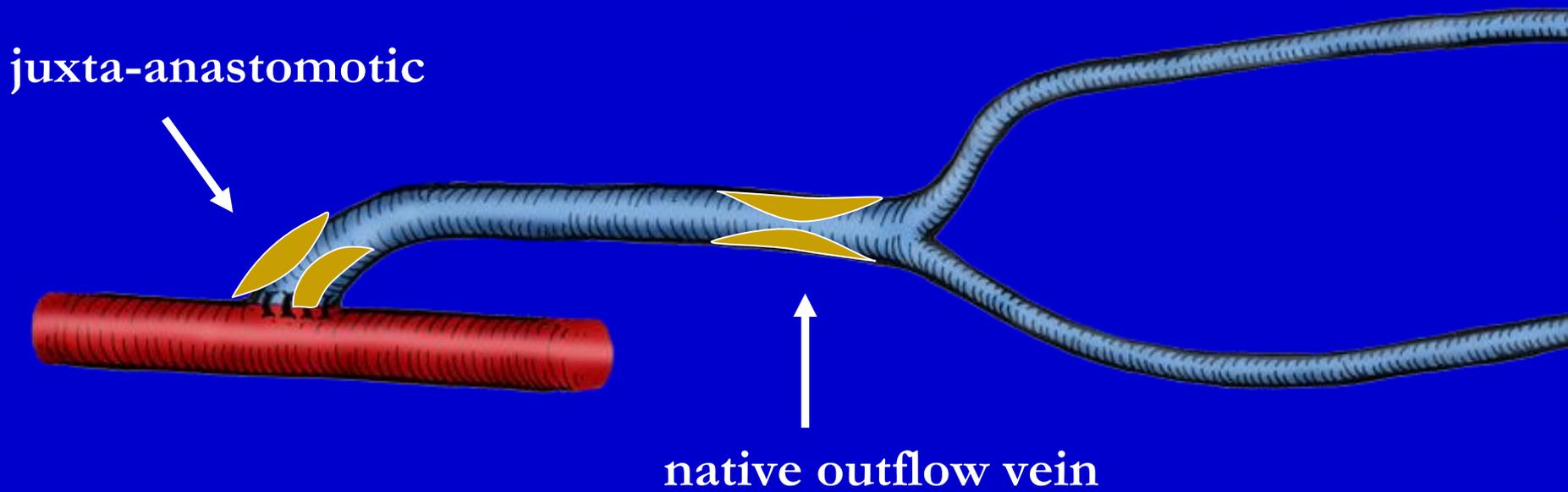


Omniflow® II Biosynthetic Vascular Prosthesis*

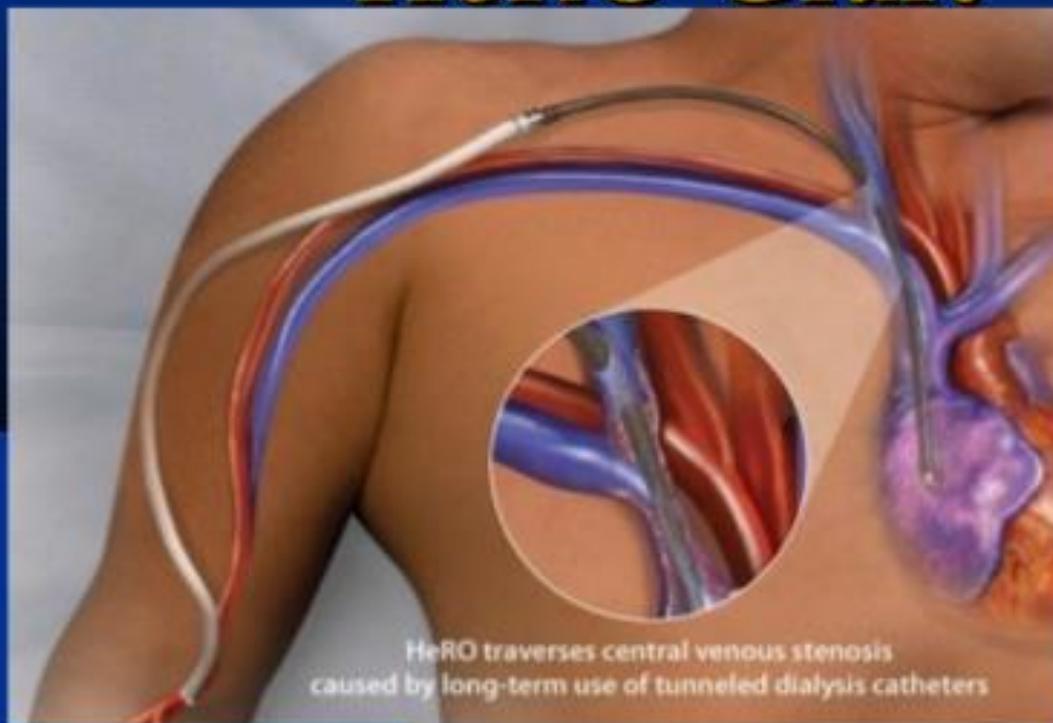
The Omniflow II biosynthetic vascular prosthesis is a composite of cross-linked



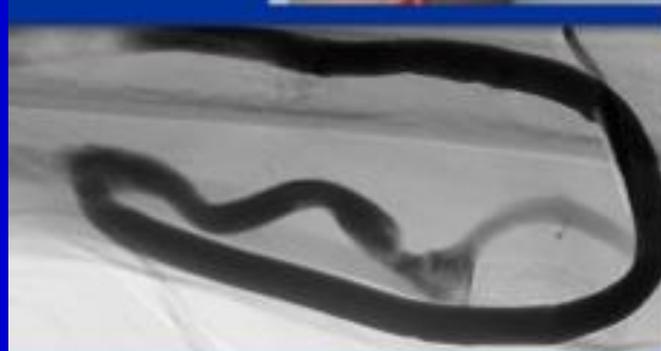
Venous stenosis



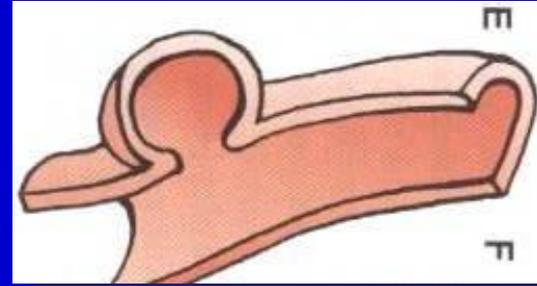
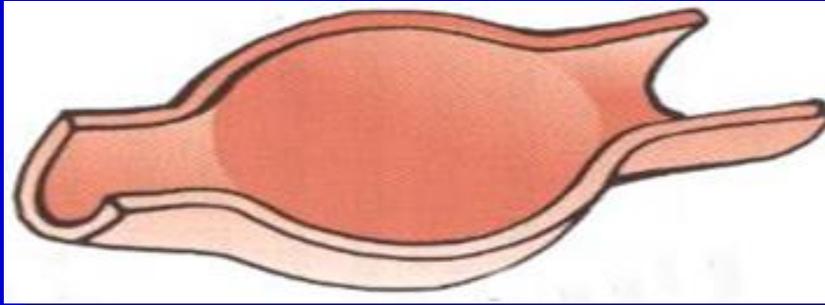
HeRO Graft



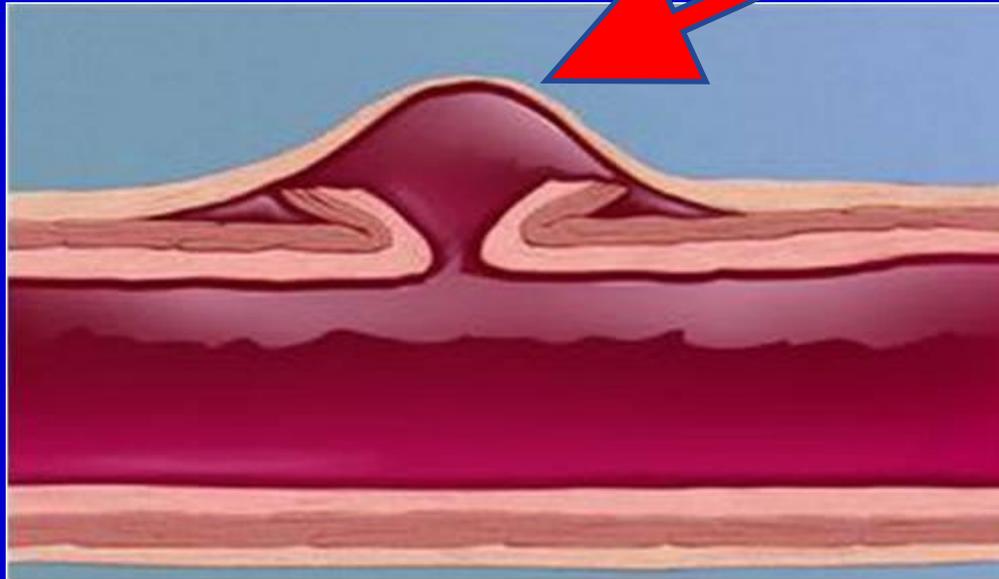
HeRO traverses central venous stenosis
caused by long-term use of tunneled dialysis catheters

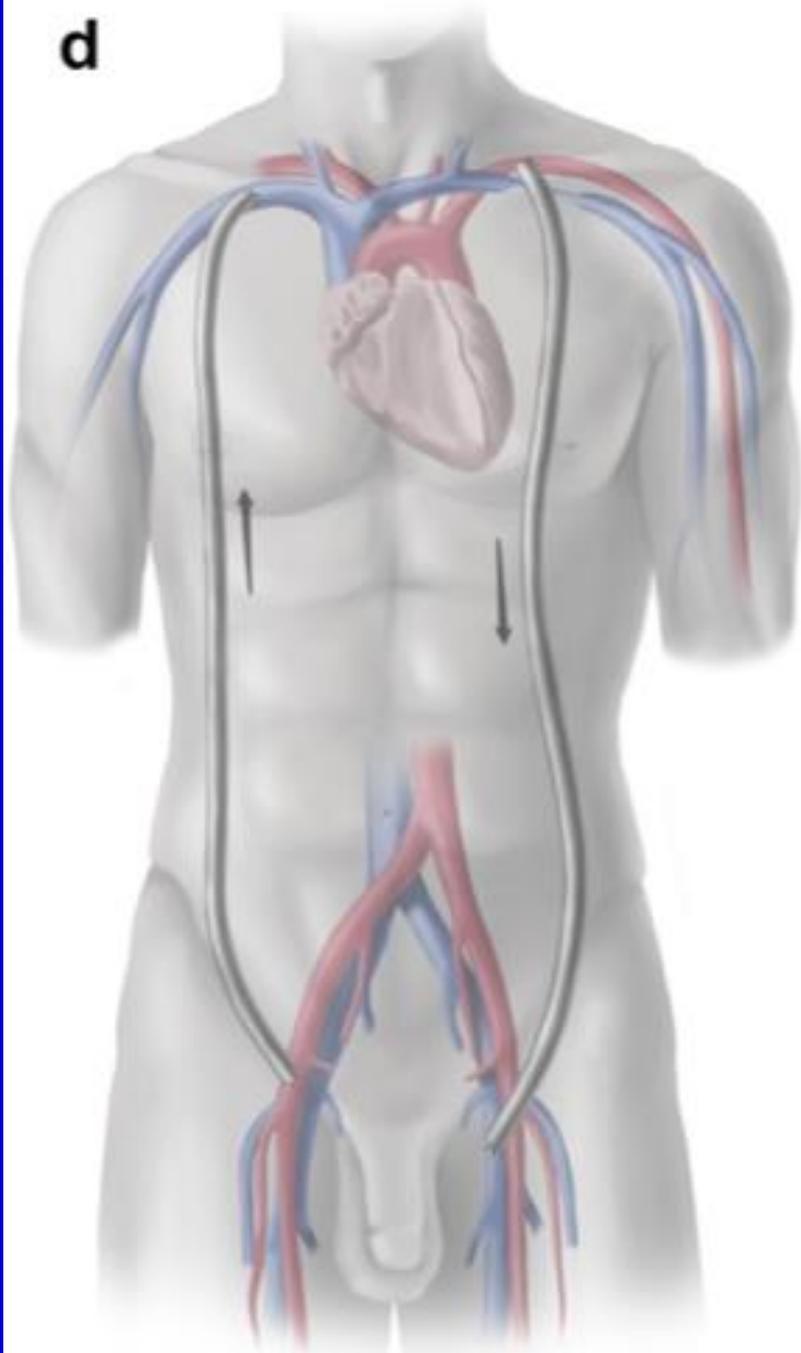
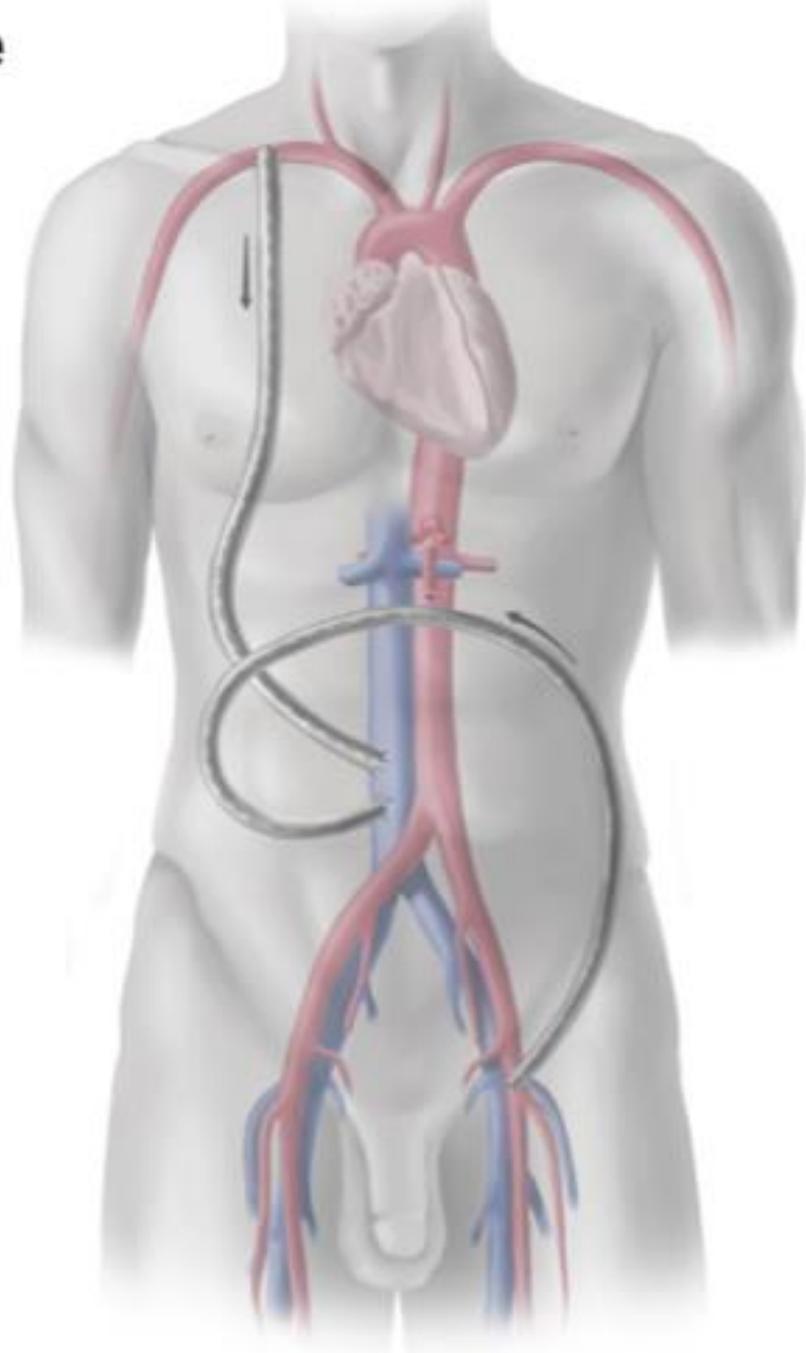


Aneurisme

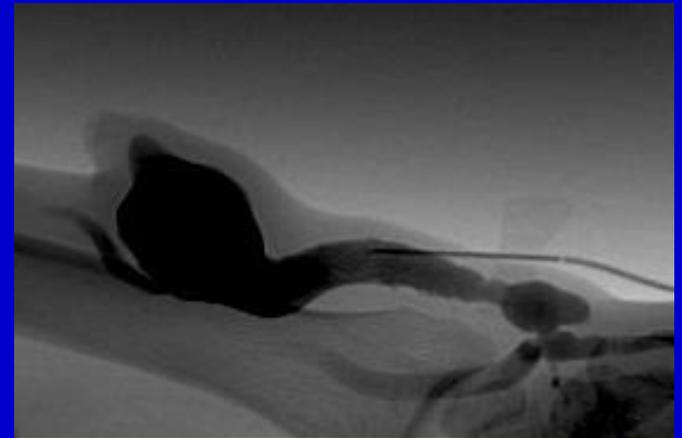
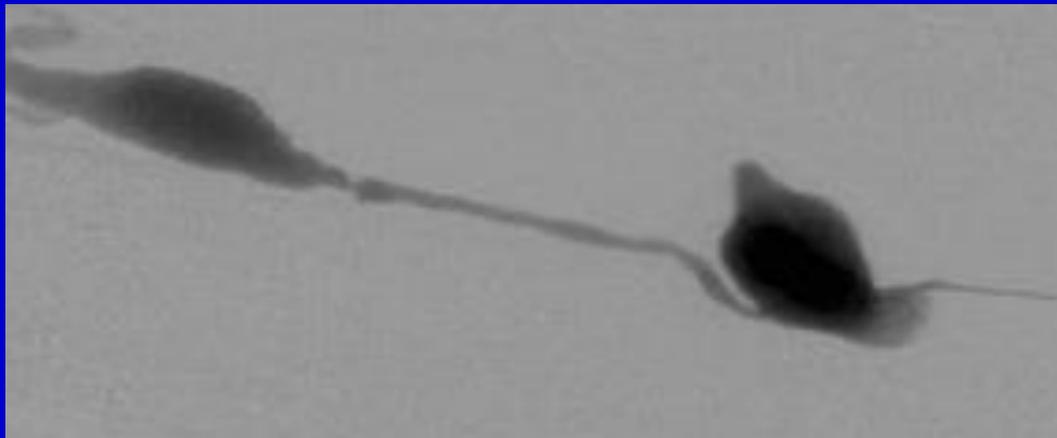
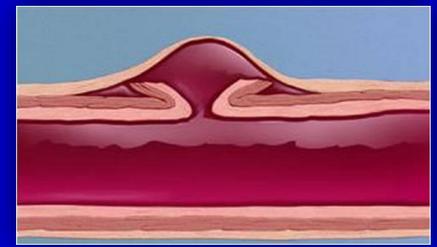


Pseudoaneurisme

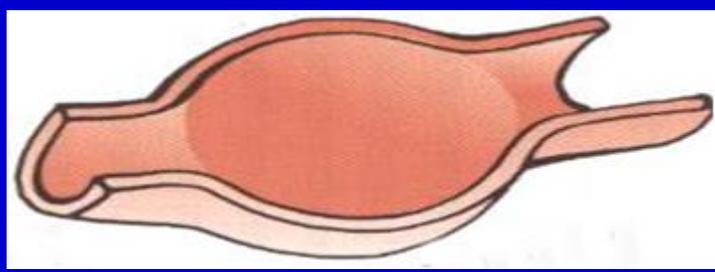
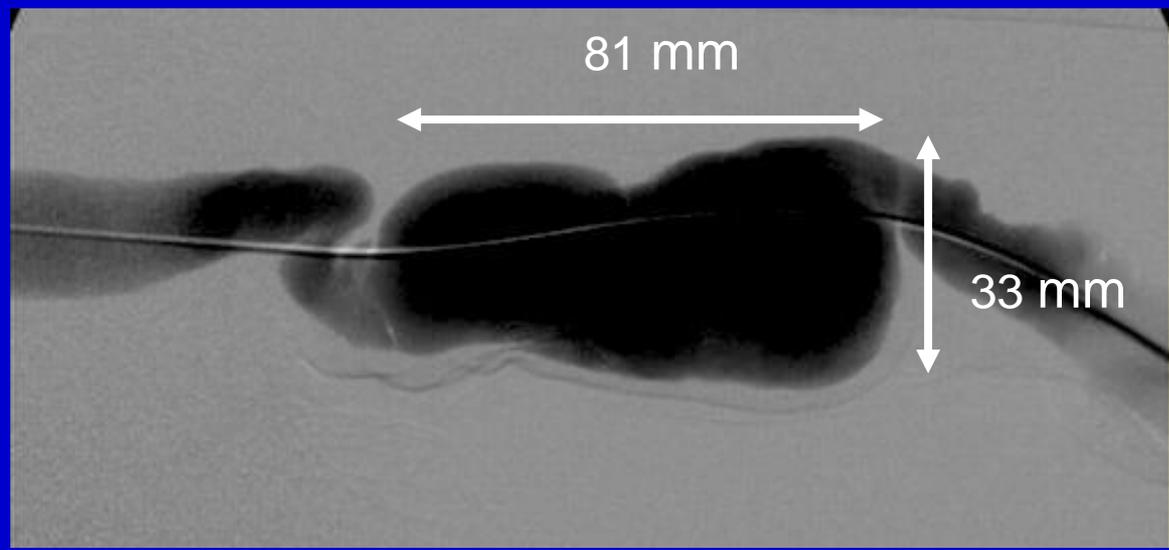


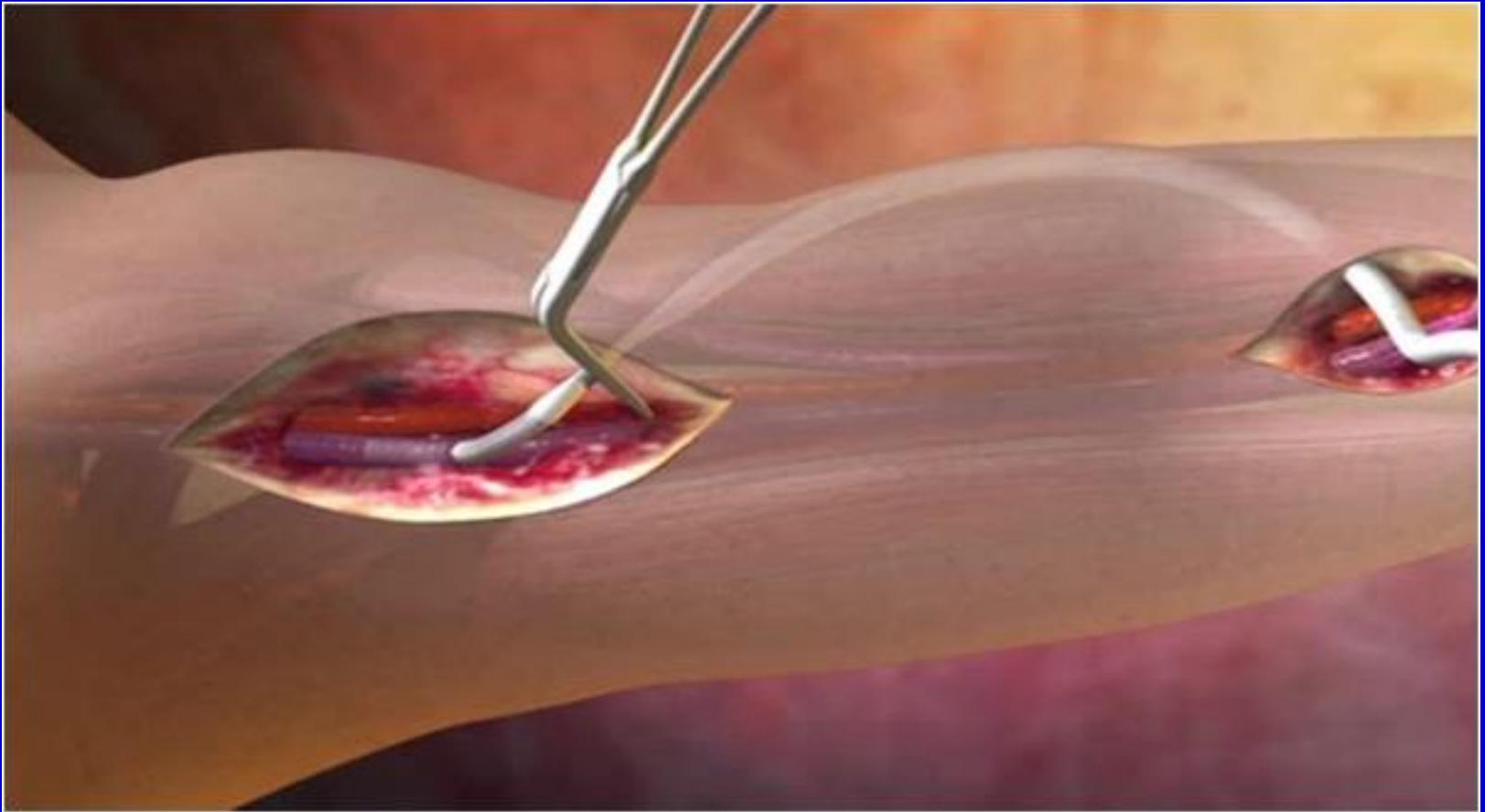
d**e**

Pseudoaneurisme med ulcus fra venstre radial-cephalic fistel



Aneurisme i fistel

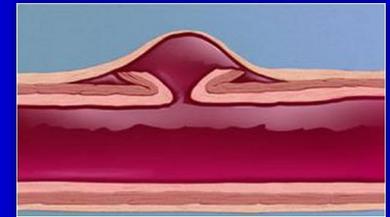




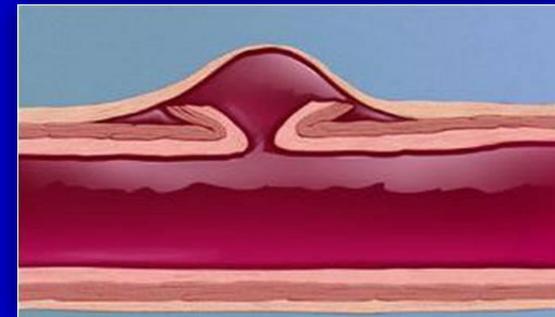
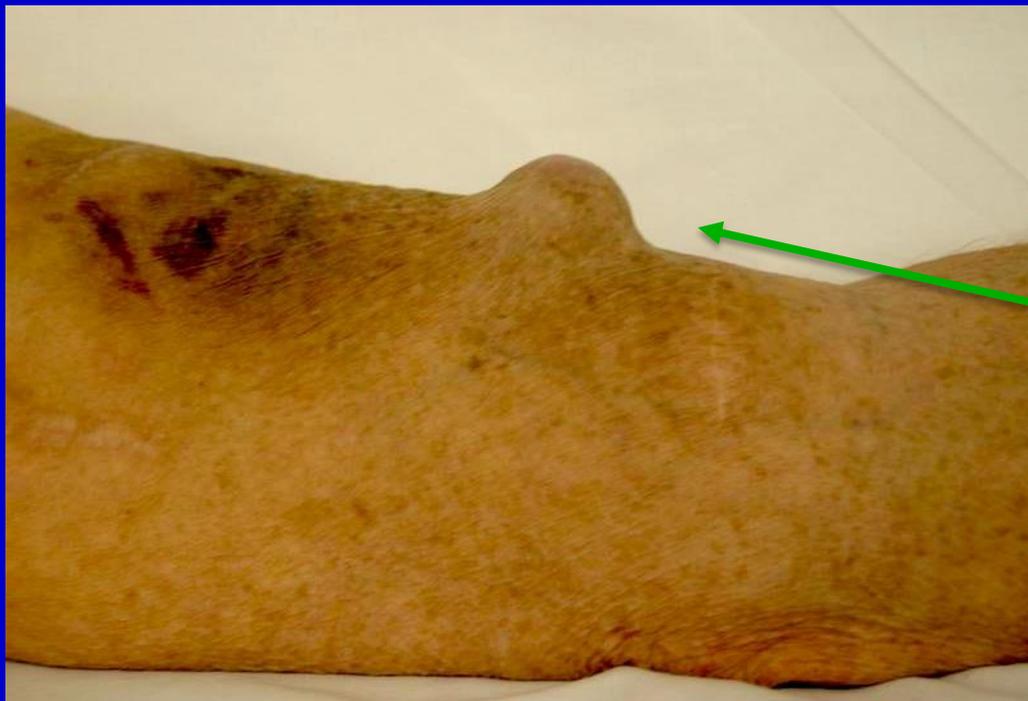
Steal syndrom



Pseudoaneurisme med ulcer



Pseudoaneurysme uden ulcer og stenosis i fistel



pseudoaneurysme

