Acute Fistula Thrombosis:

How I Manage it

Advanced Course in Vascular Access 2019

Convenor: Professor Kittipan Rerkasem

2 – 3 May 2019, Chiang Mai, Thailand

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Conventional Treatment Of Thrombosed AVF

- Urgent operation
- Open surgical embolectomy / thrombectomy
- As an inpatient under GA
- Often with bridging dialysis (vascath)

Open Surgery

It can deal with a Large Clot Burden,

BUT

- Low success rate
- No definition of inflow / outflow
- No clear identification of index stenosis
- Problems with wound healing / sepsis
- Makes post op dialysis difficult / impossible

Endovascular Treatment Of The Thrombosed AVF

- As an outpatient
- On the next available list (NOT an emergency)
- Under Local Anasthetic or Arm Block
- Without bridging dialysis
- Patients eat & drink, take all their medication
- Patients dialyse immediately post op

Managing the Occluded AVF

- What facilities are available to you ?
- How “important” is the fistula ?
- How old is the Thrombosis ?

Tools

- ULTRASOUND !
- Open surgery / Thrombo-embolectomy
  "Incision Embolectomy"
- Thrombolysis
- Endovascular Technics: "Squishoplasty"/ Stents

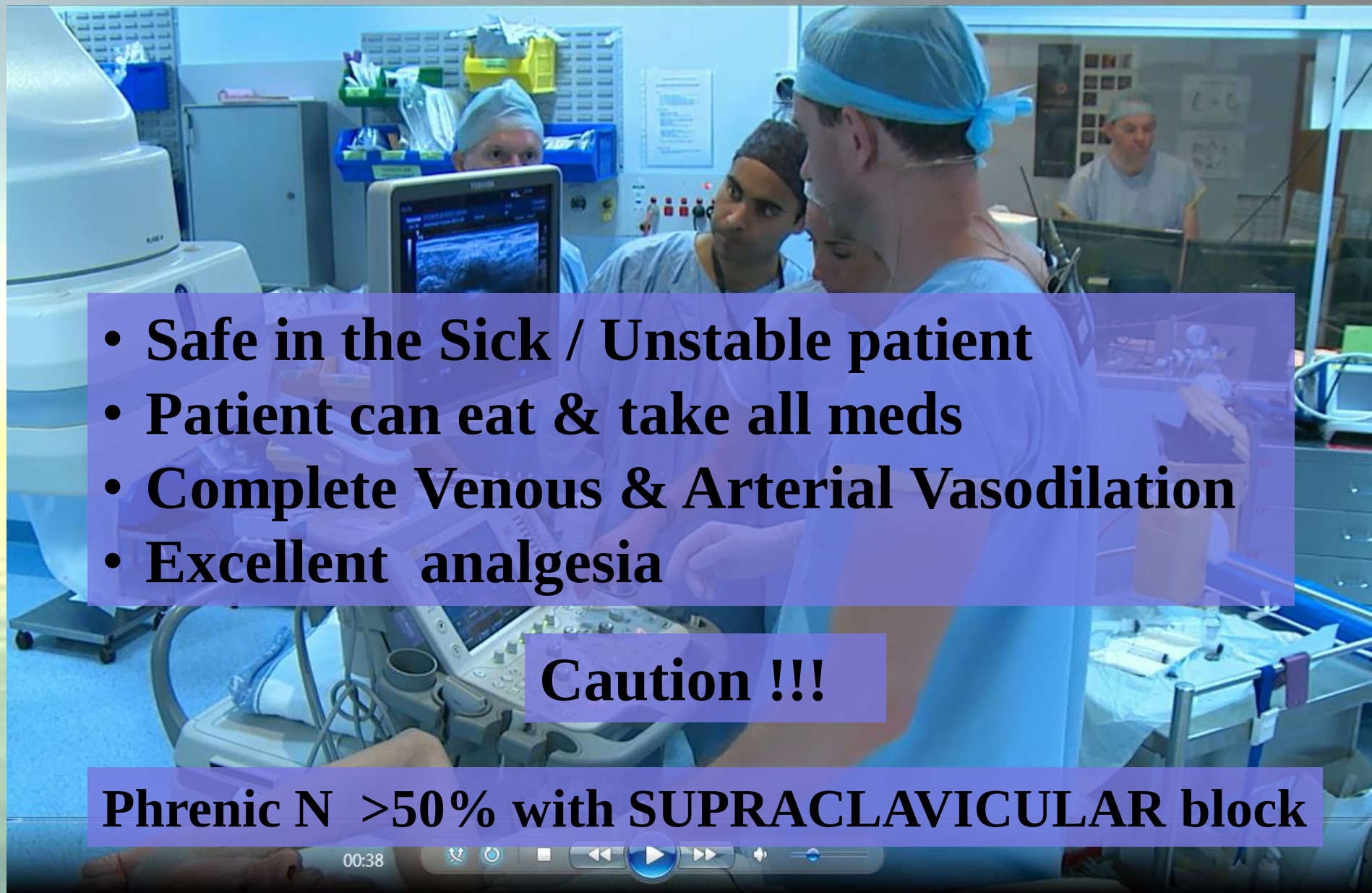
PATIENT LOGISTICS

- Vascular team notified
- Patient on next available list
- Renal manages fluid balance and K+
- Procedure done as a day-case, LA procedure
- Patient dialyses immediately after

In Some Patients (Complex)

- Vascath for very high K+ / pulmonary edema.
- Occasional General Anasthesia
- Overnight hospital stay, arm elevation
- Dialysis delayed until next day in some

Ultrasound Guided Arm Block



- **Safe in the Sick / Unstable patient**
- **Patient can eat & take all meds**
- **Complete Venous & Arterial Vasodilation**
- **Excellent analgesia**

Caution !!!

Phrenic N >50% with SUPRACLAVICULAR block

Pre-Operative U/S Essential !

- Confirm occlusion
- Establish extent of Thrombosis
- Establish site of Index Stenosis (if possible)
- ! Plan Access / Accesses !

Aims in Treating the Occluded AVF

1. Restore flow
2. Make fistula “Dialysable”
3. Prevent Recurrence

In that order!

Issues

- Extent of thrombosis
- Endovascular Access for intervention
- Dealing with the Thrombus
- Dealing with the Stenosis

DEALING WITH THE THROMBUS

- EMBOLISATION TO LUNG √ +++
  - FRESH CLOT
  - LIMITED AMOUNTS
- INCISION EMBOLECTOMY √ +++
- "CAGING" OF CLOT WITH BARE NITINOL STENT √ +++
  FOLLOWED BY BALLOON ANGIOPLASTY
- SUCTION THROMBECTOMY √ +
- ANTICOAGULATION (HEPARIN+PLATELET BLOCK) √ +++
- THROMBOLYSIS X
- MECHANICAL THROMBECTOMY DEVICES X

EMBOLISATION TO LUNG

" SAFE "

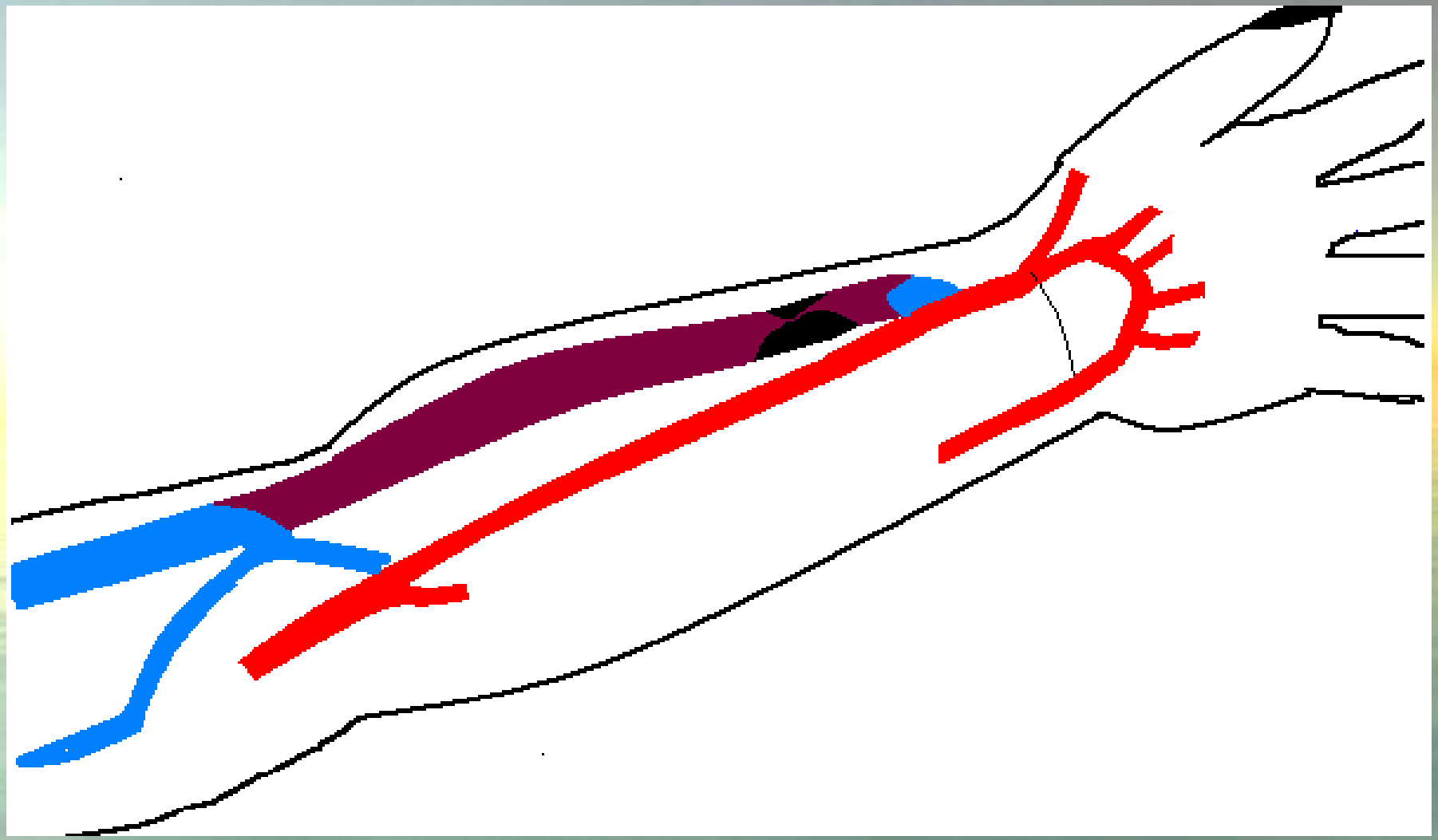
- Longstanding practice
- Clot mechanically lysed – "squishoplasty" + flow!
- Minimal clot burden cf lung's lytic capacity
- No problems encountered by author
- Issue of paradoxical embolism

Extensive Thrombosis: Step 1: “Incision Embolectomy”

- To minimizes clot burden
- To decrease operating time
- To minimise use of alternative clot treatment

- 2 cm transverse incision thru healthy skin
- Thrombus squeezed / milked out
- Wound closed tightly continuous 3’0 prolene

“INCISION EMBOLECTOMY”



“INCISION EMBOLECTOMY”

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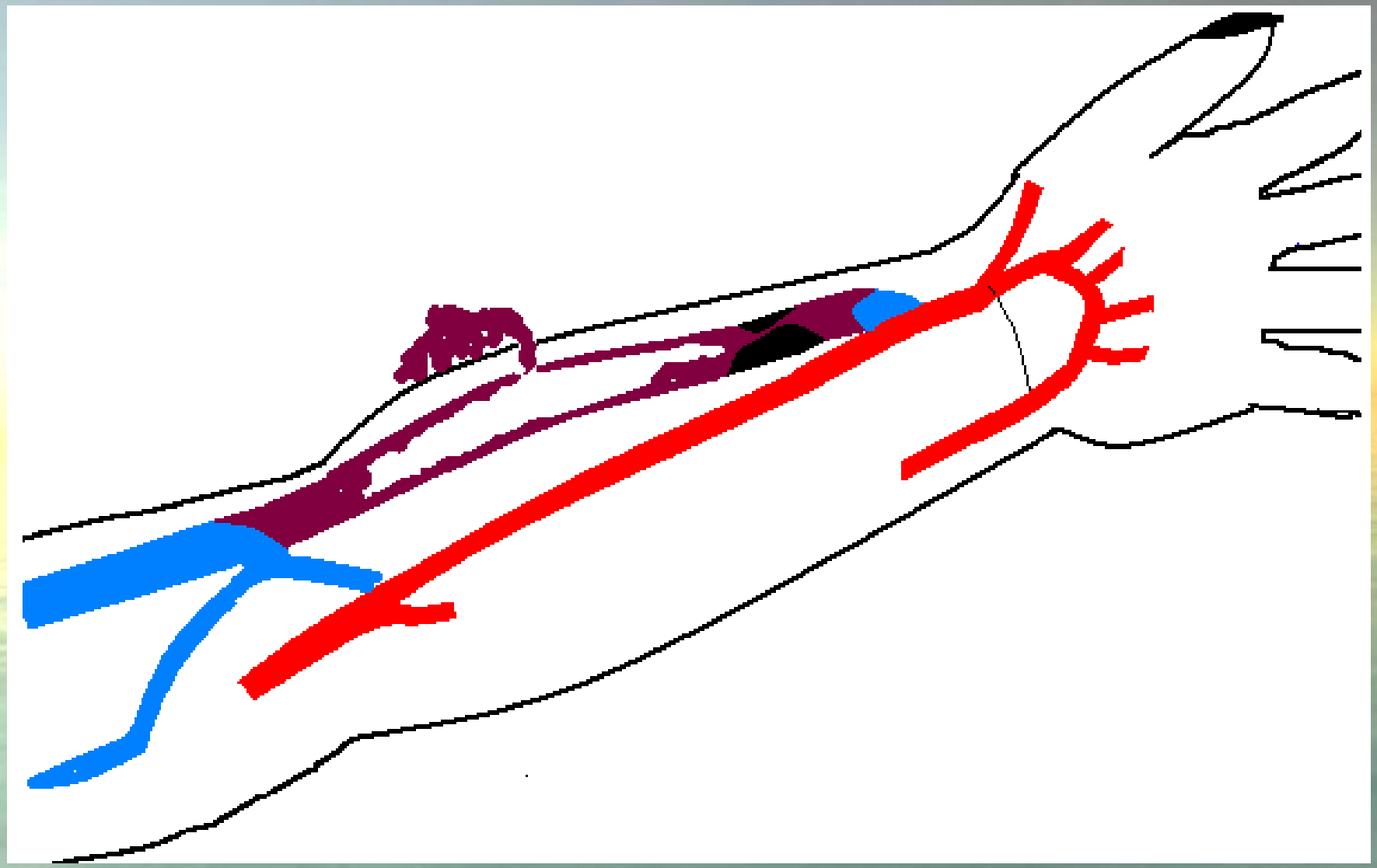

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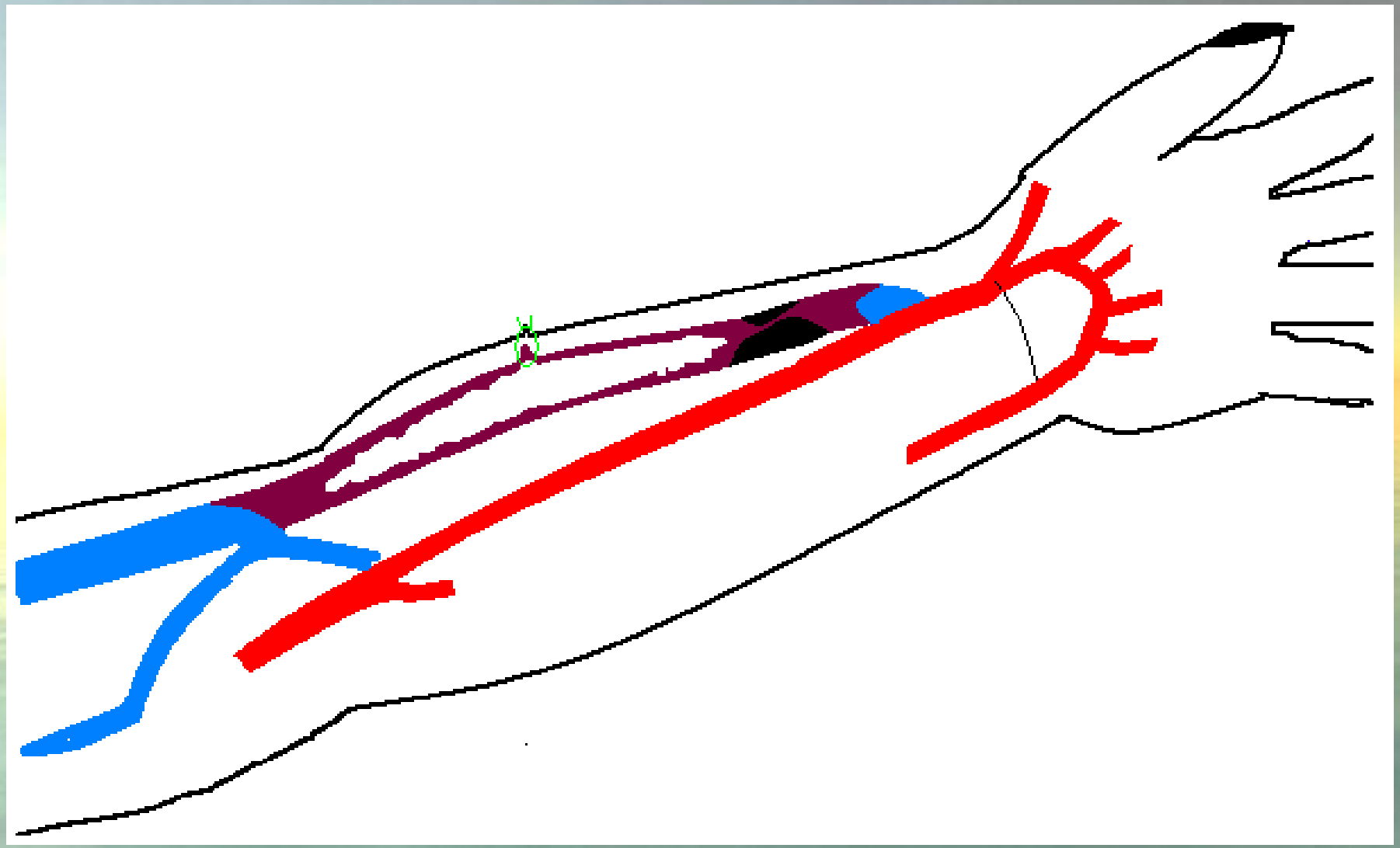

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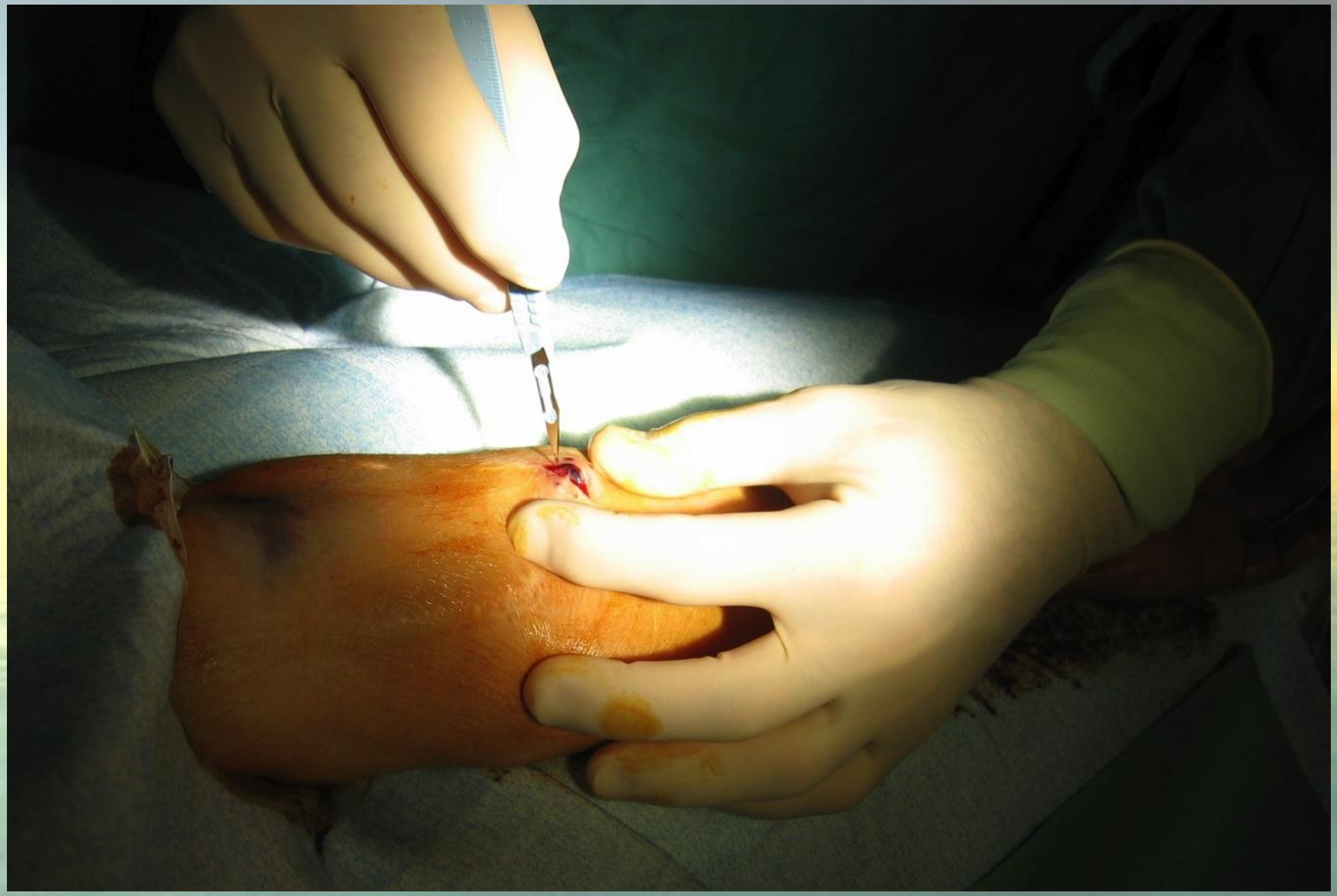

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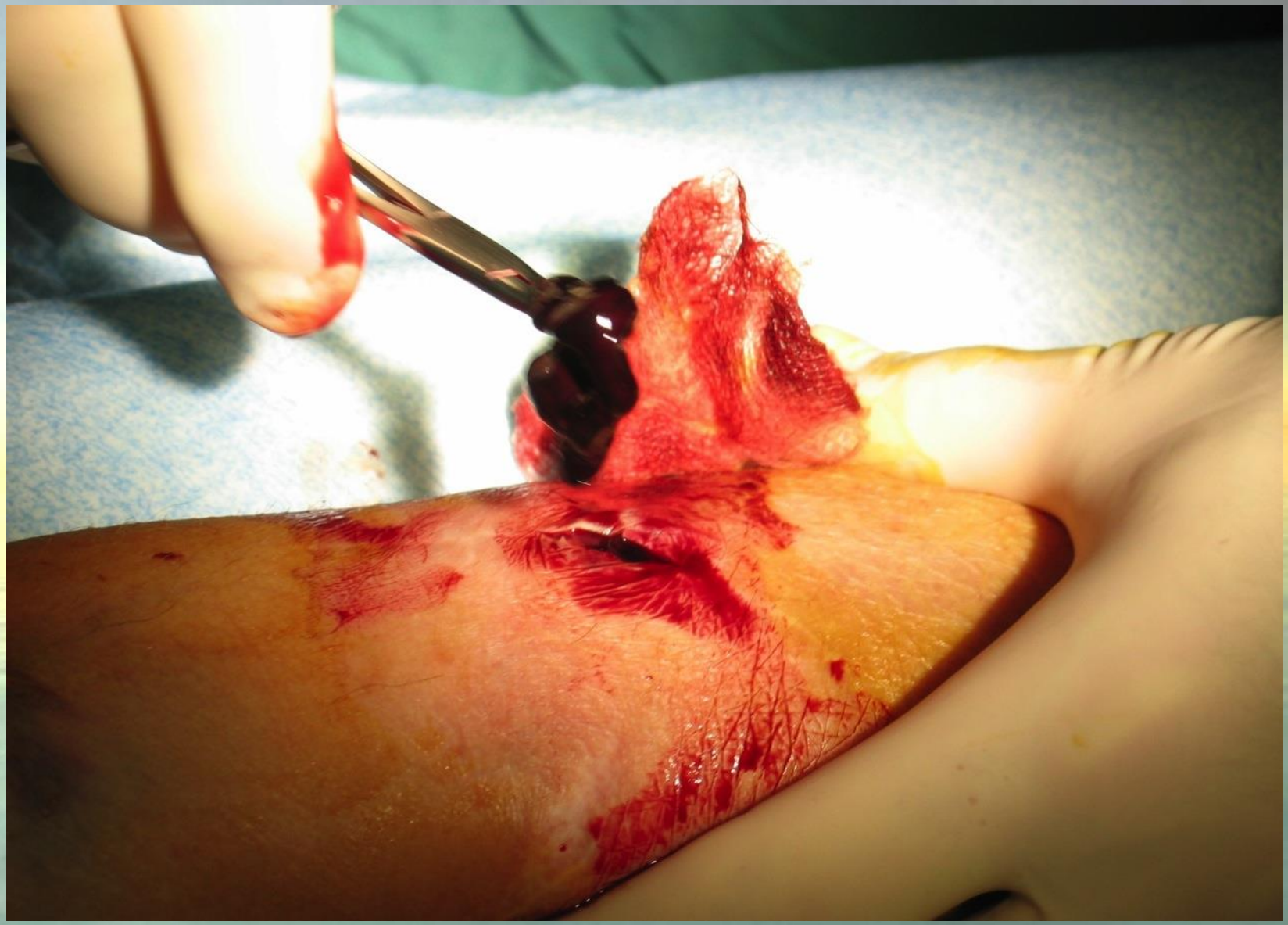

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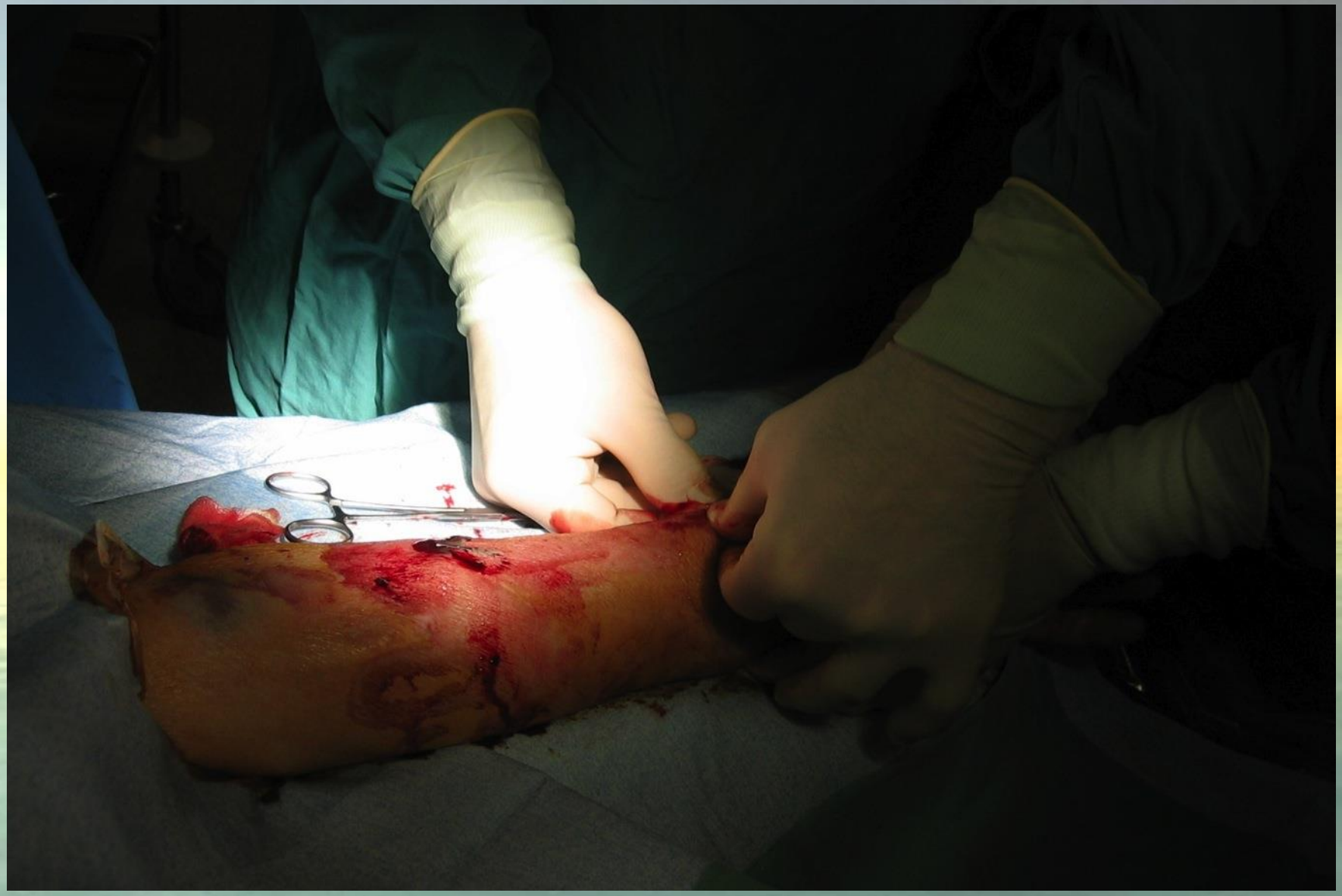

“INCISION EMBOLECTOMY”

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“INCISION EMBOLECTOMY”

Recent Modification of Technique

- Less use of "Incision Embolectomy" –
  Wound problems

- Use of large (Central Venous) Stents
  Line Useable Segment with Nitinol
  Squishoplasty, cage, fragment, embolise clot

NB

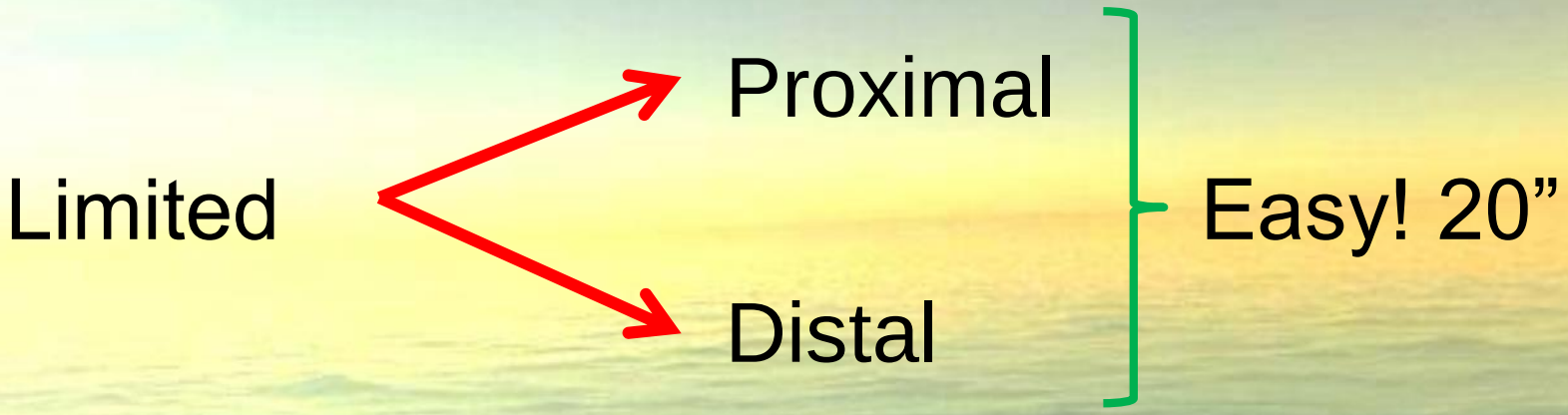
All stents used are

BARE metal (**UN-**Covered)
Nitinol Stents

NO covered stents used!!

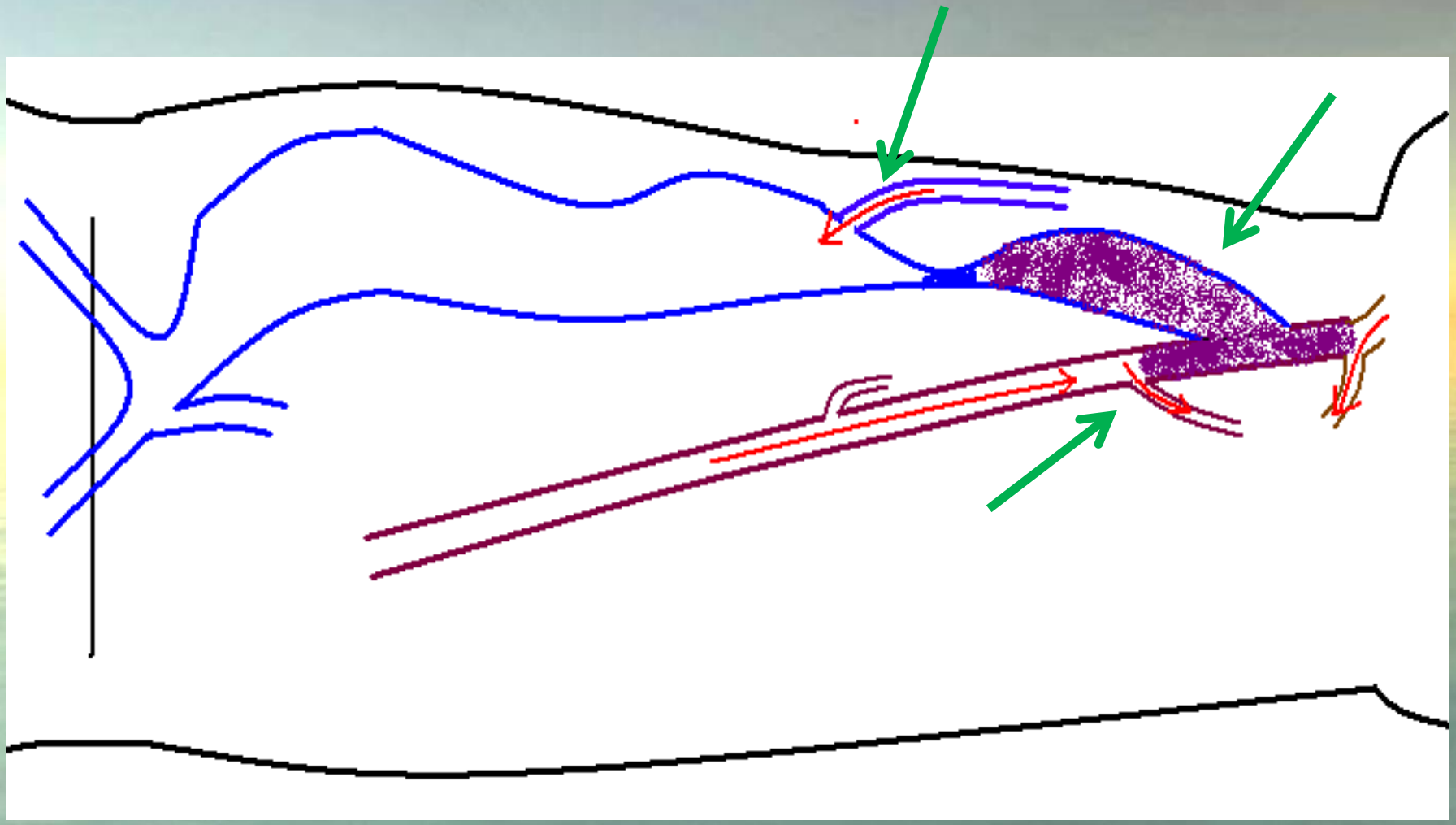
TECHNIQUE

- Depends on extent / severity of occlusion



Extensive – Difficult ! 2 hours

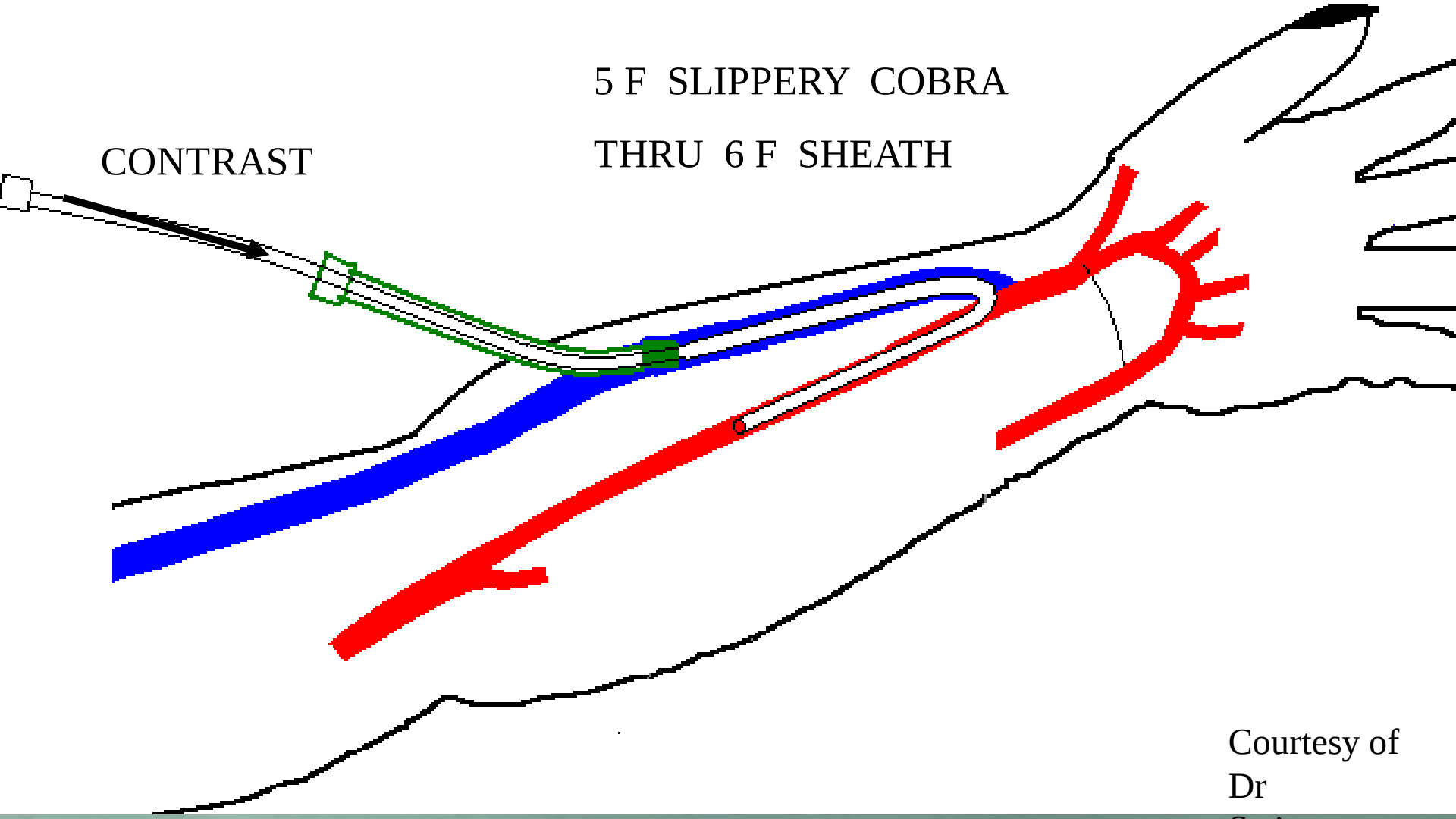
Limited Thrombosis
DISTAL



Limited Thrombosis
DISTAL

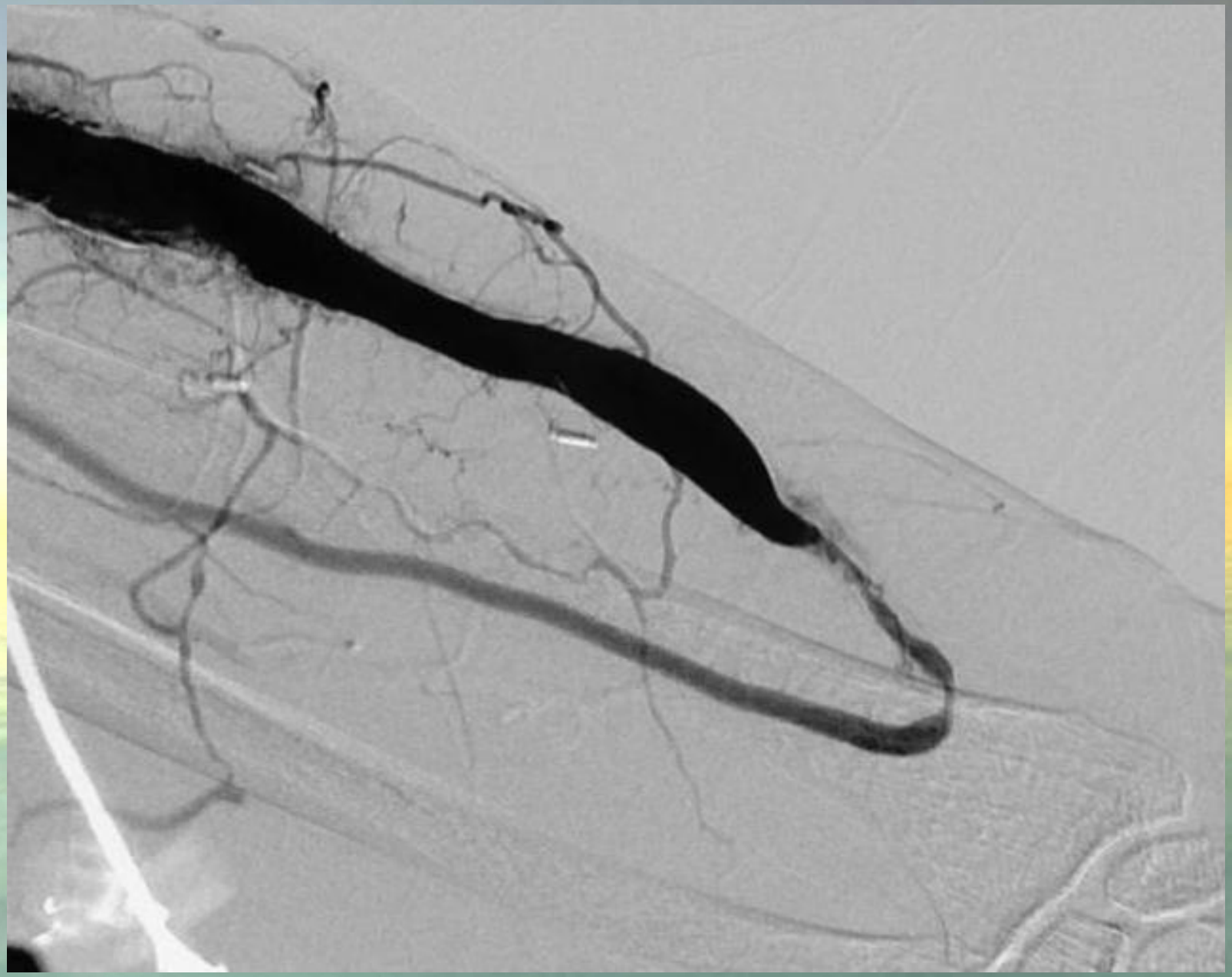
- Easy, quick. Almost like an elective stenosis
- Clot burden small, Index lesion known
- Retrograde approach
- Swing vein or Juxta-Anastomotic Stent

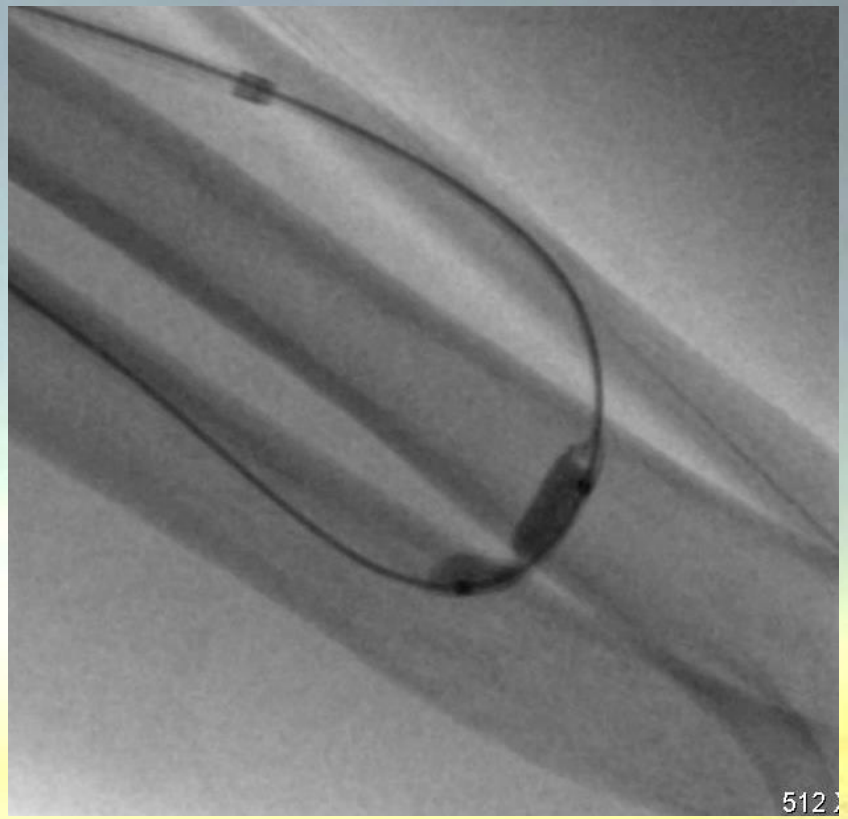
1.ACCESS
Retrograde CV stab with Antegrade imaging



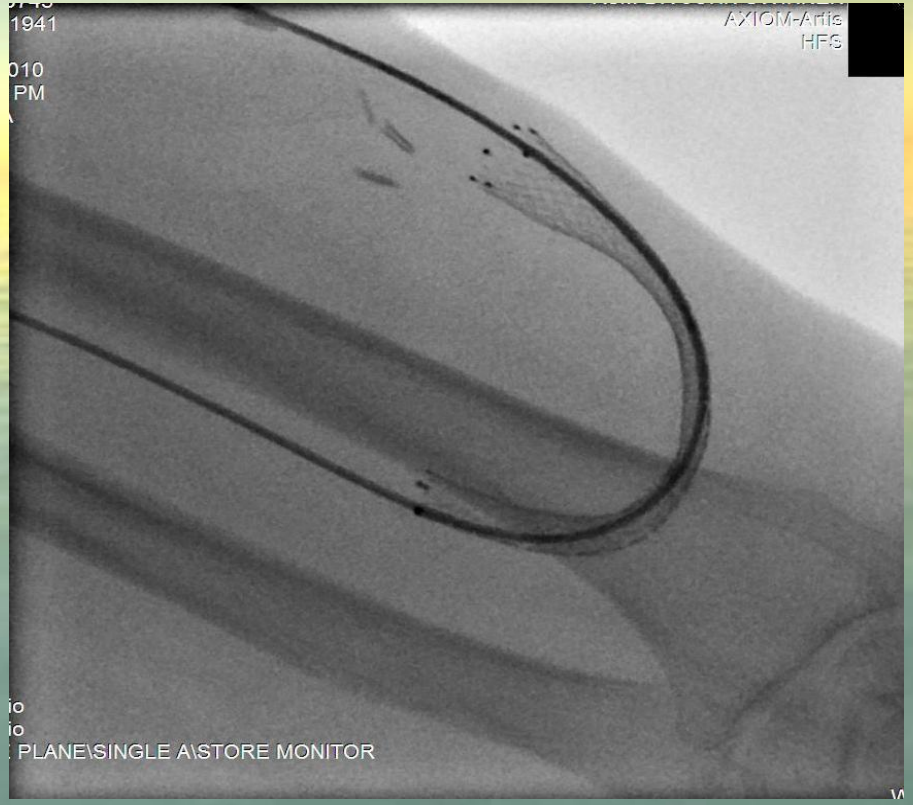
Courtesy of Dr Swinnen

JUXTA-ANASTOMOTIC STENTS

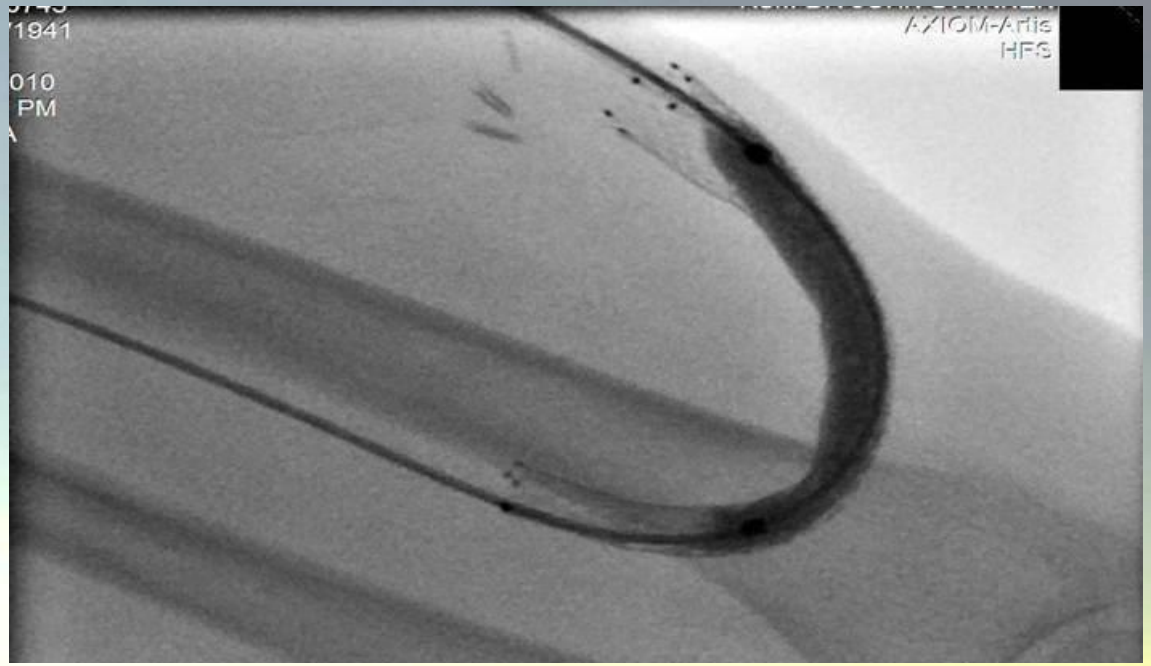




2. Initial Angioplasty

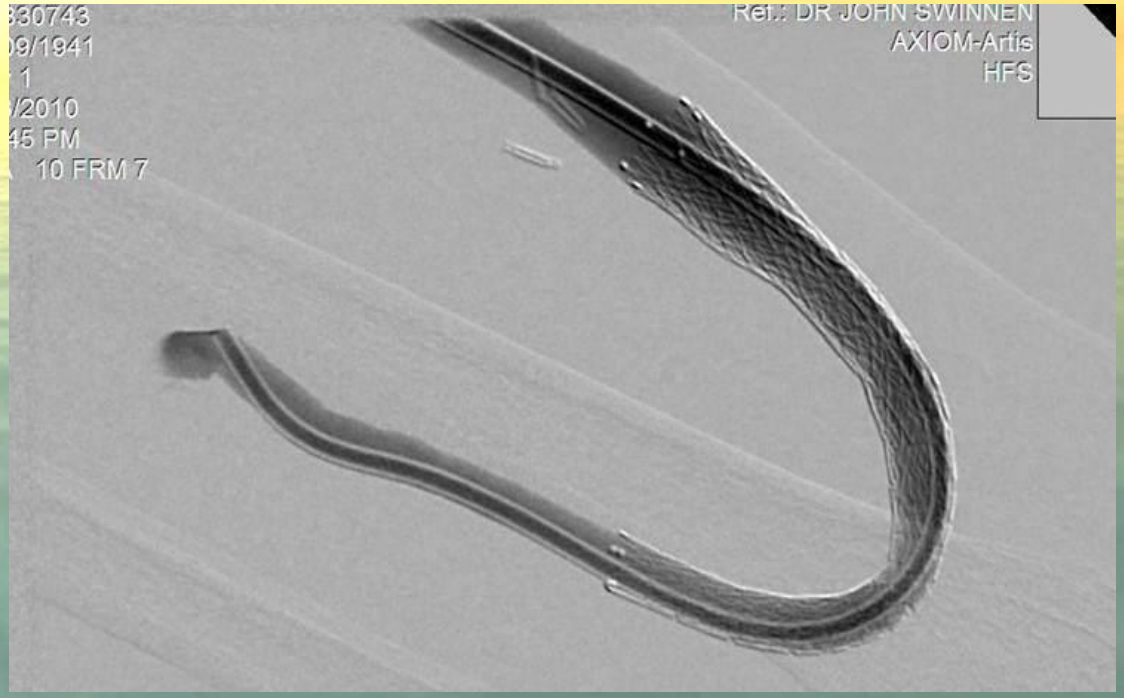


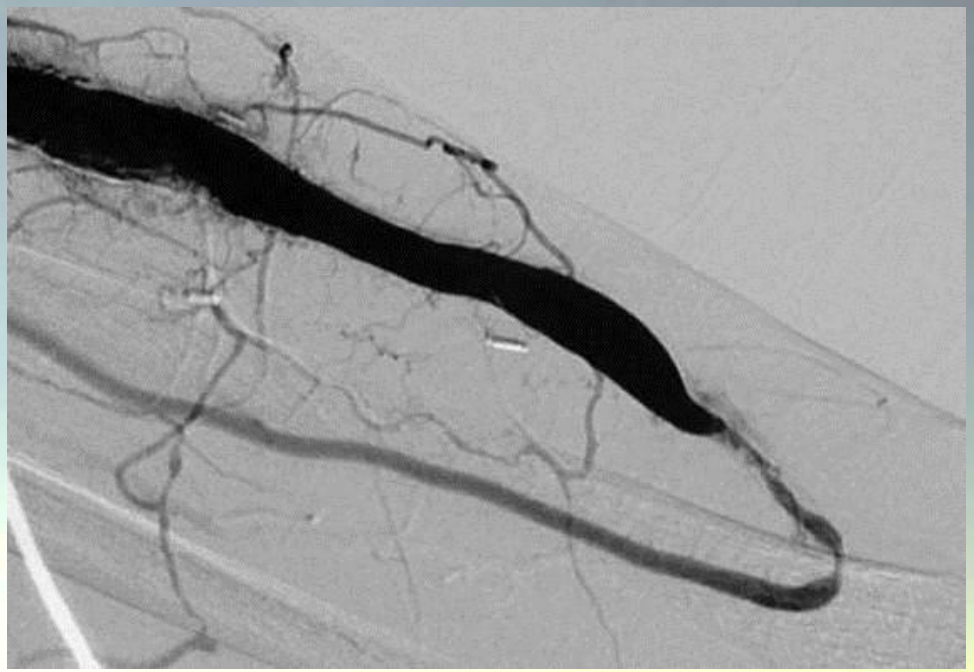
3. Primary Stenting



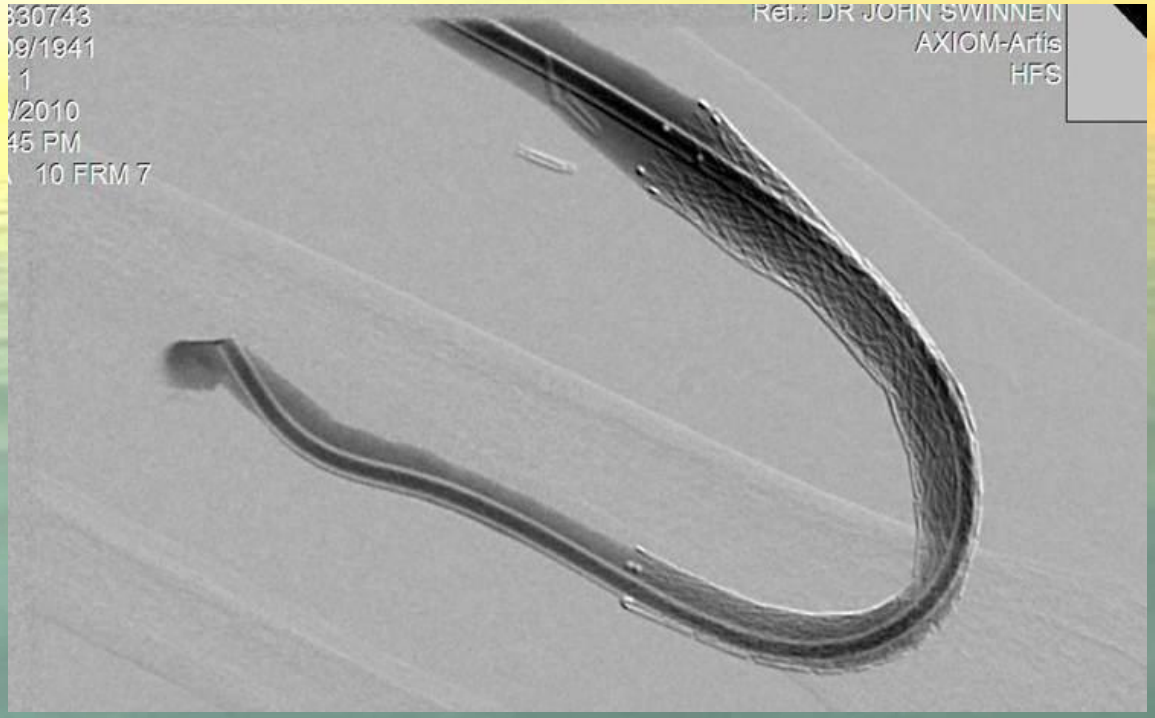
4. Secondary Angioplasty

Completion



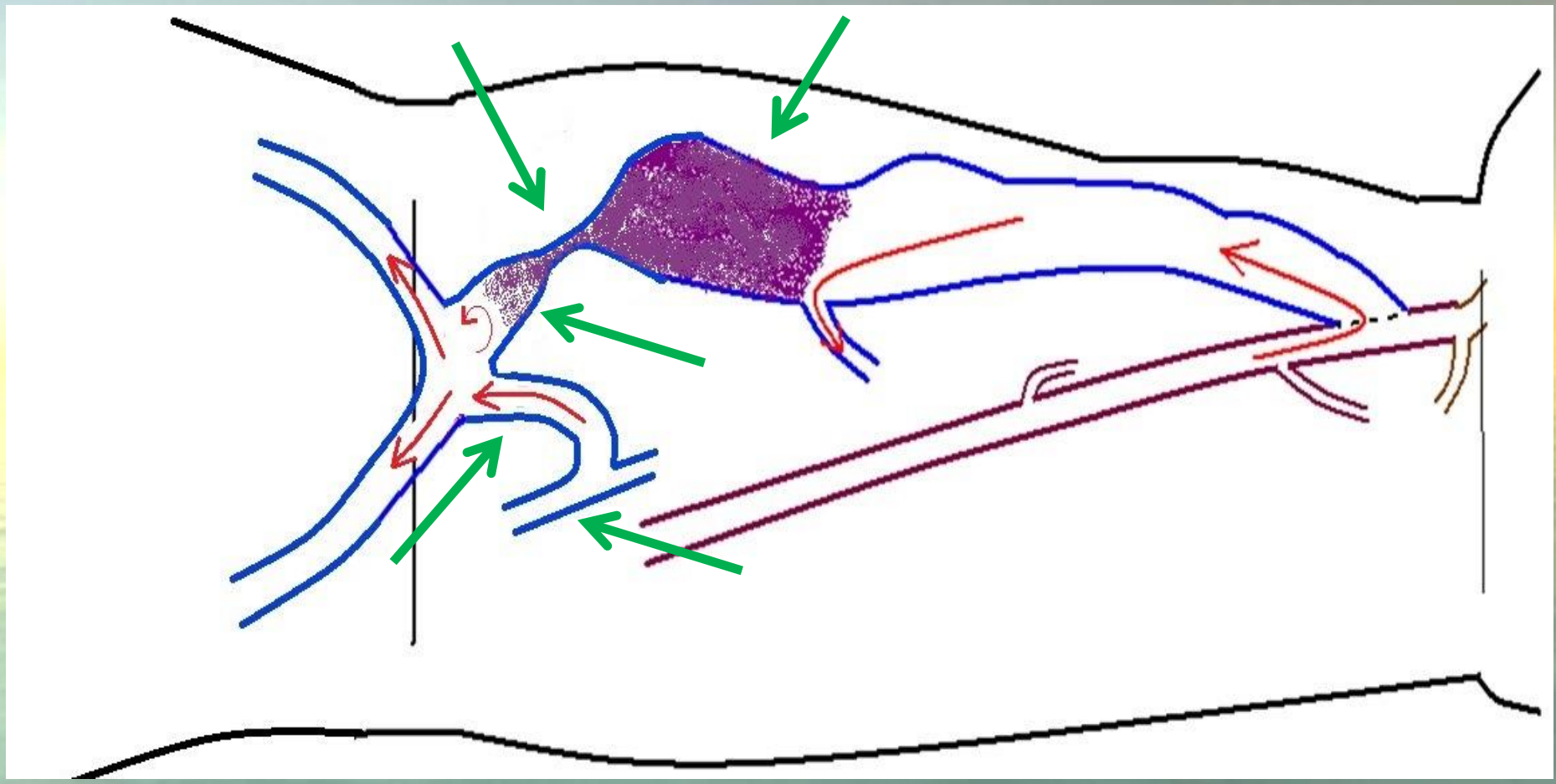


Before



After

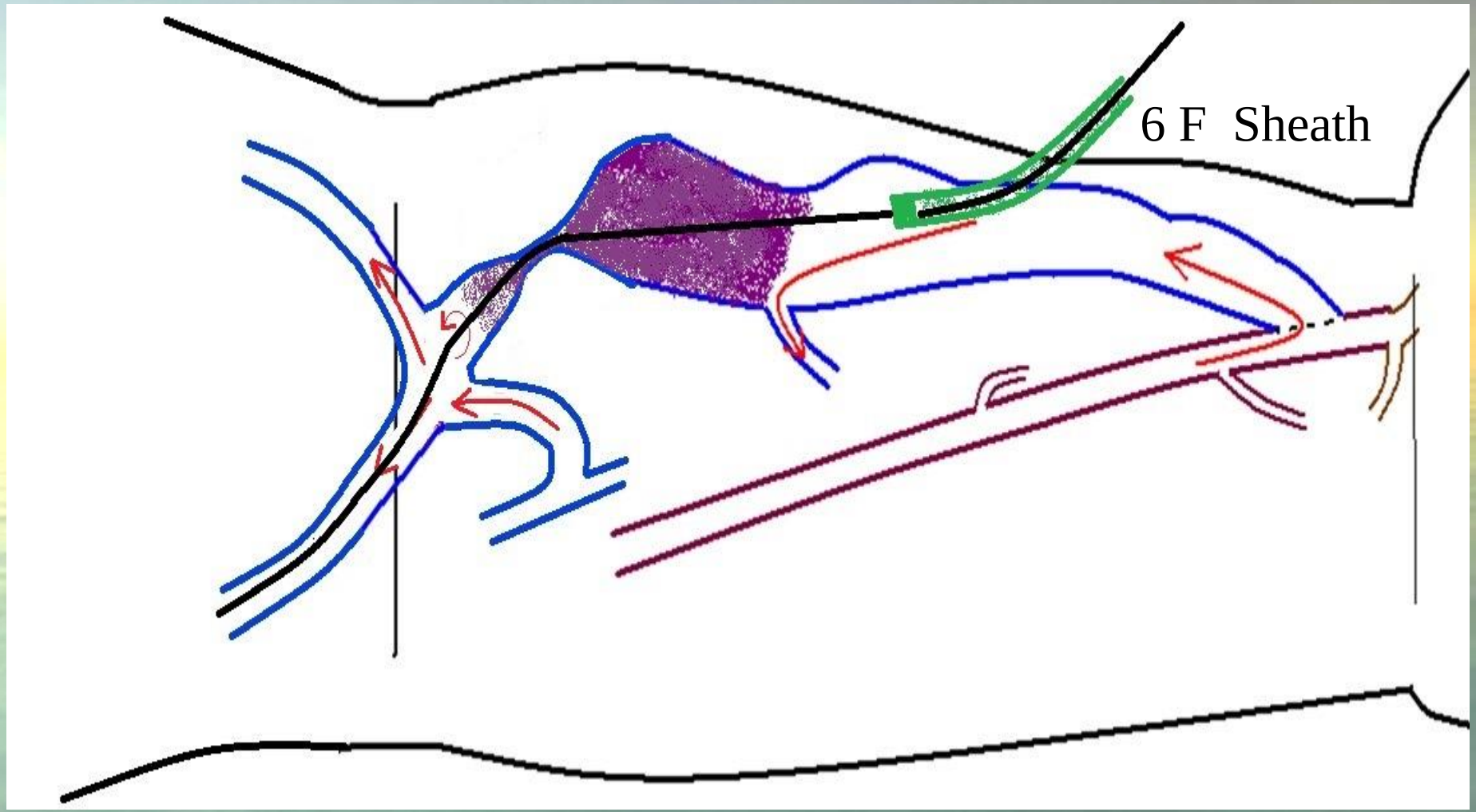
Limited Thrombosis
PROXIMAL



Limited Thrombosis
PROXIMAL

- More difficult
- Clot burden may be larger
- Danger of embolising the outflow!!
- Use “Flowering” technique on stent

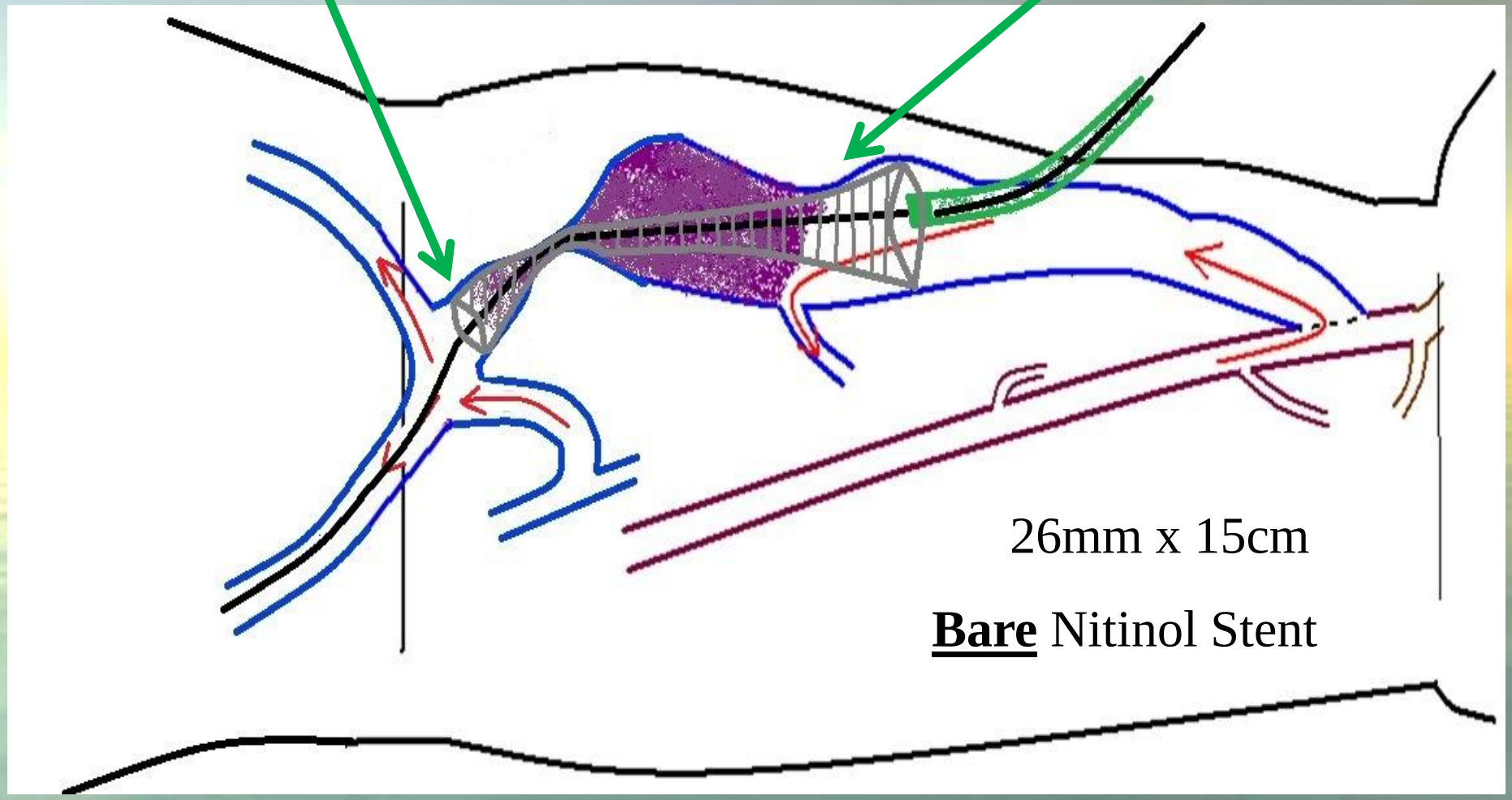
Limited Thrombosis
PROXIMAL



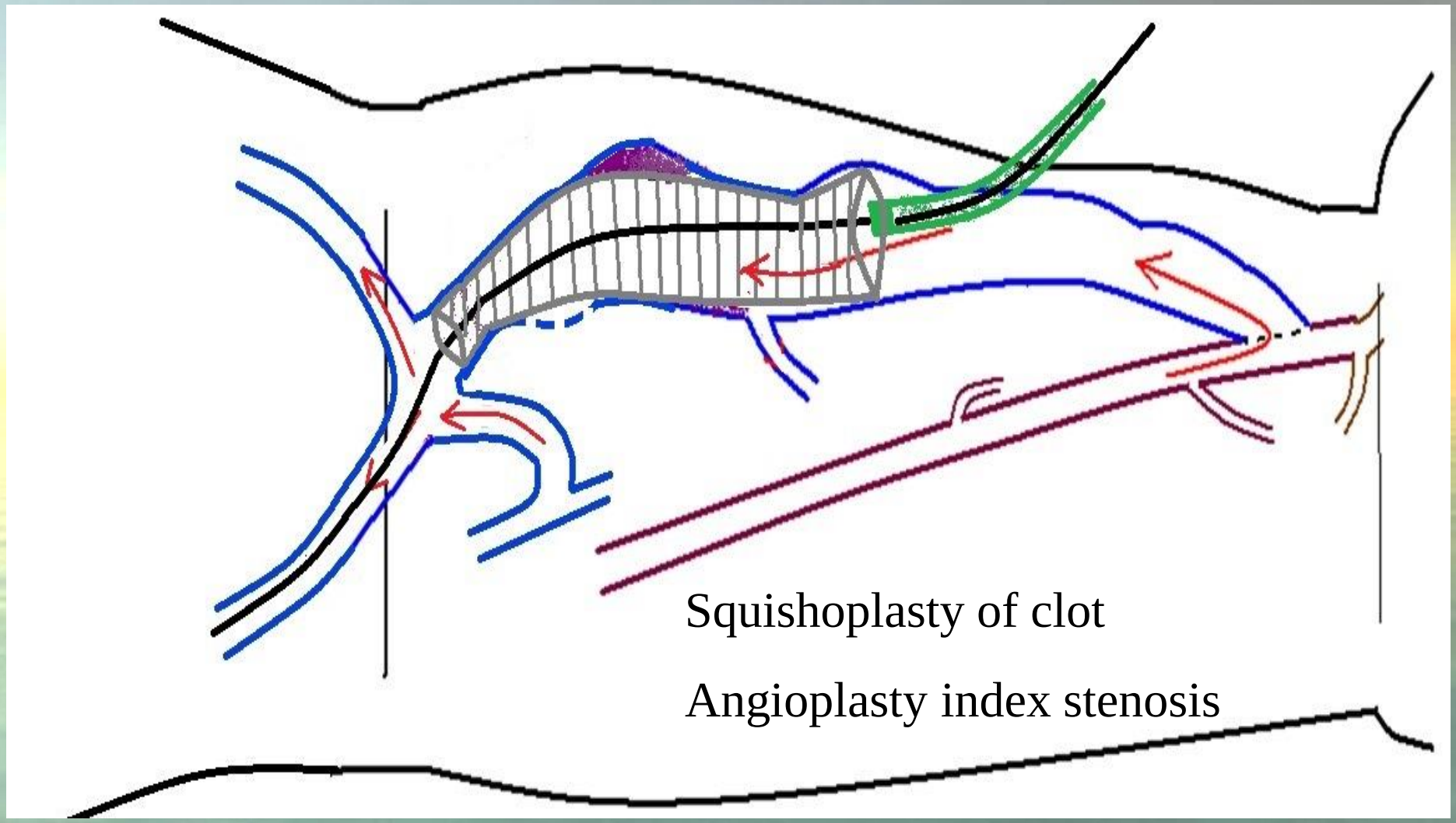
Limited Thrombosis
PROXIMAL

Stent “flowered” into outflow vein

Distal end stent lands past clot



Limited Thrombosis
PROXIMAL



EXTENSIVE THROMBOSIS

- Difficult

- Site of index lesion unknown

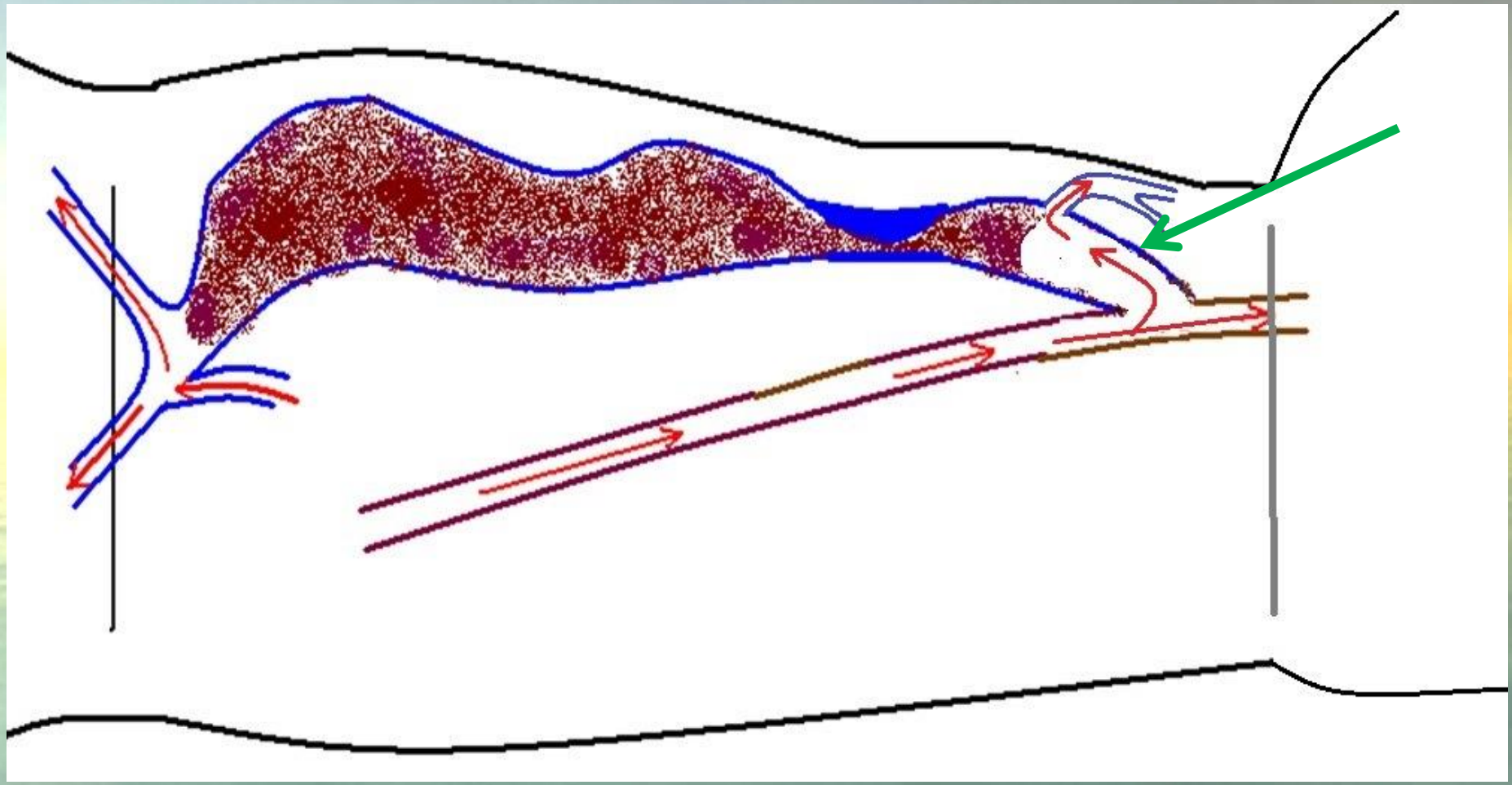
  Large clot burden

  Problems with access

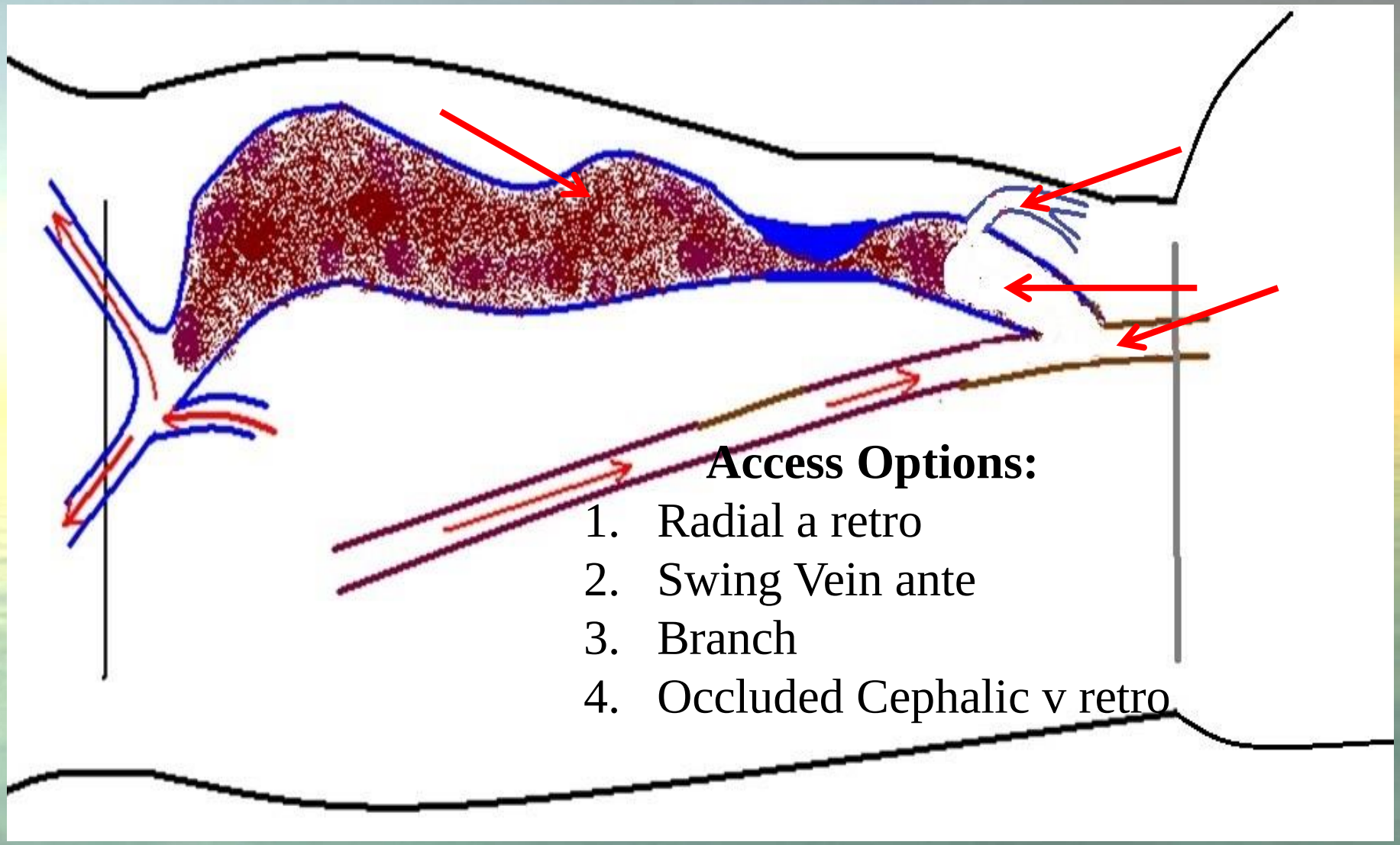
  Problems with inflow, outflow & useable

- Long operations (>2hours), multiple sheath (x3)
- Lots of stents!

EXTENSIVE THROMBOSIS



EXTENSIVE THROMBOSIS
Access



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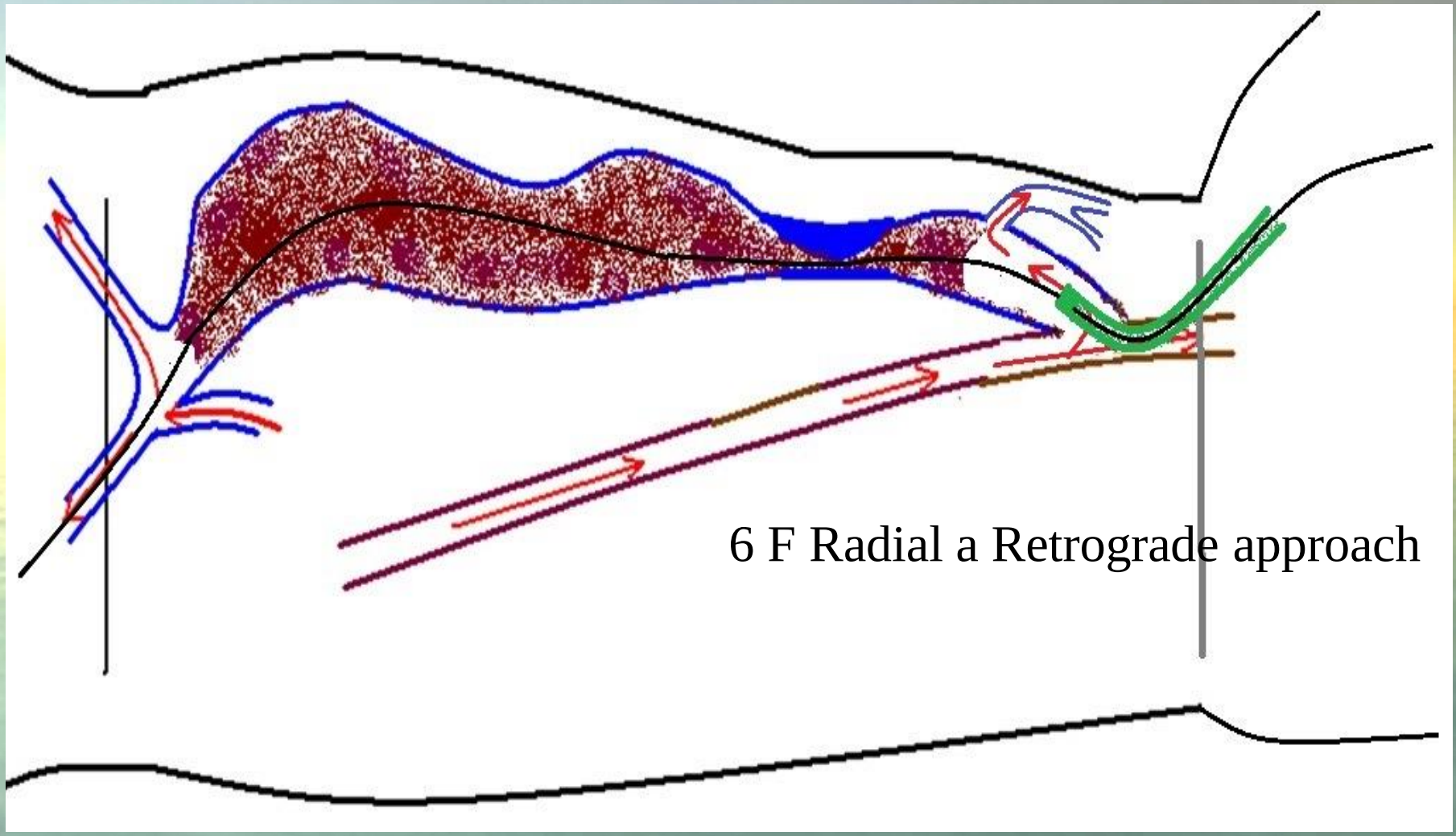

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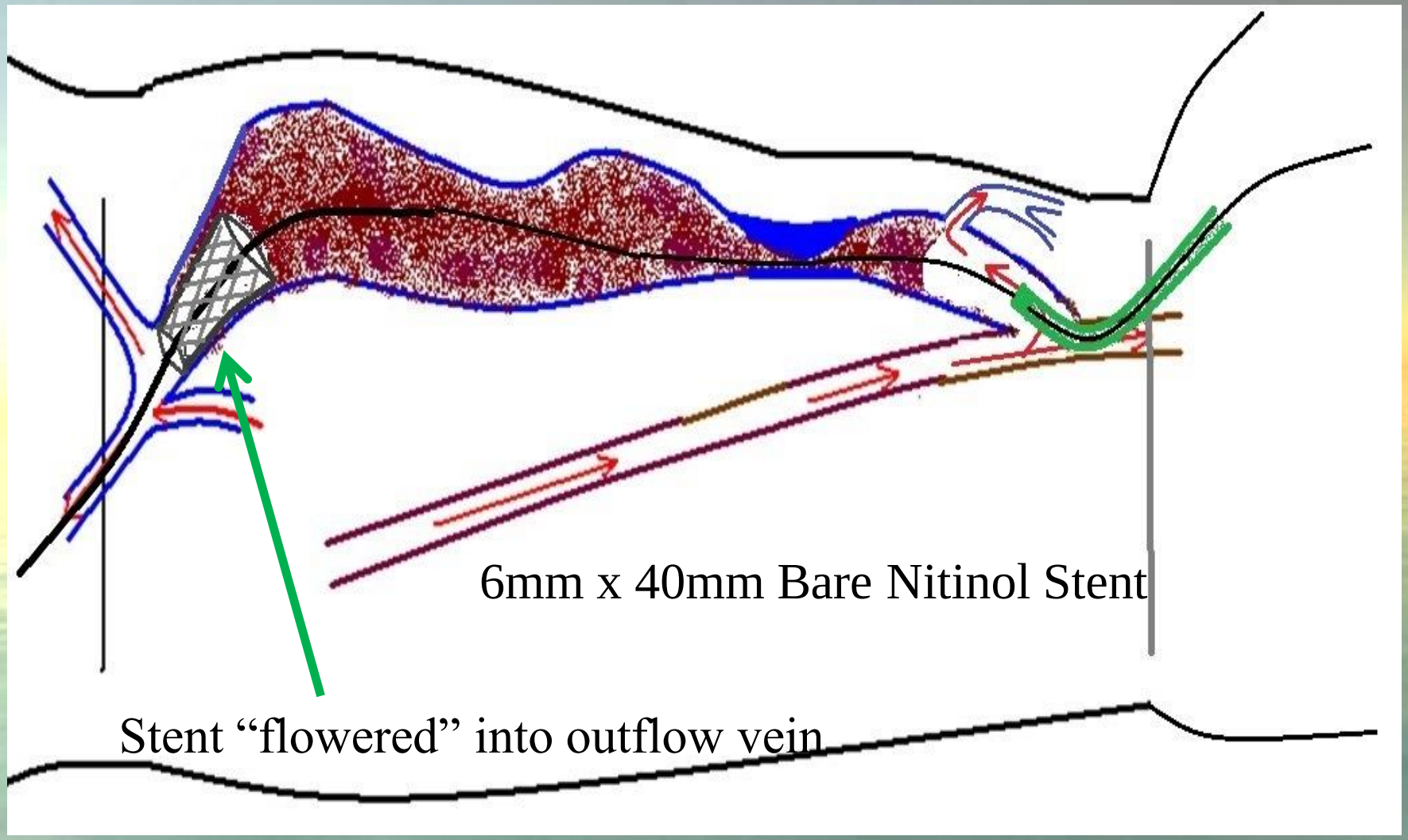

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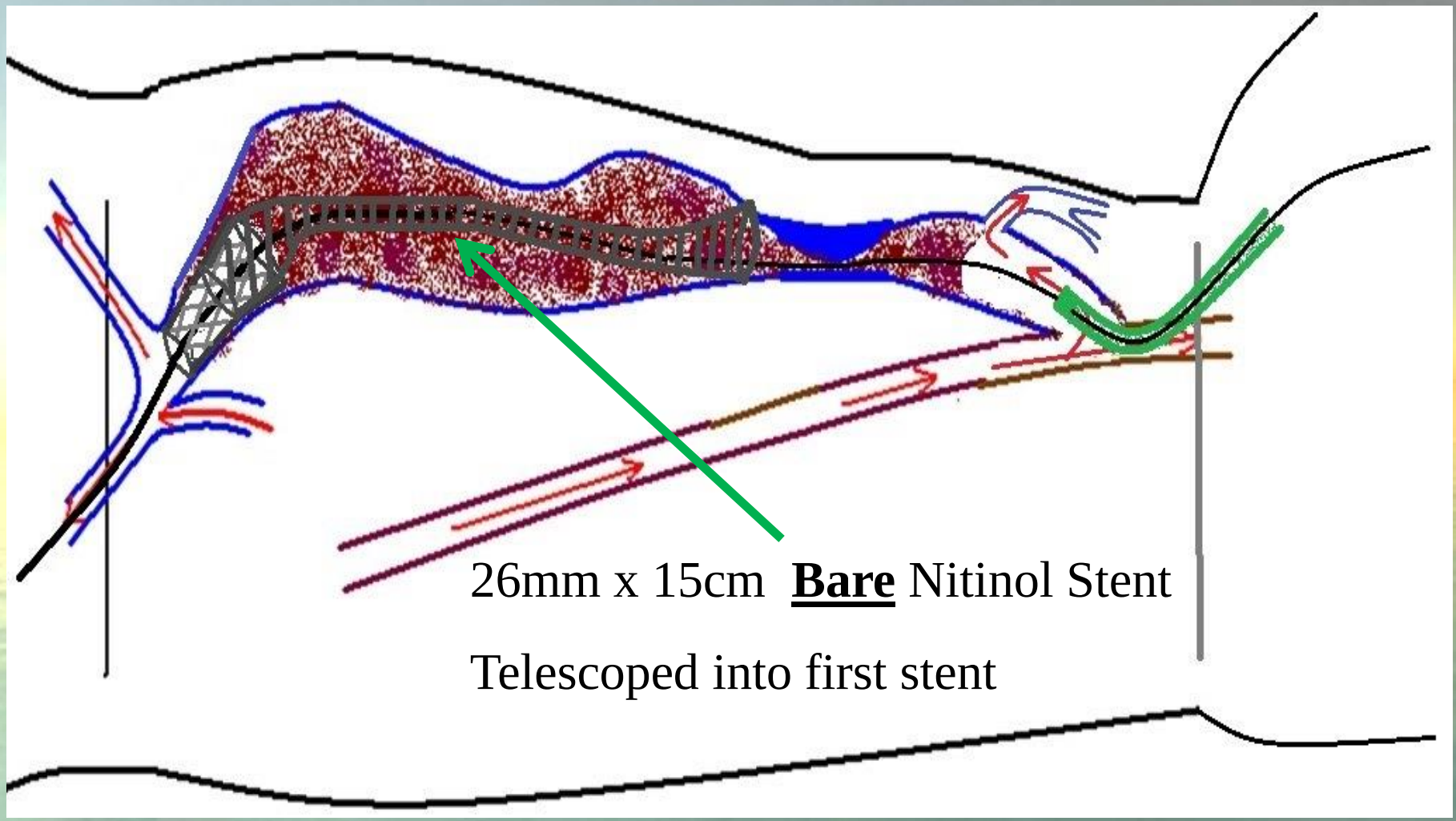
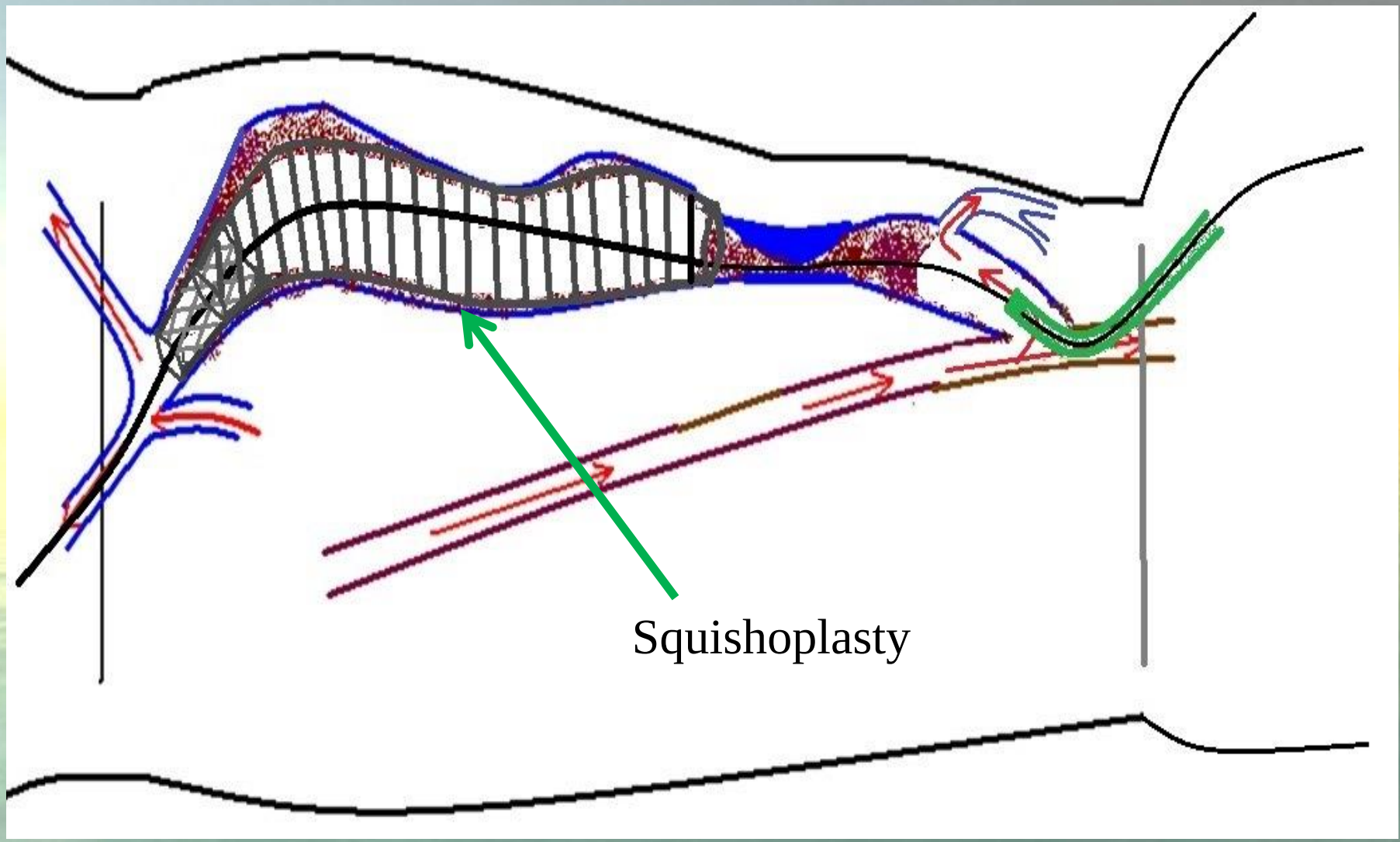


EXTENSIVE THROMBOSIS



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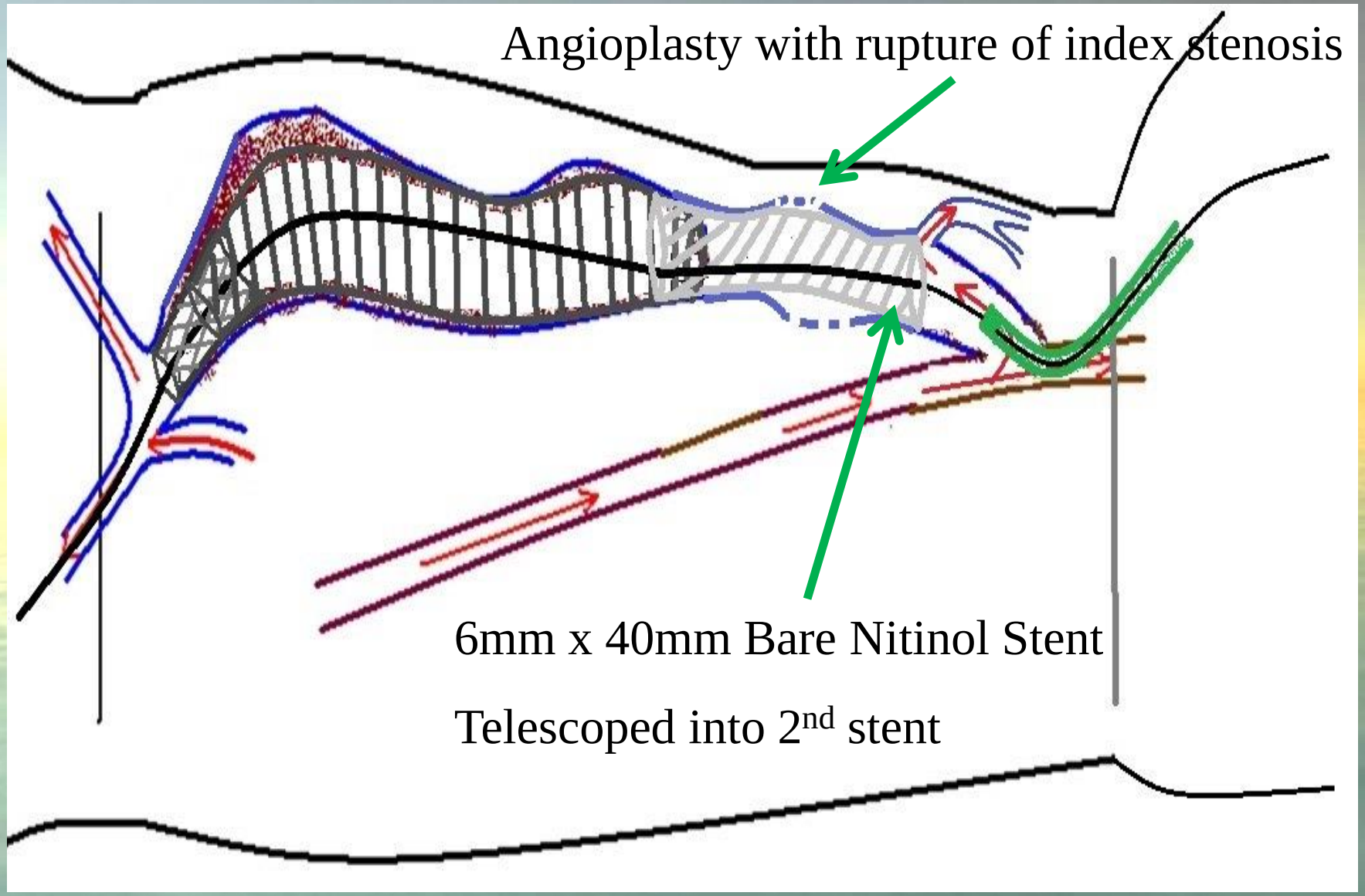
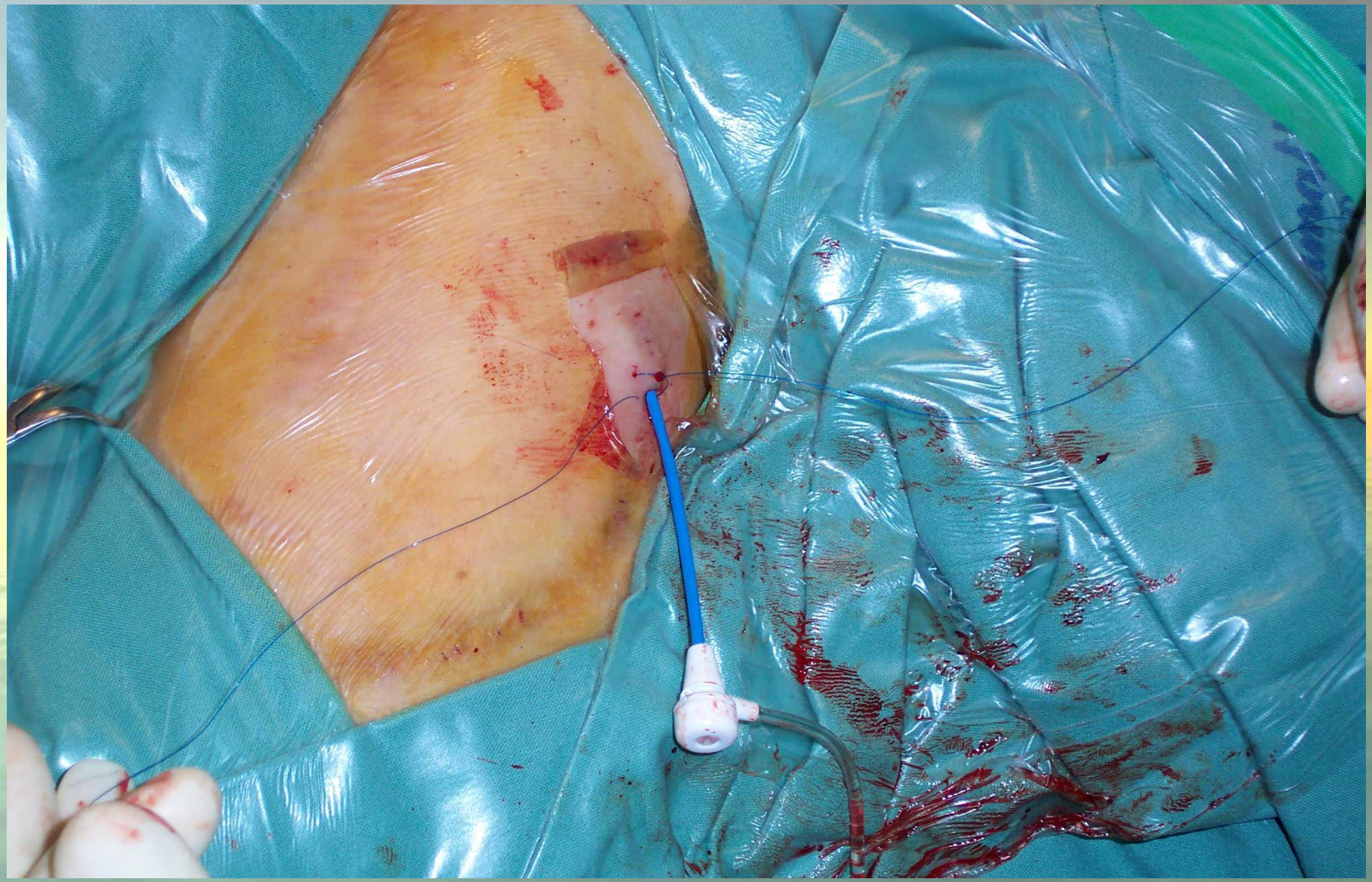


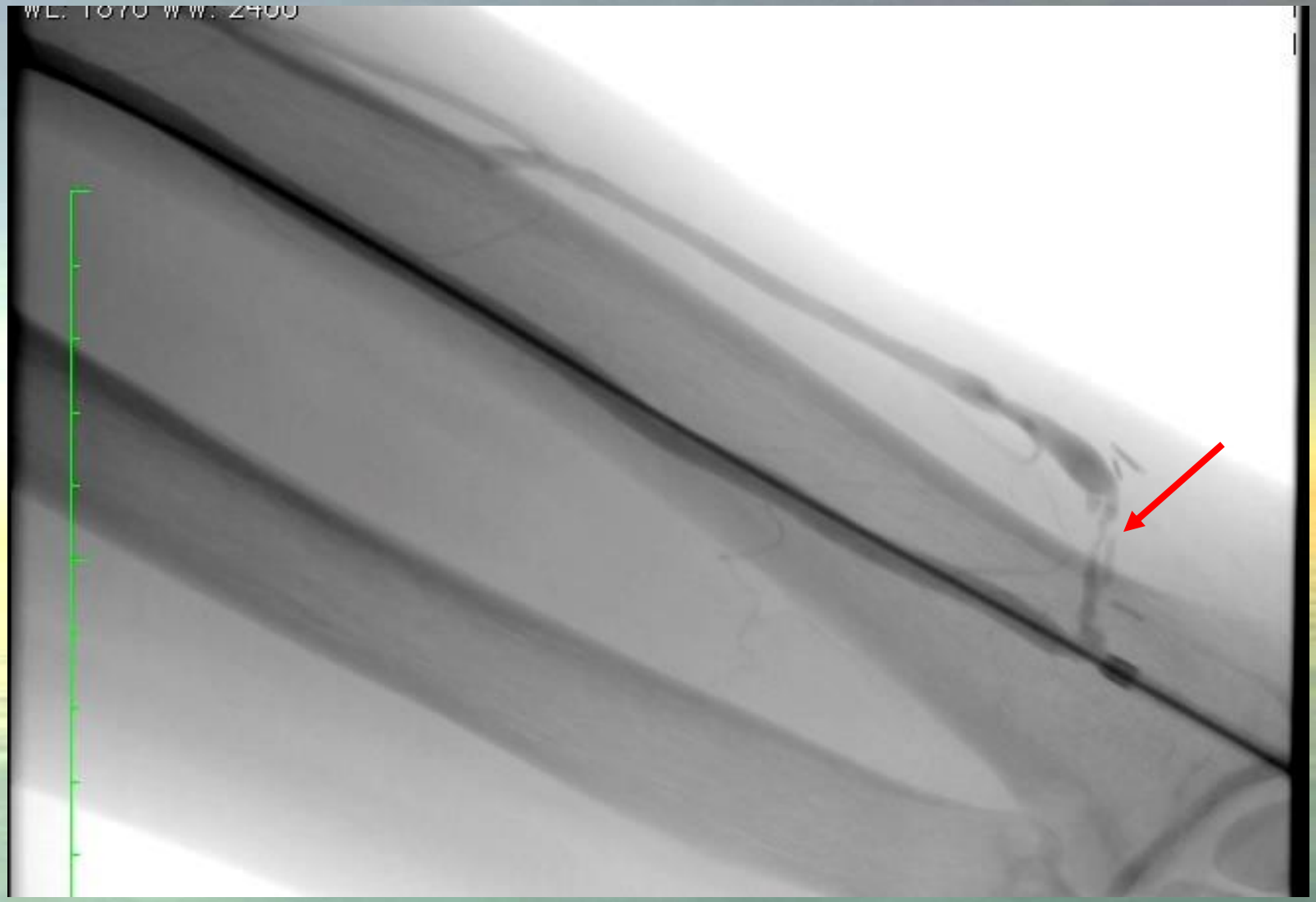
Stitch Closure of Puncture Sites



Post Operative Care

- Patient's arm is elevated
- Dialysis thru fistula immediate or within 24 hrs
- Aspirin / Plavix 1 month
- Early review with Duplex U/S

SWING VEIN STENOSIS RC AVF



24 Hours post op, ?occluded. Revised open x2 in OT last nite
Duplex u/s critical stenosis < 0,5mm

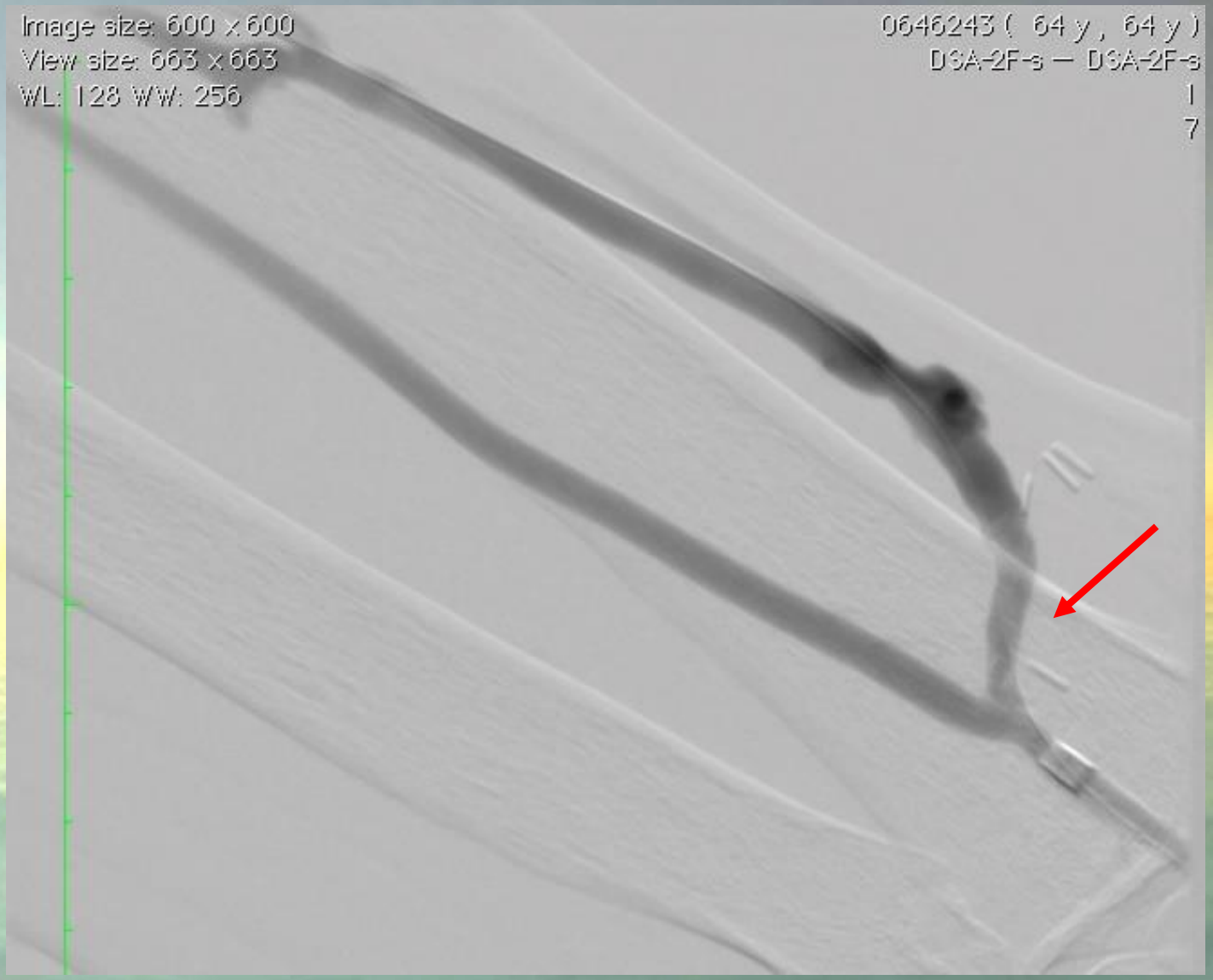
SWING VEIN STENOSIS BC AVF

5F sheath retrograde radial artery; 014” coronary wire

SWING VEIN STENOSIS BC AVF

3 x 20 non-compliant coronary balloon

SWING VEIN STENOSIS BC AVF



Completion

Post Operative Care

- Patient's arm is elevated
- Dialysis thru fistula immediate or within 24 hrs
- Aspirin / Plavix 1 month
- Early review with Duplex U/S

Results

January 2005 - December 2014

- 156 Endovascular Rx Occluded AVF

- Thrombus Burden: Large - 33%
  Moderate - 43%
  Minimal - 22%

- 18% receive a Vascath

- Mean time from Occlusion to Dialysis: 2 days

Results

- Anasthesia: Local - 39%
  Sedation - 35%
  GA - 11%
  Arm Block - 3%

- Operative Time: < 2 hours 86%
  > 2 hours 13%

- Day Stay: Day Case - 46%
  2 Days - 24%

Results

Technical Success Rate

96 %

Functional Success at 5 days

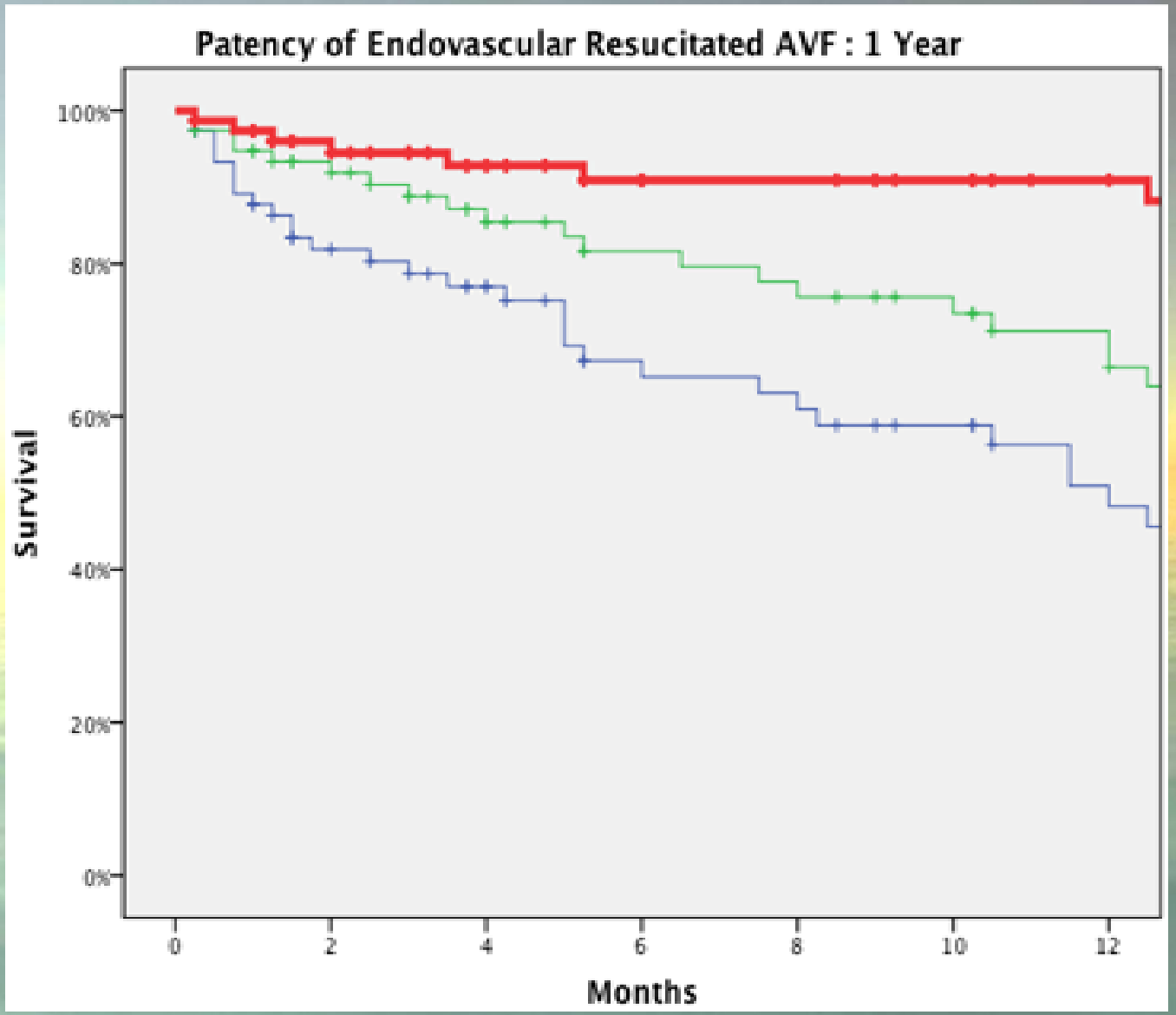
91%

Results at One Year

RED
2ary Patency

GREEN
Assisted
1ary Patency

BLUE
1ary Patency



88%

64%

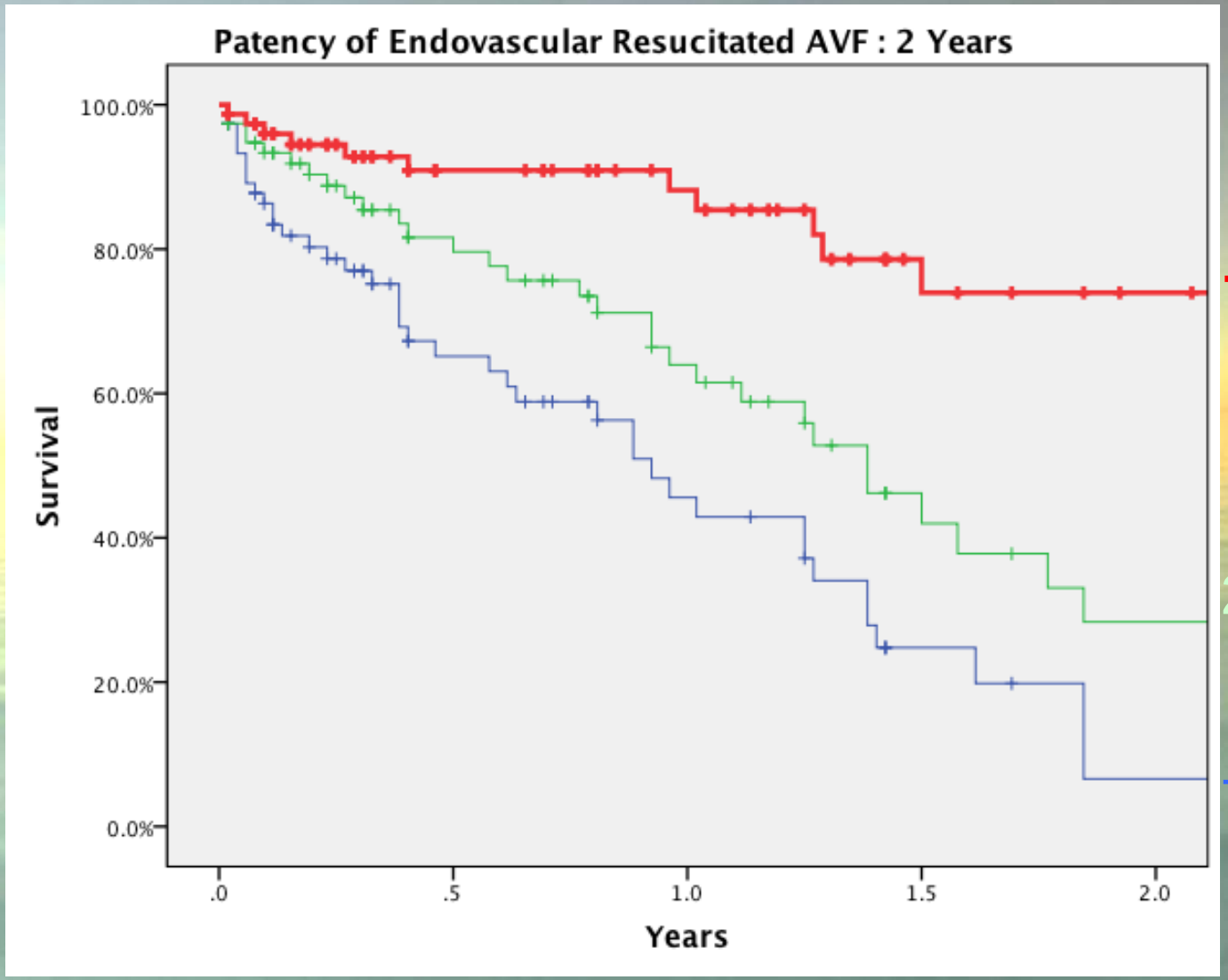
47%

Results at Two Years

RED
2ary Patency

GREEN
Assisted
1ary Patency

BLUE
1ary Patency



74%

28%

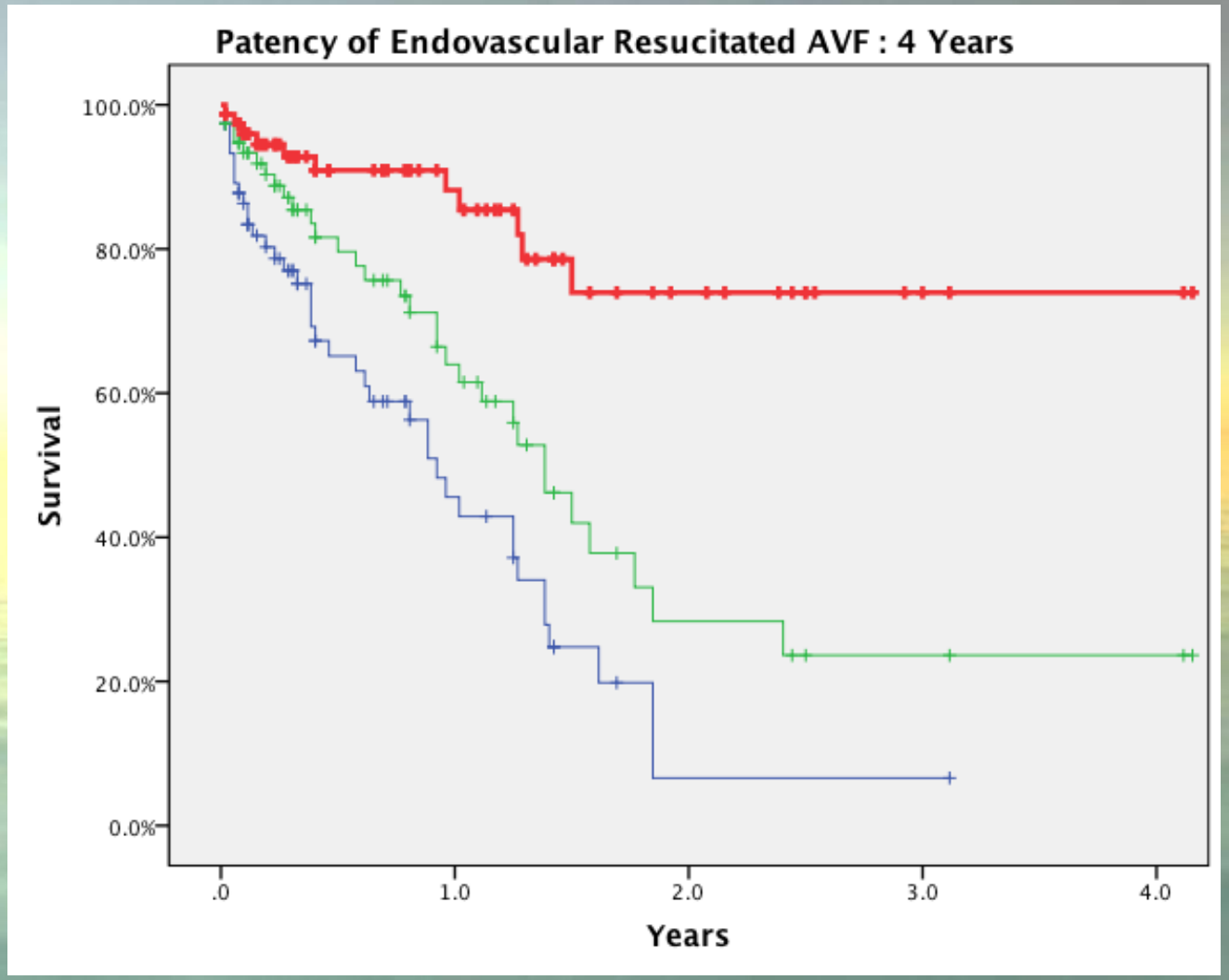
7%

Results at Four Years

RED
2ary Patency

GREEN
Assisted
1ary Patency

BLUE
1ary Patency



74%

24%

7% *

Thankyou For Your Attention