Update การดูแล Vascular access เพื่อให้สามารถใช้งานได้อย่างยาวนาน

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- Vascular access
  - AVF : Surgical creating fistula between artery and vein
  - AVG : Insertion of graft to connect artery and vein

How to prolong patency of vascular access ?

- Mornitor
  - Physical examination
  - Review laboratory
- Survilannce
  - Non invasive method require specialize equipment
    - Duplex Ultrasound
    - CT
    - Pressure measurement (most are measureduring on hemodialysis machine)
      - Ultrasound dilution
      - Variable flow ultrasound
      - Glucose pump test
      - Transcutaneous access flow mornitor
      - Thermodilution
      - Access recirculation
      - ETC.

Acuuracy of Duplex Ultrasound(DU)

- Good correlation between blood flow (Qa) by DU and dilutional method
- Both method are recommend in spainish guideline
- Metaanalysis of RCT by Tonelli et al.
  - Qa or DU base screening significantly decrease risk of AVF thrombosis
- Aragoncillo et al. 2016 : prospective , multicenter RCT
  - Conclude DU and US dilution technique reduce frequency of trhrombosis

- What kind of imaging exploration should be done in suspicious of stenosis ?

- Can duplex Ultrasound replace the angiography as the gold standard for confirming the suspicious ?

- Meta-analysis 2013
  - 755 patients from four study
    - 319 : fistulography
      - 89.3% Sens. and 94.7% spec. of DU relate fistulogram
- However
  - it's not sufficient to consider DU or fistulogram to "gold standard"
- Non-invasive , functional information and cost effective value
  - Duplex Ultrasound : Best initial diagnosis strategy
  - Fistulogram : reserve for negative DU and persistent suspicious of stenosis

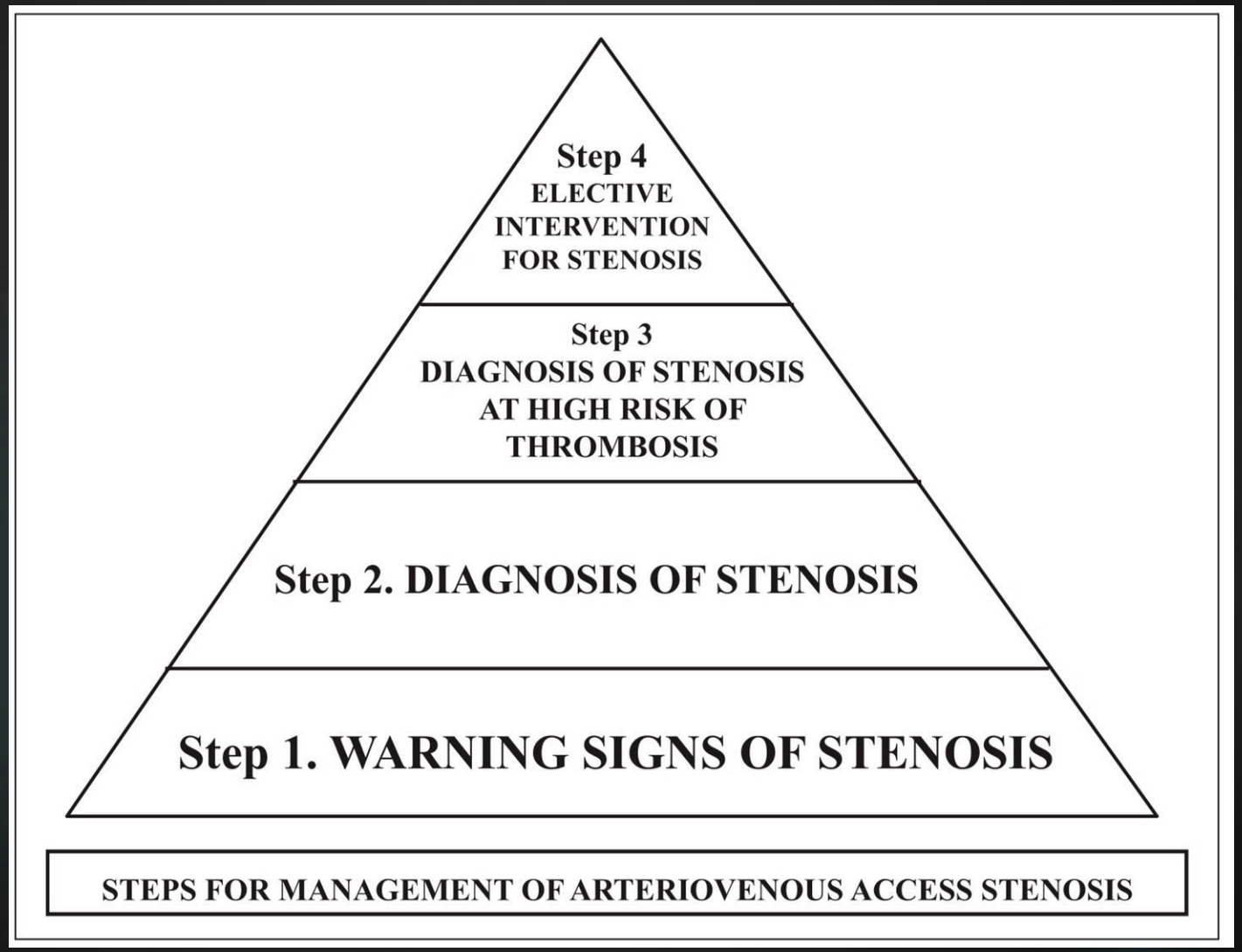
Diagnosis of Arteriovenous access(AVA) stenosis

- Significant stenosis with high risk thrombosis
  - Reduction in lumen > 50% + PSV ratio >2
  - Combind with atlease one of this criteria
    - Residual diameter < 2 mm
    - Qa < 600 mL/min in AVG , < 500 mL/min in AVF
    - Decrease in Qa > 25% in Qa > 1000 mL/min
- Borderline or low risk thrombosis
  - Reduction in lumen > 50% + PSV ratio >2
  - Without any additional criteria

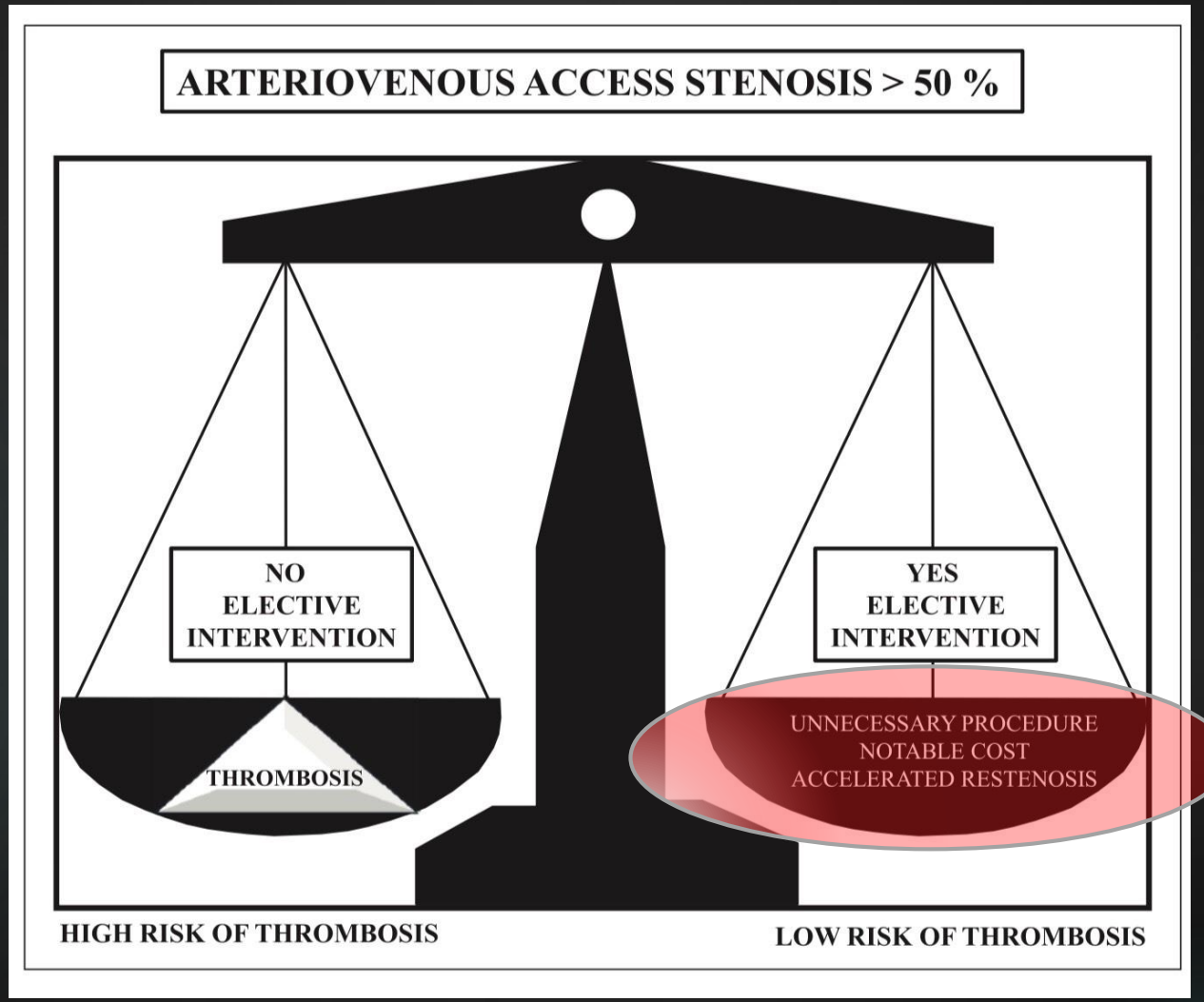
Management after diagnosis

- High risk group
  - Elective treat with “PTA”
- Borderline or low risk group
  - Wait and watch
- F/U 102 borderline stenosis 14 +/- 6 wk
  - 55 without progression
  - 38 increase degree stenosis
  - 8 treat with PTA
  - 1 thrombosis

Summary


Step 4
ELECTIVE
INTERVENTION
FOR STENOSIS
Step 3
DIAGNOSIS OF STENOSIS
AT HIGH RISK OF
THROMBOSIS
Step 2. DIAGNOSIS OF STENOSIS
Step 1. WARNING SIGNS OF STENOSIS
STEPS FOR MANAGEMENT OF ARTERIOVENOUS ACCESS STENOSIS

Summary


ARTERIOVENOUS ACCESS STENOSIS > 50 %
NO ELECTIVE INTERVENTION
YES ELECTIVE INTERVENTION
THROMBOSIS
UNNECESSARY PROCEDURE
NOTABLE COST
ACCELERATED RESTENOSIS
HIGH RISK OF THROMBOSIS
LOW RISK OF THROMBOSIS

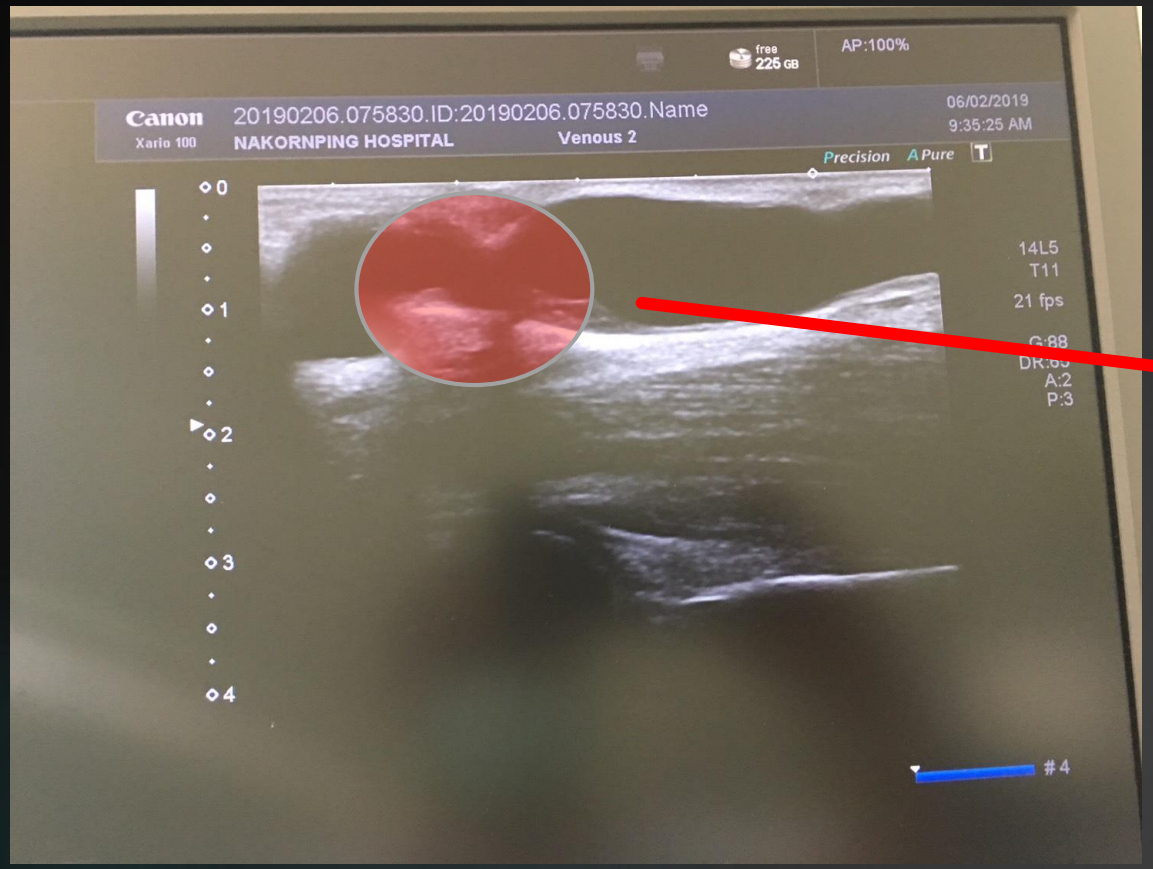
Summary

- Criteria for intervention : PTA / Surgery
  - Lumen reduction > 50%
  - PSV ratio > 2
  - Residual lumen < 2 mm
  - Qa < 500 in AVF , < 600 in AVG
  - Decrease in Qa > 25% if Qa > 1000 mL/min

Female 42 year old

Good function of AVF

Thrill at proximal and mid cephalic AVF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Precision
A Pure
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14L5
T11
21 fps
G:88
A:2
P:3
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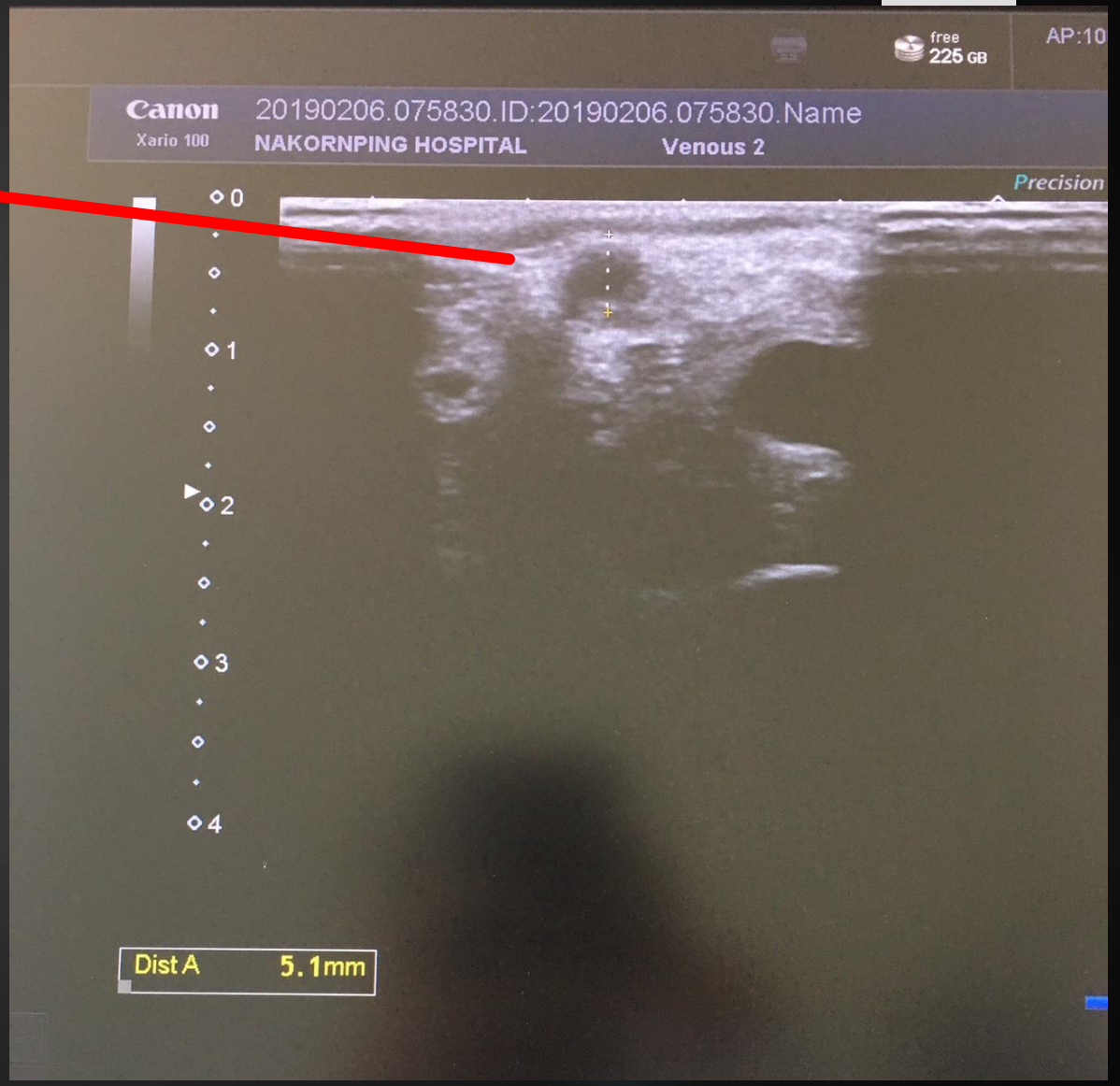
Venous 2
Precision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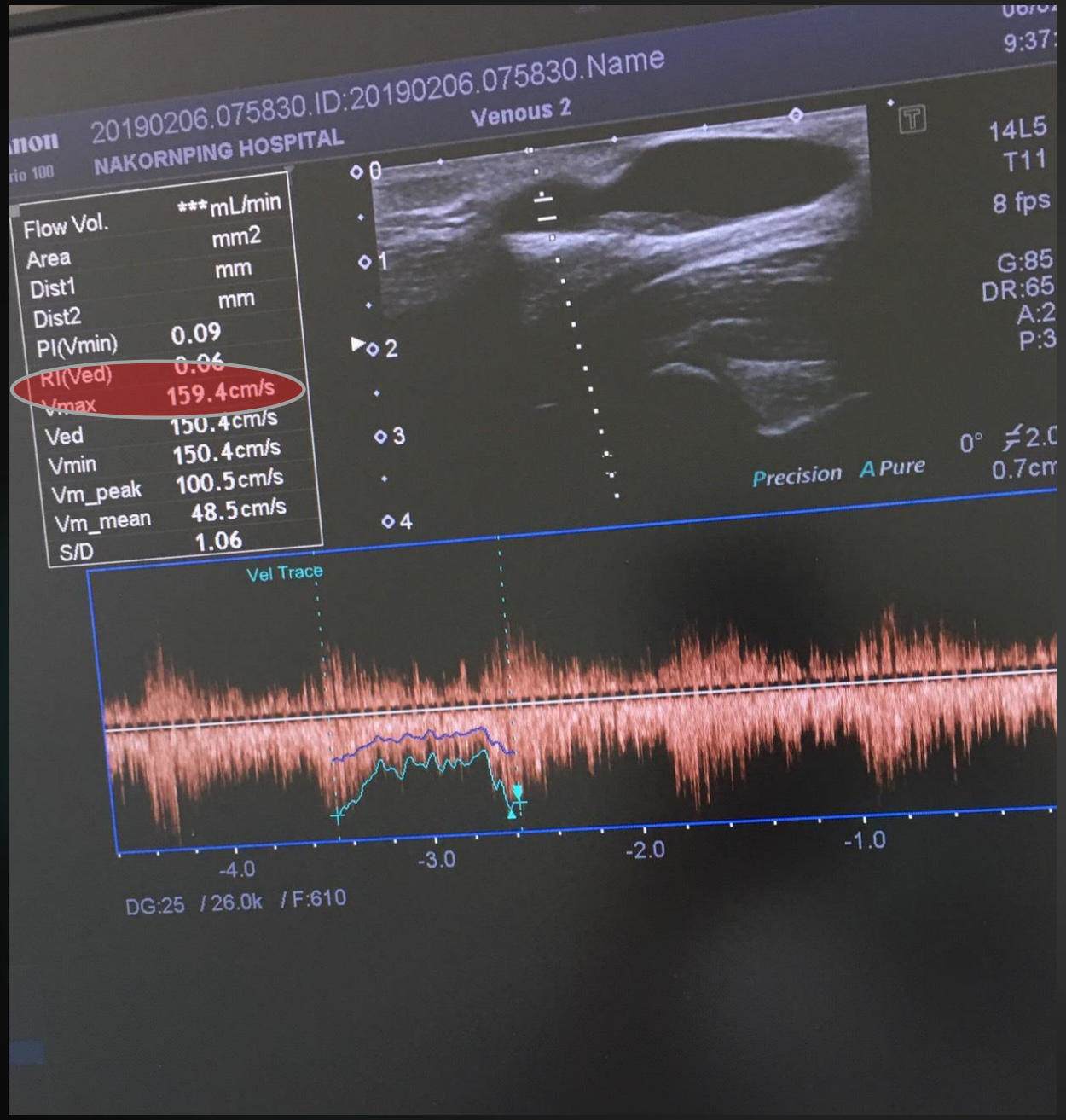
Precision
Dist A
5.1mm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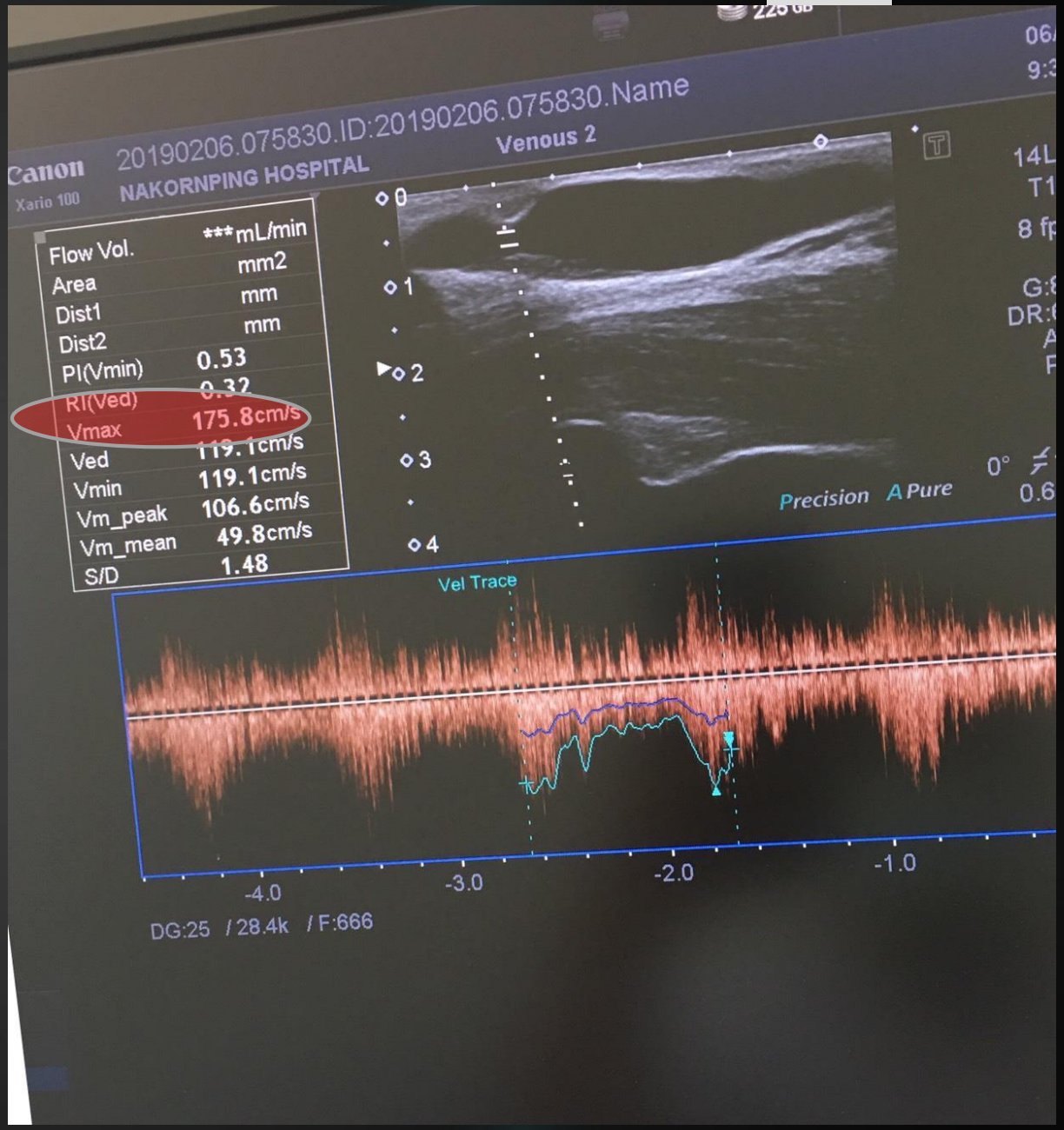
Venous 2
Flow Vol. ***mL/min
Area mm2
Dist1 mm
Dist2 mm
PI(Vmin) 0.09
RI(Ved) 0.06
Vmax 159.4cm/s
Ved 150.4cm/s
Vmin 150.4cm/s
Vm_peak 100.5cm/s
Vm_mean 48.5cm/s
S/D 1.06
14L5
T11
8 fps
G:85
DR:65
A:2
P:3
Precision A Pure
Vel Trace
-4.0
-3.0
-2.0
-1.0
DG:25 / 26.0k / F:610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Venous 2
Flow Vol. ***mL/min
Area mm2
Dist1 mm
Dist2 mm
PI(Vmin) 0.53
RI(Ved) 0.32
Vmax 175.8cm/s
Ved 119.1cm/s
Vmin 119.1cm/s
Vm_peak 106.6cm/s
Vm_mean 49.8cm/s
S/D 1.48
Precision A Pure
Vel Trace
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-3.0
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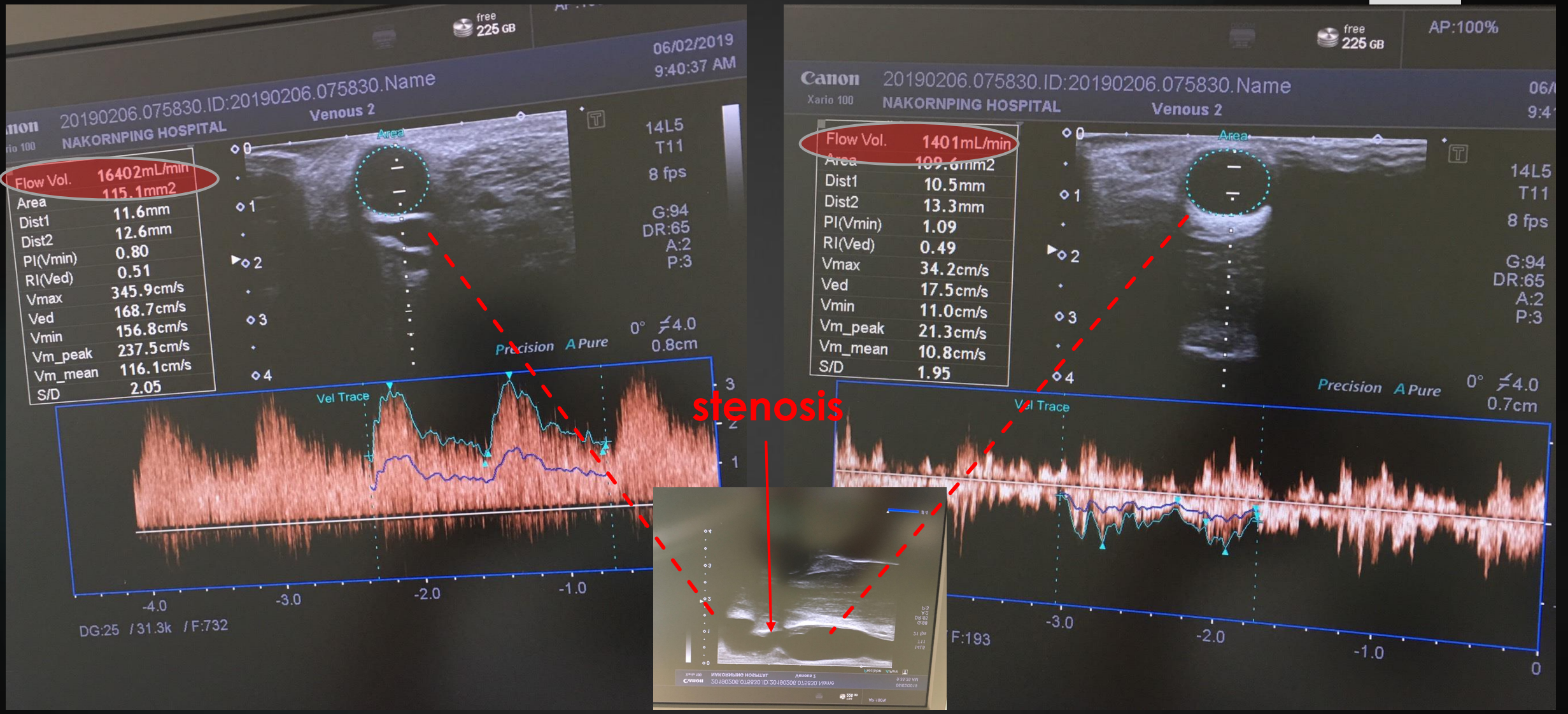
-1.0
DG:25 / 28.4k / F:666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Flow Vol. 16402mL/min
Area 115.1mm2
Dist1 11.6mm
Dist2 12.6mm
PI(Vmin) 0.80
RI(Ved) 0.51
Vmax 345.9cm/s
Ved 168.7cm/s
Vmin 156.8cm/s
Vm_peak 237.5cm/s
Vm_mean 116.1cm/s
S/D 2.05
14L5
T11
8 fps
G:94
DR:65
A:2
P:3
Area
Vel Trace
Precision A Pure
0° 4.0
0.8cm
-4.0
-3.0
-2.0
-1.0
DG:25 / 31.3k / F:732
stenosis
free 225 GB
AP:100%
Canon
Xario 100
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Venous 2
Flow Vol. 1401mL/min
Dist1 10.5mm
Dist2 13.3mm
PI(Vmin) 1.09
RI(Ved) 0.49
Vmax 34.2cm/s
Ved 17.5cm/s
Vmin 11.0cm/s
Vm_peak 21.3cm/s
Vm_mean 10.8cm/s
S/D 1.95
14L5
T11
8 fps
G:94
DR:65
A:2
P:3
Area
Vel Trace
Precision A Pure
0° 4.0
0.7cm
-3.0
-2.0
-1.0
0
F:193

Thank you