

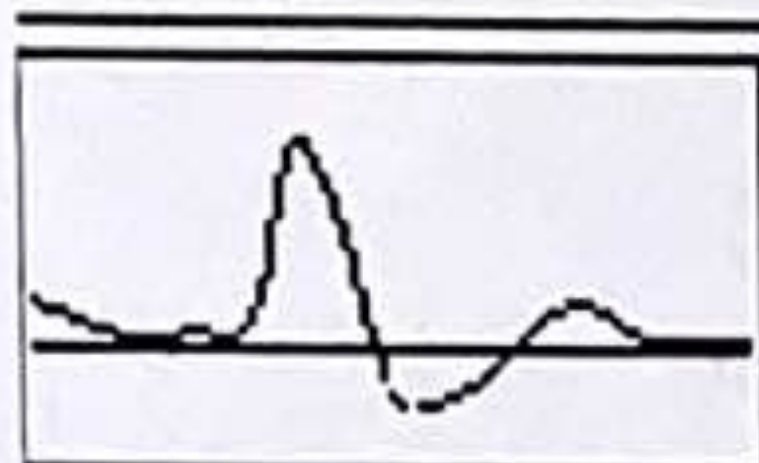


Reason Routine
Outcome Stenosis moderate, Stenosis severe, Occlusion, Diseased

Right

Left

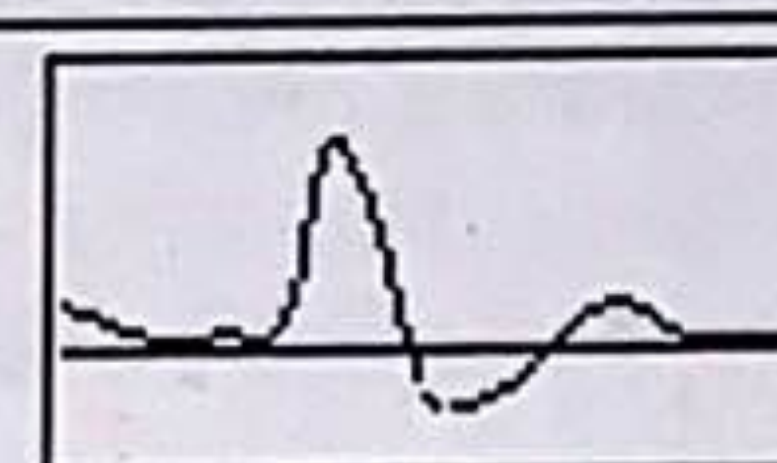
Brachial



Good

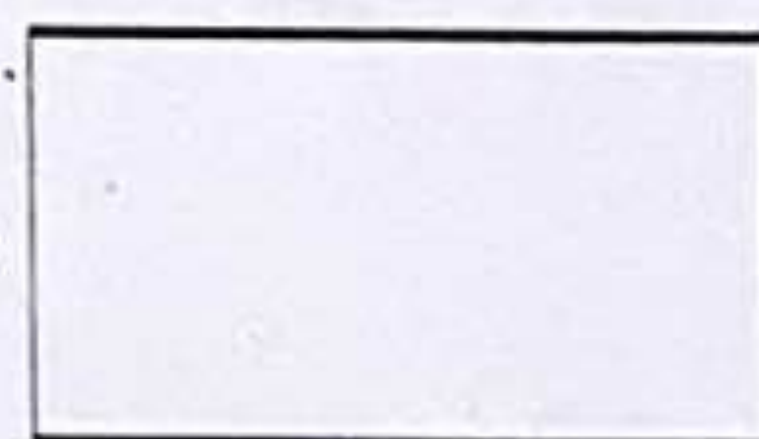
Common Femoral

Good



High Thigh

Low Thigh

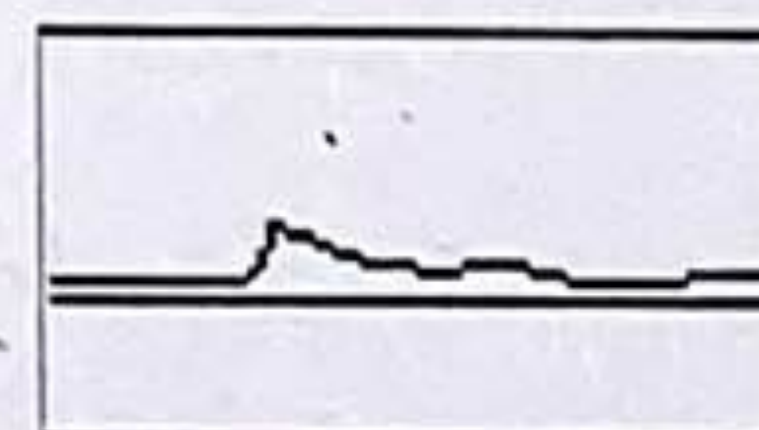


Absent

Popliteal

High Calf

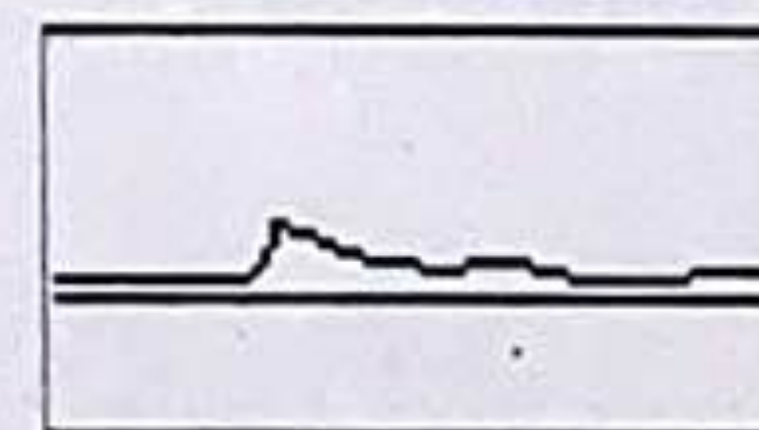
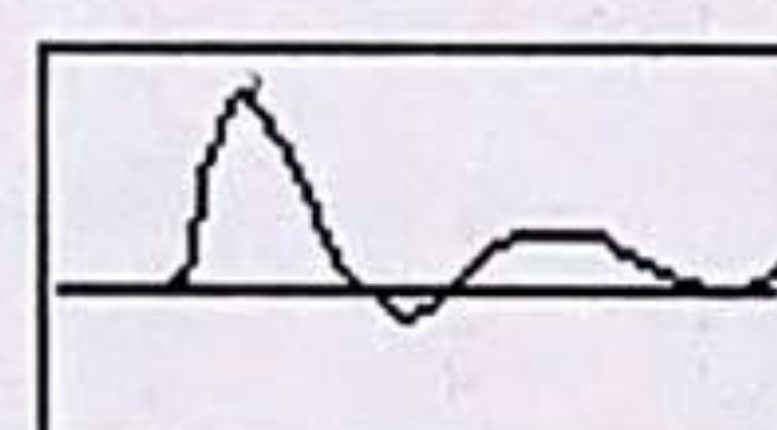
Peroneal



Weak

Anterior Tibial

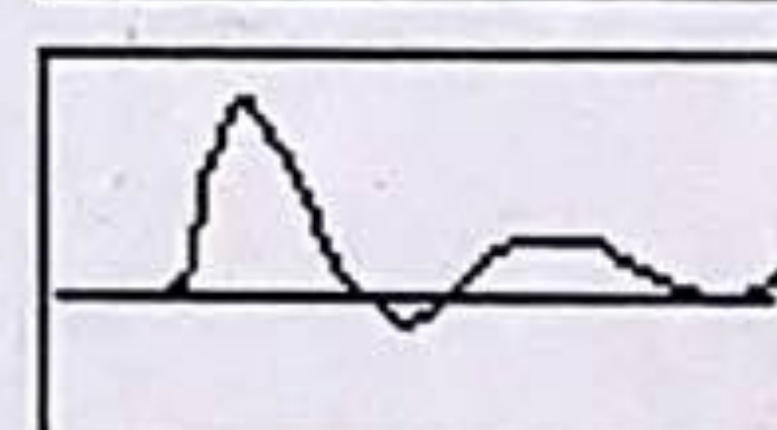
Good



Weak

Posterior Tibial

Good



Dorsalis Pedis

Toe Pressure

Post Exercise

Notes

RIGHT LOWER LIMB ARTERIAL DUPLEX

CFA: Patent, mild calcified disease with good triphasic waveforms, PSV 129cm/s.

PFA: Widely patent with good biphasic waveforms, PSV 97cm/s.

SFA: Patent prox-mid vessel with mild calcified disease, good triphasic waveforms, PSV 59-72cm/s.

Mod/severe calcified stenosis identified in the mid-distal vessel measuring ~1.05cm (47cm from MM) with velocities increasing from PSV 55cm/s to PSV 207cm/s, falling to PSV 13cm/s distally, weak monophasic waveforms. No flow identified in the very distal SFA/adductor canal, which appears to occlude with

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echolucent ?soft plaque ?thrombus (38 cm from MM).

POPA: Proximal vessel appears occluded with echolucent ?soft plaque ?thrombus ?acute occlusion. Small channel of weak flow noted in mid vessel. Distal vessel appears occluded with echolucent ?soft plaque. No flow identified in TPT, vessel run off poorly visualised.

ATA: Vessel appears patent along length with calcified vessel walls, reduced monophasic waveforms proximally PSV 27cm/s, changing to weak monophasic waveforms at the ankle, PSV 15cm/s.

PTA: Prox-mid vessel appears patent with calcified vessel walls, weak monophasic waveforms, PSV 22cm/s. Mid-distal vessel appears occluded, with no flow identified at the ankle.

PerA: No flow identified at the ankle, ?occluded.

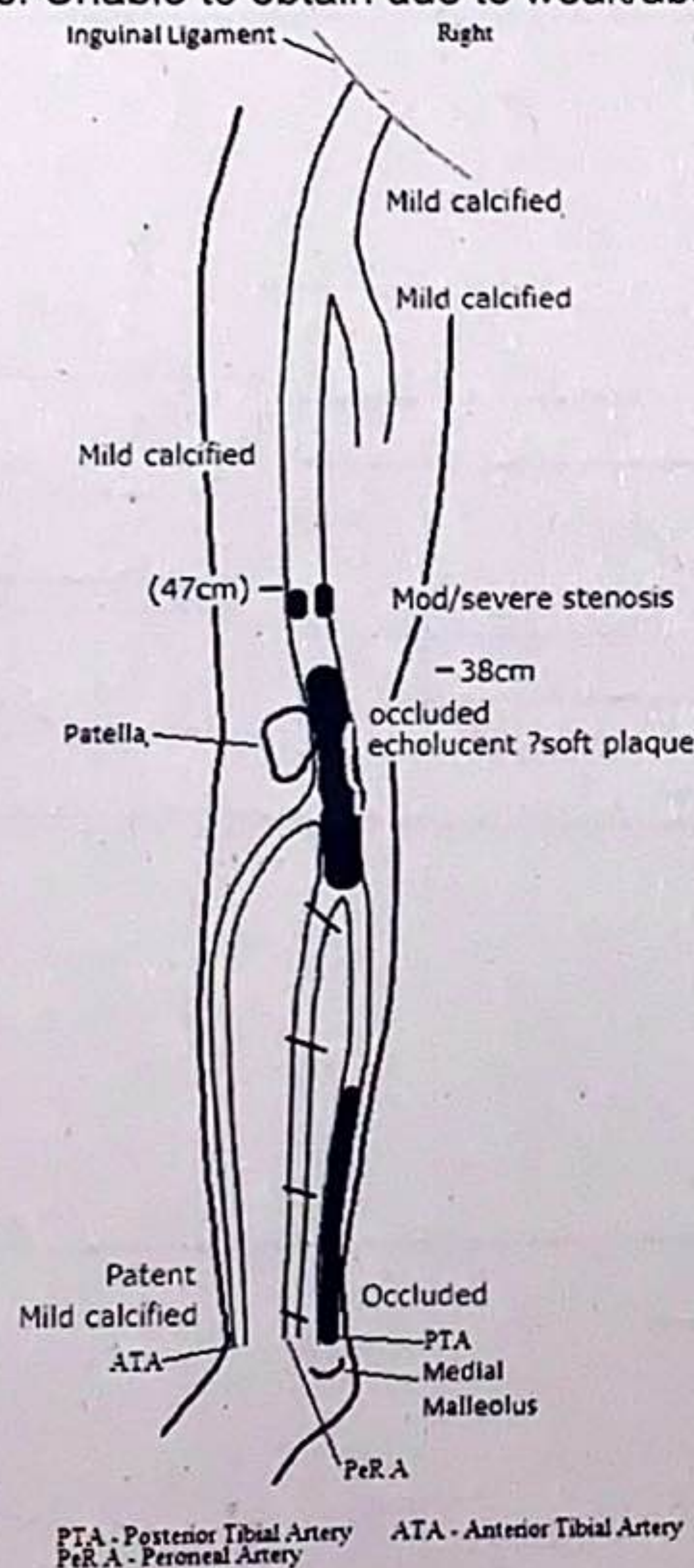
LEFT

CFA: Patent, mild calcified disease with good triphasic waveforms, PSV 143cm/s.

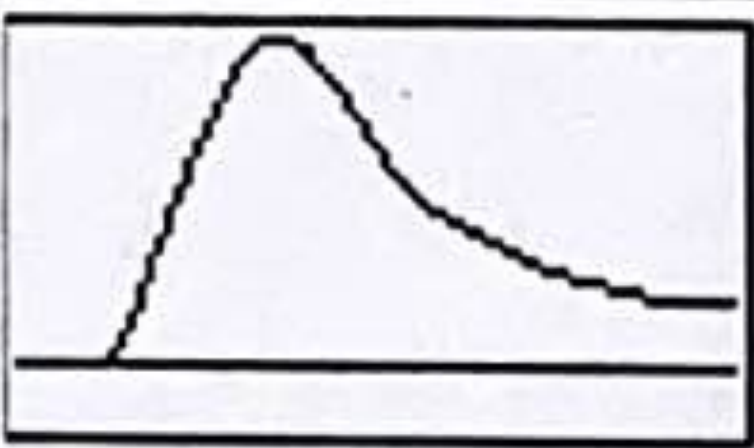
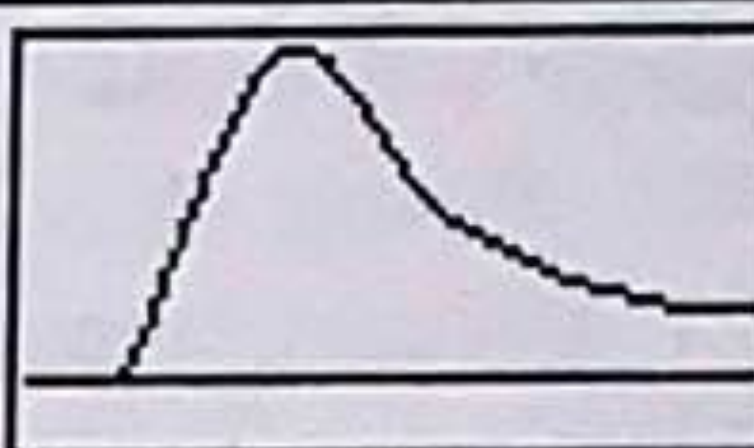
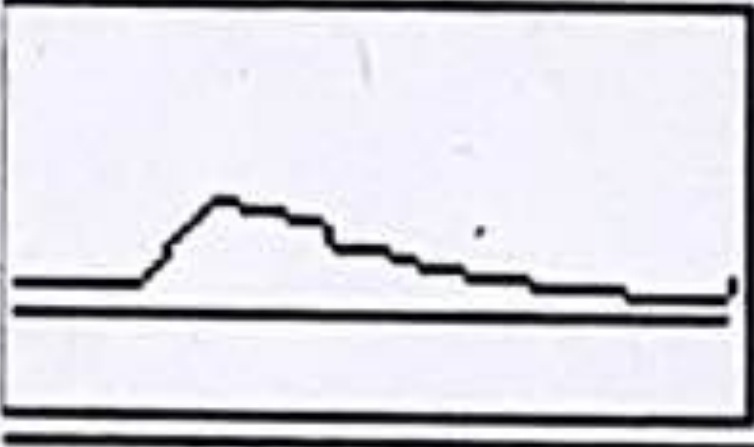
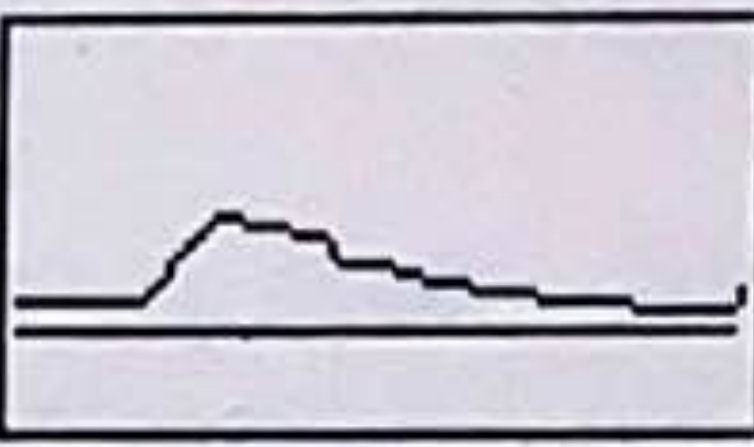
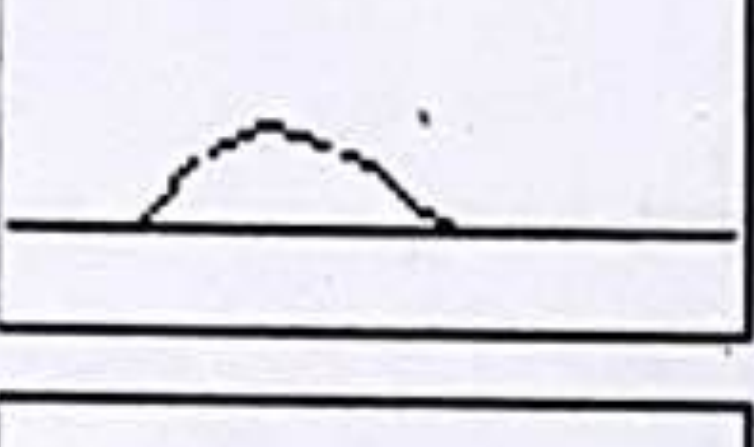
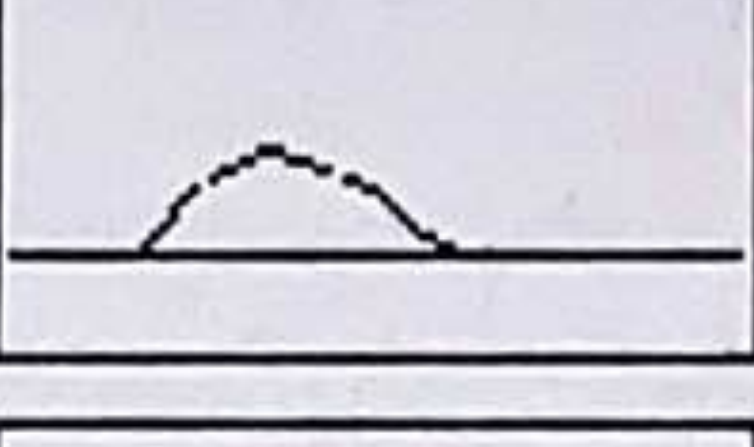

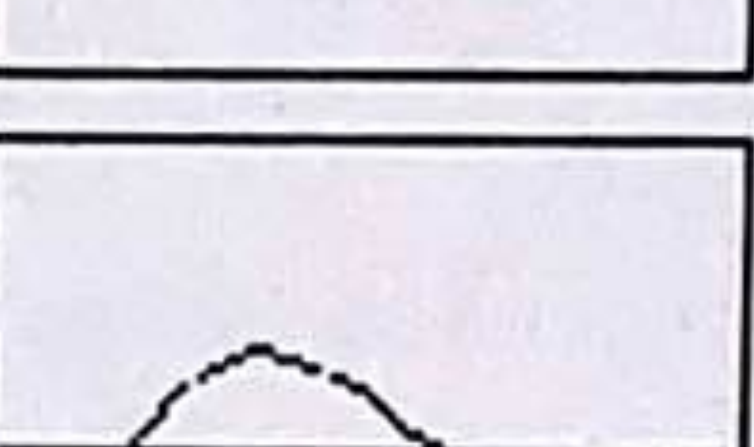
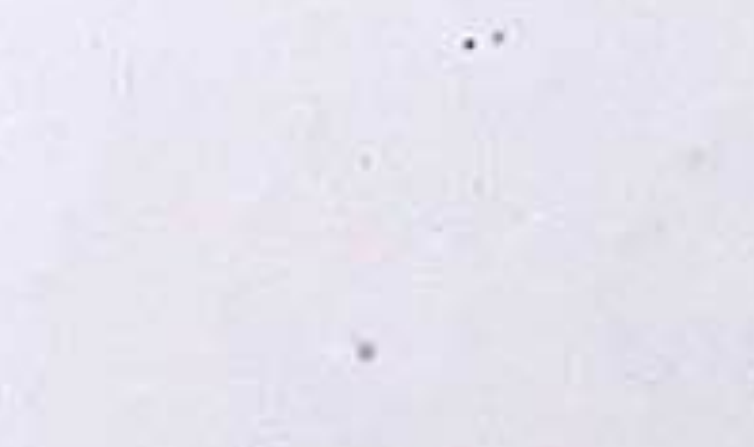

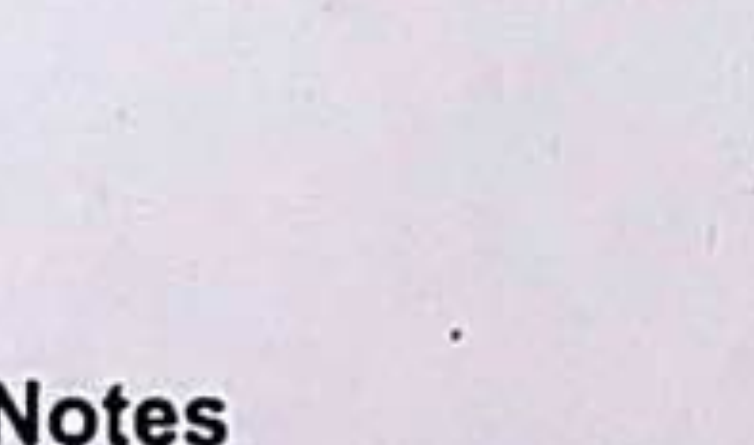

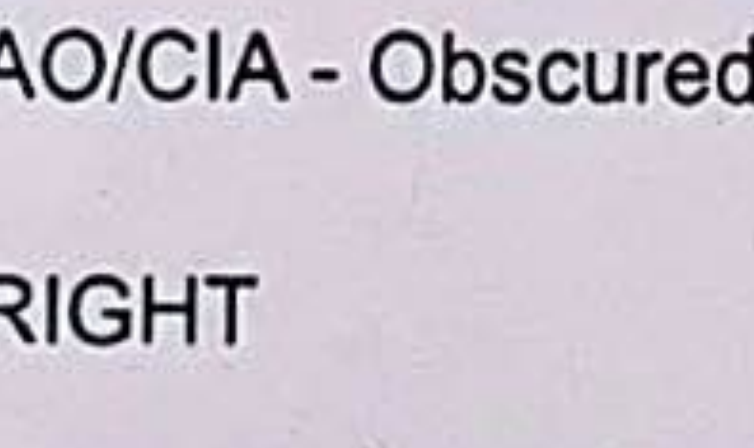

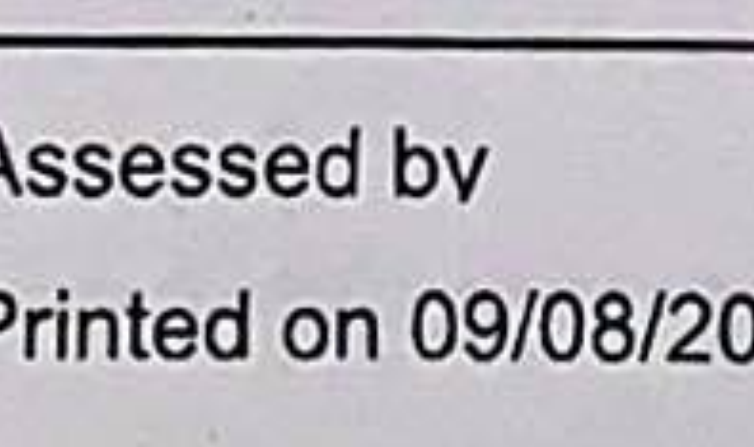
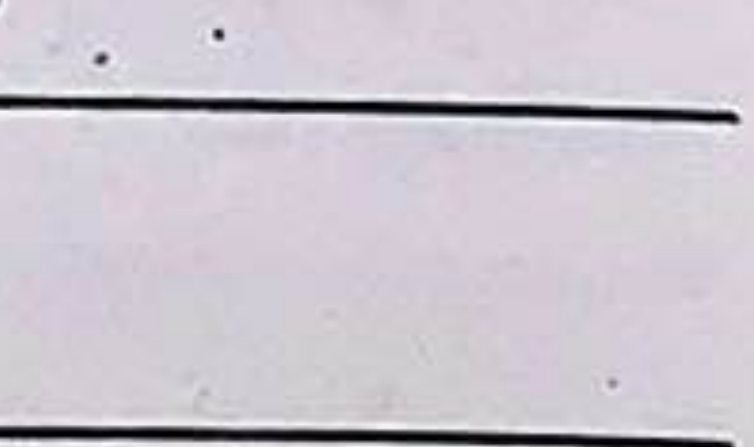
ATA: Patent, mild calcified disease with good triphasic waveforms at the ankle, PSV 83cm/s.

PTA: Patent, mild calcified disease with good triphasic waveforms at the ankle, PSV 59cm/s.

ABPIs: Unable to obtain due to weak/absent pulses at ankle.



Reason Routine
Outcome Stenosis severe, Obscured, Calcified, Diseased

Right	Left
<div>150 1.00</div> <div></div> <div>Turbulent</div>	<div>Brachial</div> <div></div>
<div></div> <div>Turbulent</div>	<div>Common Femoral</div> <div></div>
<div></div> <div>Reduced</div>	<div>High Thigh</div> <div></div>
<div></div> <div>Reduced</div>	<div>Low Thigh</div> <div></div>
<div></div> <div>Weak</div>	<div>Popliteal</div> <div></div>
<div></div> <div>Weak</div>	<div>High Calf</div> <div></div>
<div></div> <div>Weak</div>	<div>Peroneal</div> <div></div>
<div>96 0.64</div> <div></div> <div>Weak</div>	<div>Anterior Tibial</div> <div><div>100 0.67</div><div></div><div>Weak</div></div>
<div></div> <div>Reduced</div>	<div>Posterior Tibial</div> <div></div>
	<div>Dorsalis Pedis</div>
	<div>Toe Pressure</div>
	<div>Post Exercise</div>

Notes

BILATERAL LOWER LIMB ARTERIAL DUPLEX ASSESSMENT

AO/CIA - Obscured due to bowel gas.

RIGHT

EIA: Patent, mild calcified disease along length, good triphasic waveforms, PSV 189cm/s.

CFA: Patent, severe calcified disease in mid vessel measuring ~1.85cm, PSV 64cm/s to PSV 592cm/s,

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turbulent monophasic waveforms.

PFA: Patent, mod calcified disease at origin, slightly turbulent monophasic waveforms, PSV 196cm/s.

SFA: Patent, mod calcified disease proximally, turbulent monophasic waveforms, PSV 189cm/s. Mild/mod calcified stenosis in mid vessel (52cm from MM) measuring ~1.13cm, velocities increasing from PSV 43 - 100cm/s, slightly reduced monophasic waveforms. Patent distally with mod diffuse calcified disease, slightly turbulent waveforms, PSV 123-42cm/s. Patent through adductor canal.

POPA: Patent, mild calcified disease, reduced monophasic waveforms, PSV 45-24cm/s. TPT appears patent and calcified, 2 vessel run off noted.

ATA: Patent, heavily calcified walls along length, weak monophasic waveforms at the ankle, PSV 32cm/s.

PTA: Patent, heavily calcified walls along length, reduced monophasic waveforms at the ankle, PSV 50cm/s.

PerA: Patent, heavily calcified walls along length, weak monophasic waveforms at the ankle, PSV 28cm/s.

LEFT

EIA: Patent, mild calcified disease along length, good triphasic waveforms, PSV 99cm/s.

CFA: Patent, severe calcified disease along length, turbulent monophasic waveforms PSV 59 - 392cm/s.

PFA: Patent, mild/mod calcified disease at origin, slightly turbulent triphasic waveforms, PSV 96cm/s.

SFA: Proximal vessel very poorly visualised due to heavily calcified walls. Mid-distal vessel appears patent with mod diffuse calcified disease, reduced monophasic waveforms, PSV 59-43cm/s. Patent through adductor canal.

POPA: Patent, mild calcified disease, reduced monophasic waveforms, PSV 28cm/s. TPT appears patent and calcified, 2 vessel run off noted.

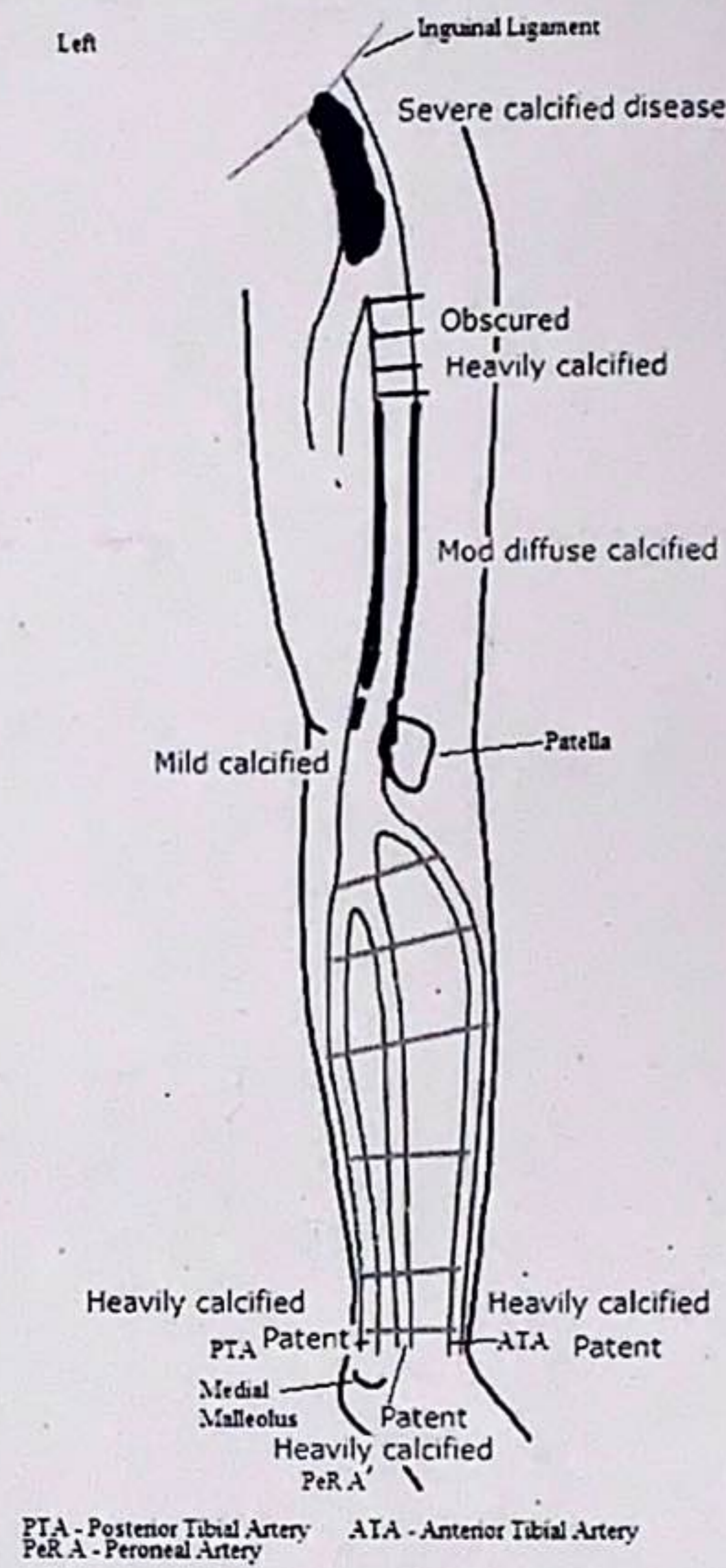
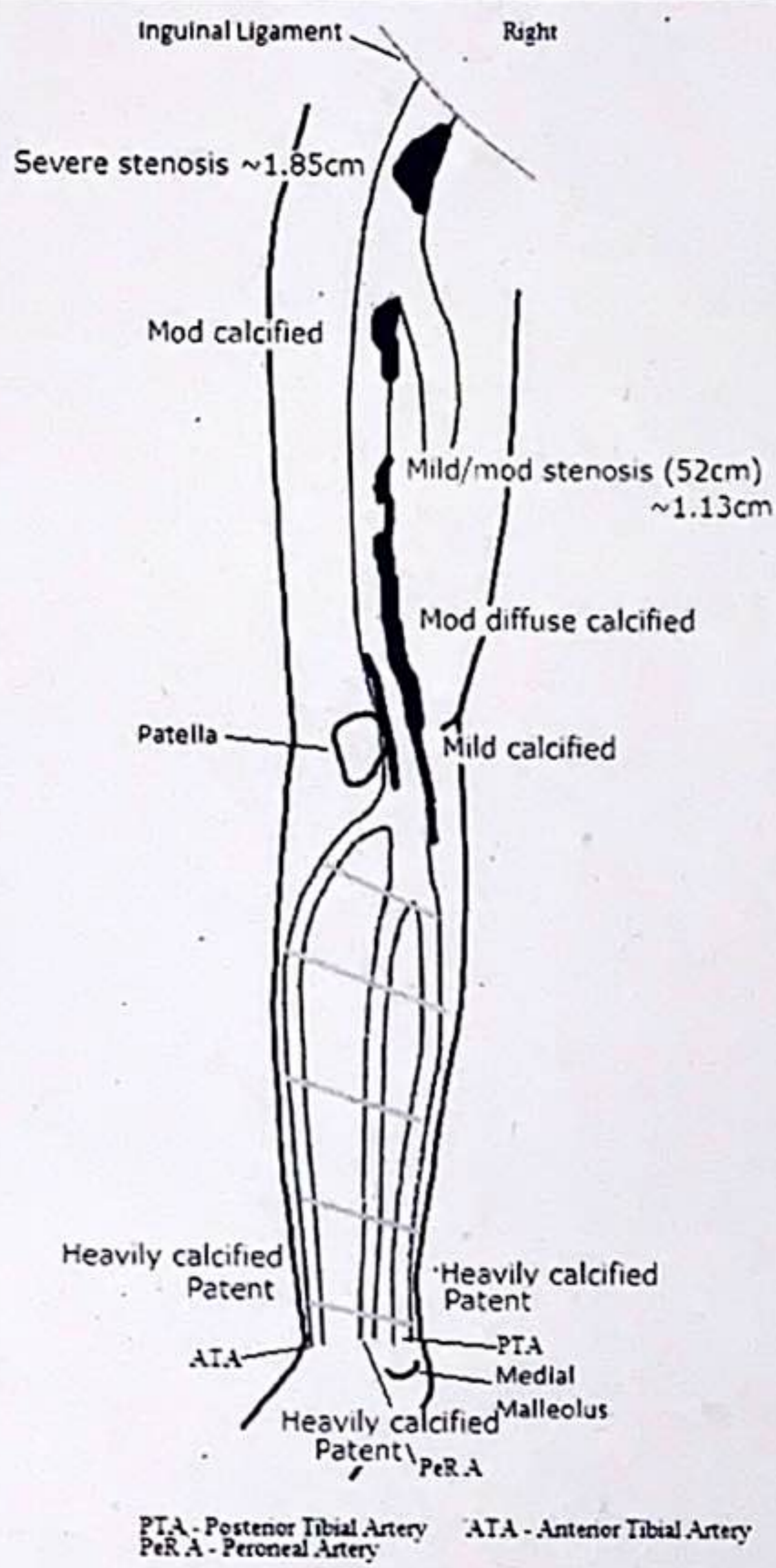
ATA: Patent, heavily calcified walls along length, weak monophasic waveforms at the ankle, PSV 40cm/s.

PTA: Patent, heavily calcified walls along length, weak monophasic waveforms at the ankle, PSV 17cm/s.

PerA: Patent, heavily calcified walls along length, weak monophasic waveforms at the ankle, PSV 35cm/s.

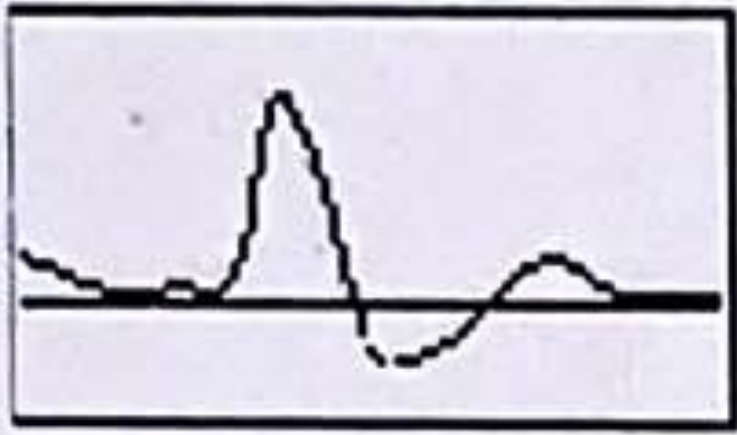
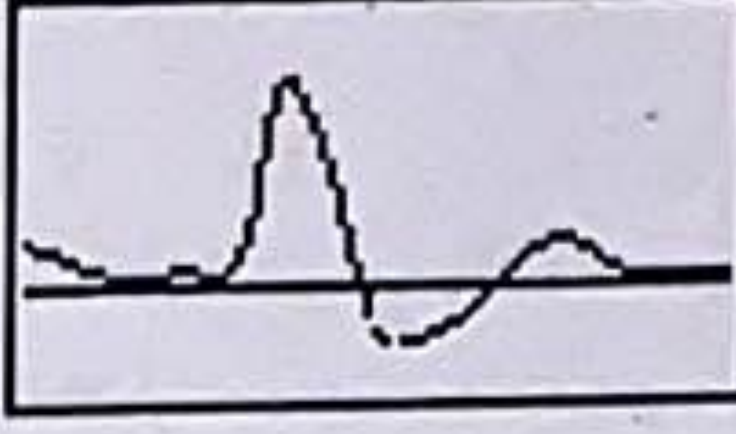

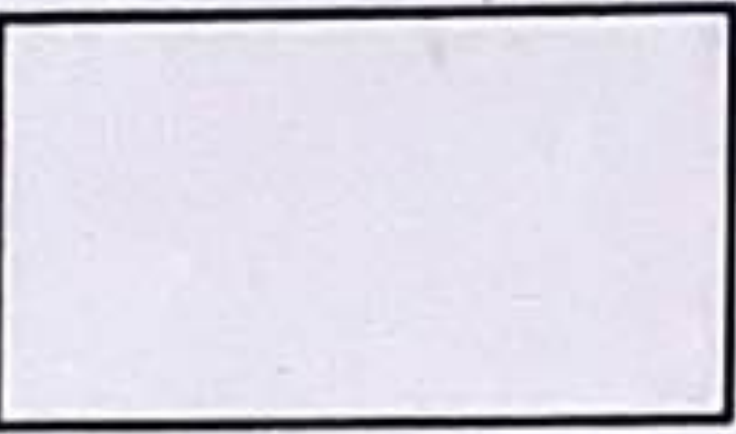

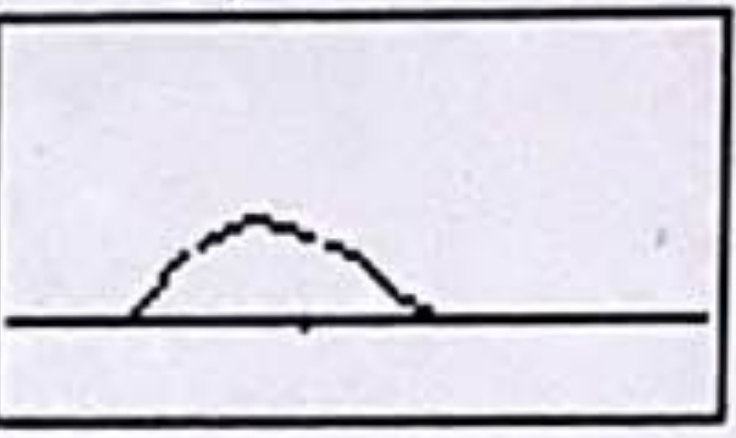
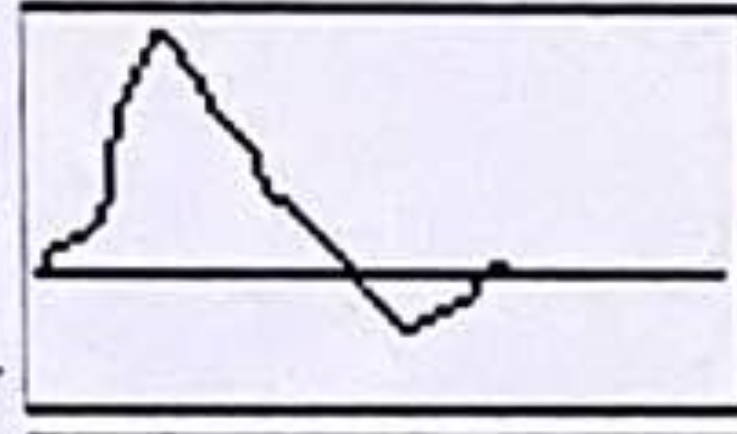

ABPIs

Right and left resting ABPIs are significantly reduced.





Reason Routine
Outcome Stenosis mild, Occlusion, Calcified

Right		Left
<div>130</div> <div>1.00</div> <div></div> <div>Good</div>	Brachial	
	Common Femoral	<div>Good</div> <div></div>
	High Thigh	
	Low Thigh	
	Popliteal	<div>Good</div> <div></div>
	High Calf	
	Peroneal	<div>Absent</div> <div></div>
<div></div> <div>Good</div>	Anterior Tibial	<div>Weak prox-mid</div> <div></div>
<div></div> <div>Good</div>	Posterior Tibial	<div>Good</div> <div></div>
	Dorsalis Pedis	
	Toe Pressure	
	Post Exercise	

Notes

LEFT LOWER LIMB ARTERIAL DUPLEX ASSESSMENT

CFA: Patent, mild calcified disease with good triphasic waveforms, PSV 81cm/s.

PFA: Patent, mild calcified disease with good triphasic waveforms, PSV 83cm/s.

SFA: Patent with mild/mod calcified stenosis proximal vessel measuring ~1.32cm (~64cm from MM) with velocities increasing from PSV 90cm/s to PSV 229cm/s, falling to PSV 150cm/s. Mid - distal vessel appears patent with heavily calcified walls and mild/mod diffuse calcified disease, good monophasic waveforms, PSV 107cm/s. Patent through adductor canal.

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POPA: Patent, mild calcified disease with good triphasic/bouncy monophasic waveforms, PSV 67-77cm/s.

TPT patent with 2 vessel run off noted.

ATA: Patent with heavily calcified walls along length, good bouncy monophasic waveforms at the ankle, PSV 128cm/s.

PTA: Poorly visualised due to heavily calcified walls, vessel appears patent prox-mid with weak monophasic waveforms, PSV 24cm/s. No flow identified distally ?occluded at the ankle.

PerA: Not identified ?patency.

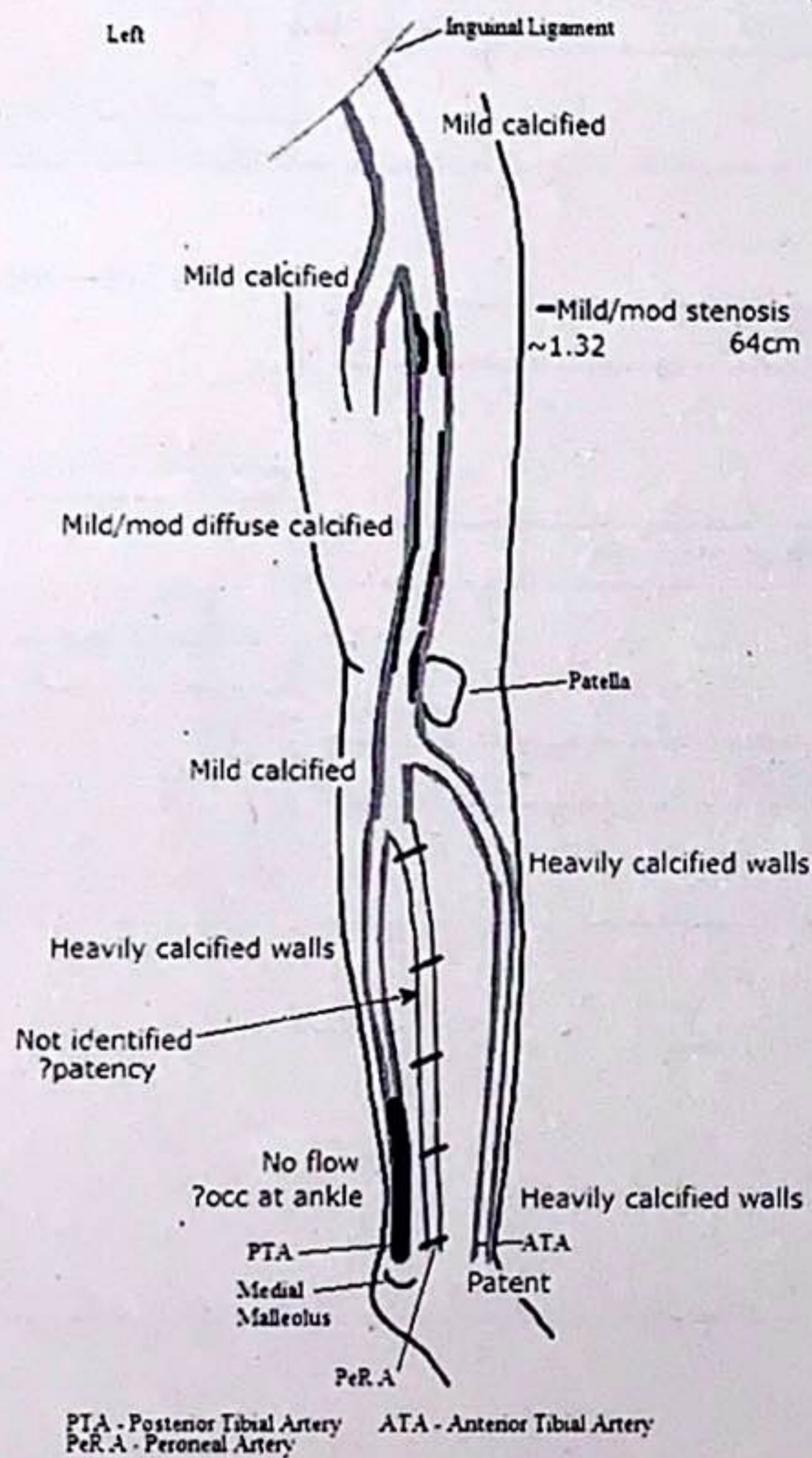
RIGHT

CFA: Patent, mild calcified disease with good triphasic waveforms, PSV 67cm/s.

ATA: Patent, heavily calcified walls with good biphasic waveforms at the ankle, PSV 71cm/s.

PTA: Patent, heavily calcified walls with good biphasic waveforms at the ankle, PSV 59cm/s.

ABPIs: Unable to obtain as calf vessels incompressible at 220mmHg bilaterally.





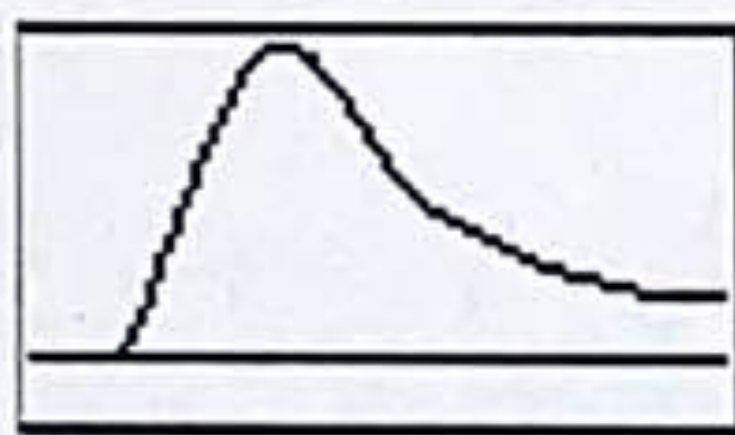
Reason Routine
Outcome disease moderate, disease severe, Calcified, Stenosis Severe, Significant disease indicated

Right

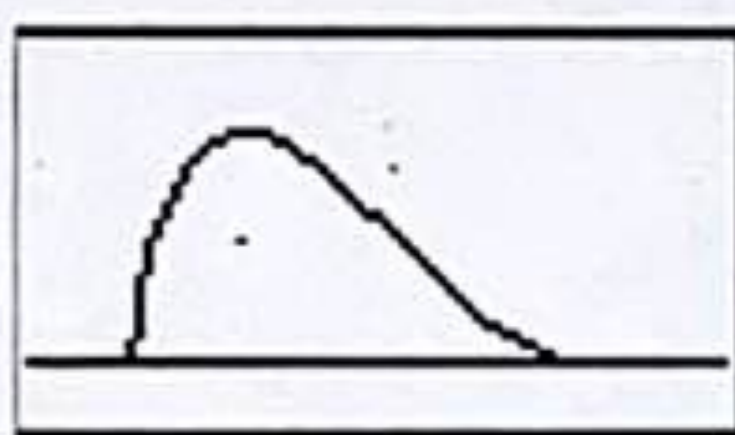
220 1.00



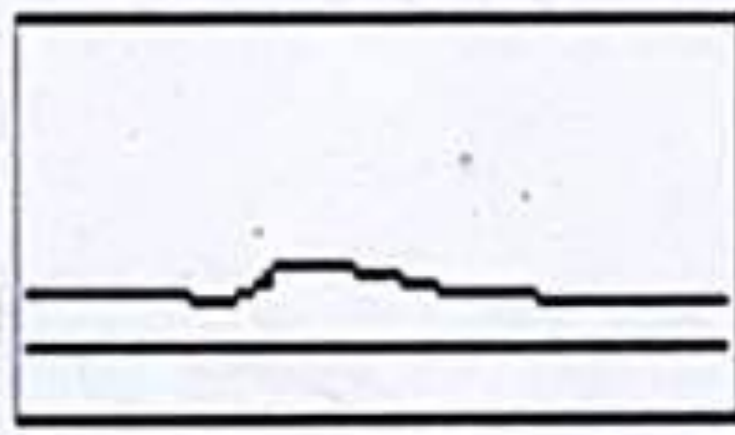
Good



Slightly Reduced



Reduced



Weak

110

0.50

Brachial

Common Femoral

High Thigh

Low Thigh

Popliteal

High Calf

Peroneal

Anterior Tibial

Posterior Tibial

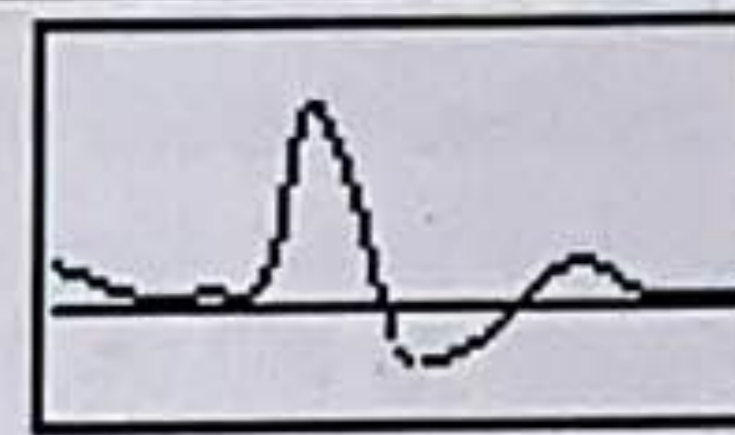
Dorsalis Pedis

Toe Pressure

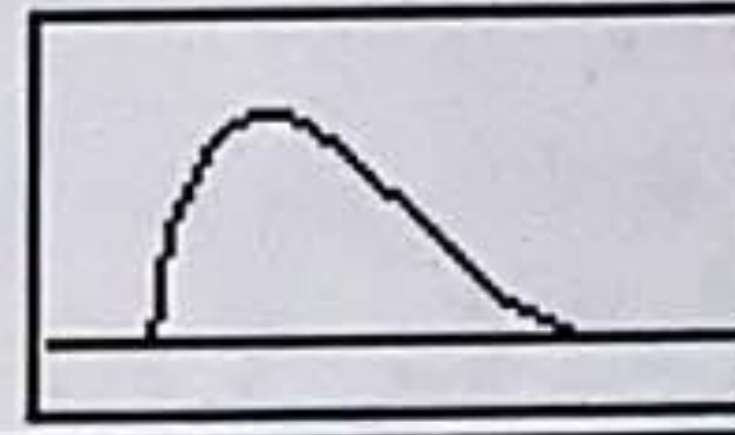
Post Exercise

Left

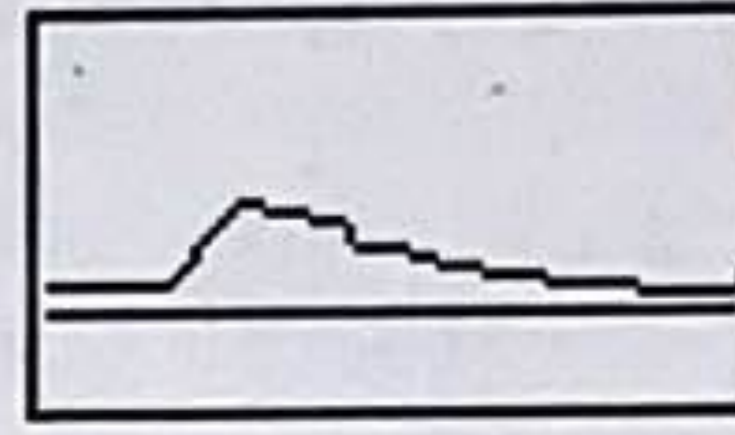
Good



Reduced



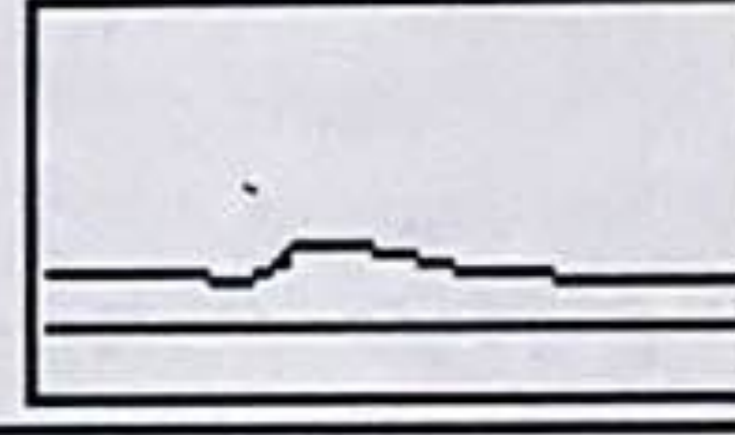
Reduced



Weak

110

0.50



Notes

BILATERAL LOWER LIMB ARTERIAL DUPLEX SCAN

AORTA: Obscured due to bowel gas.

RIGHT:

CIA: Vessel appears patent proximally with mild calcified disease, good triphasic waveforms, PSV 114cm/s.
Distal vessel obscured by bowel gas.

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EIA: Proximal vessel obscured by bowel gas. Distal vessel appears patent with slightly raised triphasic waveforms, PSV 265cm/s, mild calcified disease ?due to tortuous vessel/?significant prox disease.

CFA: Patent, mild calcified disease with good triphasic waveforms, PSV 81cm/s.

PFA: Patent, mild disease good triphasic waveforms, PSV 130cm/s.

SFA: Severe stenosis noted proximally measuring ~0.95cm (59cm from MM) velocities increasing from PSV 81cm/s, to 450cm/s, turbulent monophasic waveforms, falling to PSV 69cm/s distally. Mod diffuse calcified disease in mid vessel with heavily calcified walls, reduced monophasic waveforms, PSV 177-56cm/s. Mid-distal vessel obscured for ~1cm by heavily calcified disease and acoustic shadowing ?patency (50 cm from MM). Distal vessel appears patent with mild/mod calcified disease, reduced monophasic waveforms, PSV 56cm/s. Patent through adductor canal.

POPA: Patent, mild calcified disease along length with slightly reduced monophasic waveforms, PSV 56-71cm/s. TPT patent, 2 vessel run off noted.

ATA: Patent with heavily calcified walls along length, reduced monophasic waveforms at the ankle, PSV 60cm/s.

PTA: Patent with heavily calcified walls along length, weak monophasic waveforms at the ankle, PSV 16cm/s.

PerA: Not identified.

LEFT:

CIA: Vessel appears patent proximally with mild calcified disease, good triphasic waveforms, PSV 78cm/s. Distal vessel obscured by bowel gas.

EIA: Proximal vessel obscured by bowel gas. Distal vessel appears patent with good biphasic waveforms, PSV 163cm/s, mild calcified disease.

CFA: Patent, mild/mod calcified disease with good triphasic waveforms, PSV 118cm/s.

PFA: Patent, mild calcified disease with good biphasic waveforms, PSV 122cm/s.

SFA: Patent with mod calcified stenosis proximally measuring ~1cm (66cm from MM) with velocities increasing from PSV 68cm/s to PSV 165cm/s, turbulent monophasic waveforms. Mild/mod diffuse calcified disease in the mid vessel with turbulent monophasic waveforms, PSV 92cm/s. The distal vessel is obscured by heavy calcification with no flow identified at 53cm from MM ?short occlusion. Flow appears to reform in the distal vessel (51cm from MM) with turbulent monophasic waveforms PSV 163cm/s, mild/mod calcified disease.

POPA: Patent with mild calcified disease along length, reduced monophasic waveforms, PSV 50-42cm/s.

TPT appears patent, 2 vessel run off noted.

ATA: Patent with heavily calcified walls along length, reduced monophasic waveforms at the ankle, PSV 32cm/s.

PTA: Patent with heavily calcified walls along length, weak monophasic waveforms at the ankle, PSV 17cm/s.

PerA: Not identified.

ABPI: Right and left resting ABPIs are significantly reduced, ?accuracy due to high brachial pressure and calcified calf vessels bilaterally.

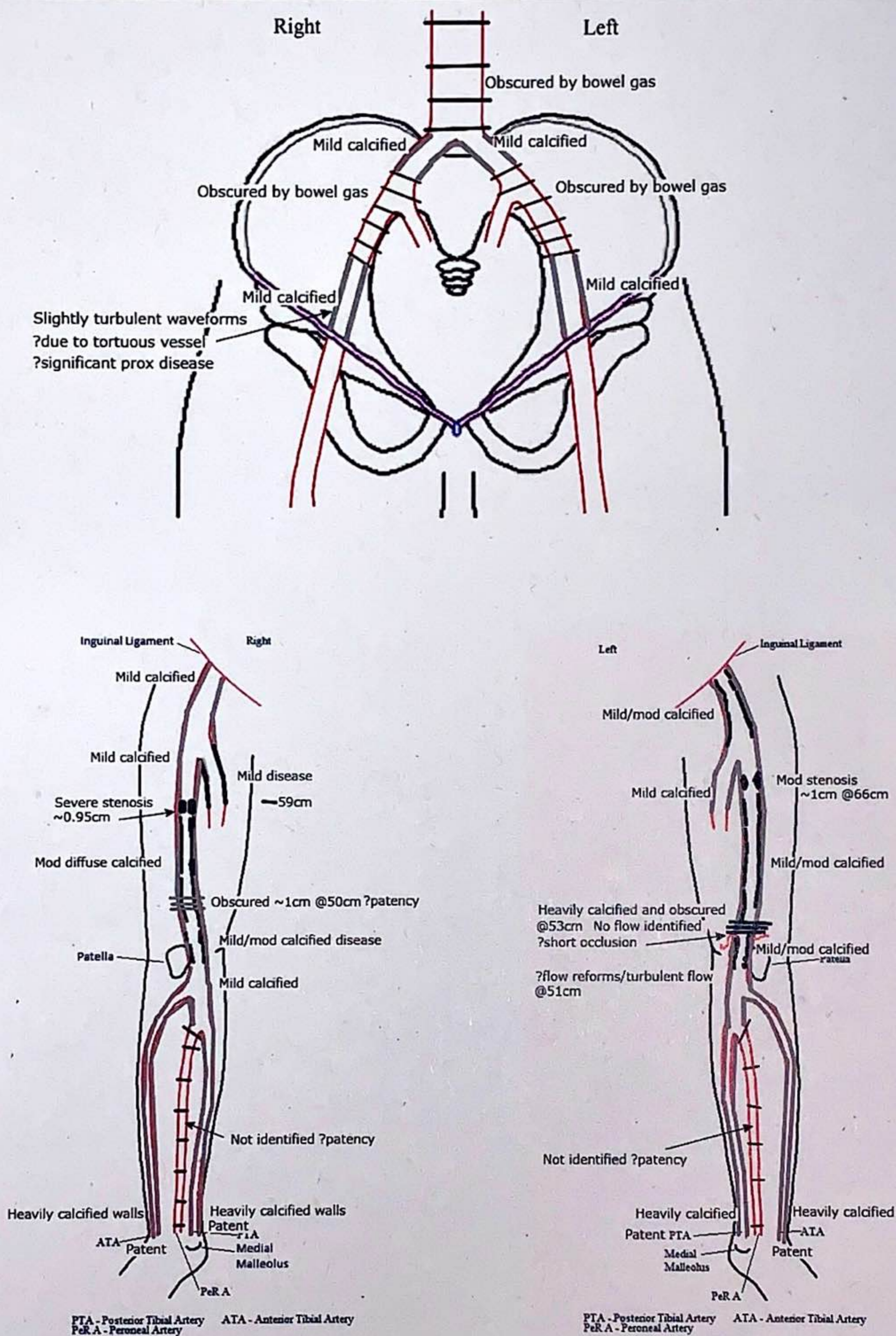
Conclusion: Evidence of significant right and left lower limb arterial disease.

SUGGEST VASCULAR SURGICAL OPINION.

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Reason Routine
Outcome Graft occlusion

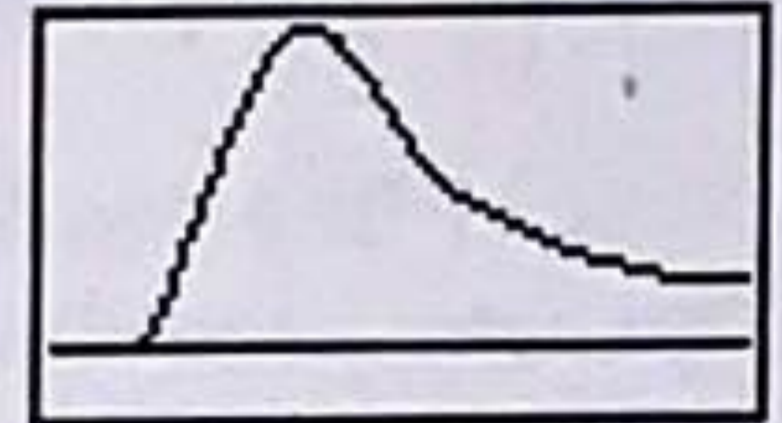
Right

Left

Brachial

Common Femoral

Good/Turbulent

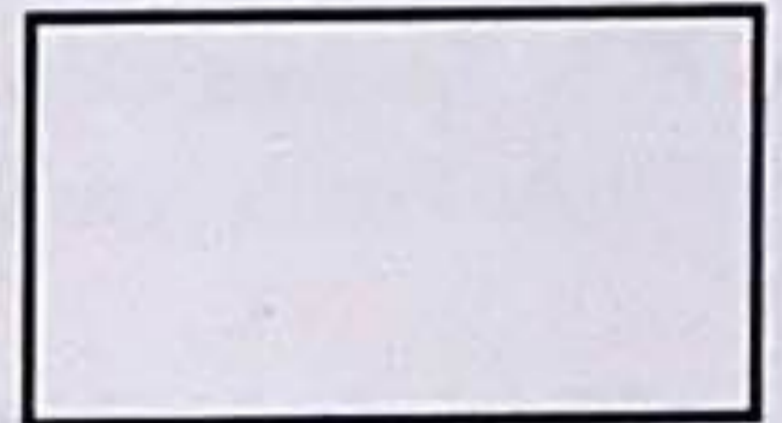


High Thigh

Low Thigh

Popliteal

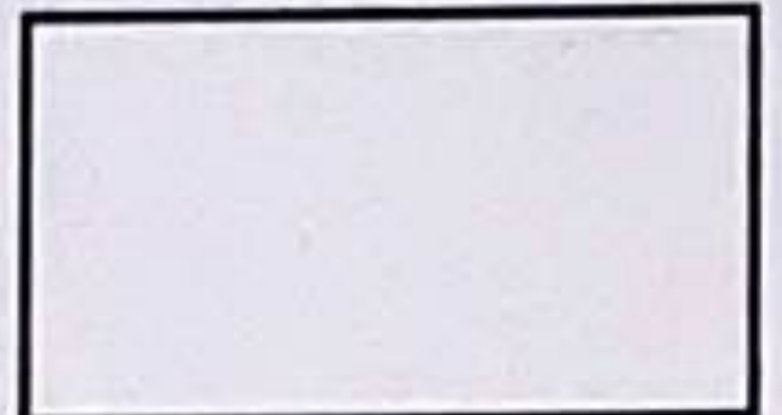
Absent



High Calf

Peroneal

Not Identified



Anterior Tibial

Absent



Posterior Tibial

Absent



Dorsalis Pedis

Toe Pressure

Post Exercise

Notes

LEFT LOWER LIMB FEMORO-POPLITEAL BYPASS ASSESSMENT

EIA: Patent, heavily calcified walls along length with good triphasic waveforms PSV 75-93cm/s.

CFA: Patent, mod calcified disease with good/turbulent monophasic waveforms, PSV 274cm/s.

PFA: Patent, mod calcified disease with turbulent monophasic waveforms, PSV 167cm/s.

SFA: Appears chronically occluded along length.

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FEM-POP BYPASS GRAFT:

PROX ANAST: Appears acutely occluded with echolucent material ?thrombus.

PROX GRAFT: Appears acutely occluded with echolucent material ?thrombus.

MAIN BODY: Appears acutely occluded with echolucent material ?thrombus.

DISTAL GRAFT: Appears acutely occluded with echolucent material ?thrombus.

DISTAL ANAST: Appears acutely occluded with echolucent material ?thrombus.

Distal POPA: No flow identified, vessel appears moderately calcified and acutely occluded with echolucent material ?thrombus ?acute on chronic occlusion.

TPT: Poorly visualised due to calcification and depth ?occluded.

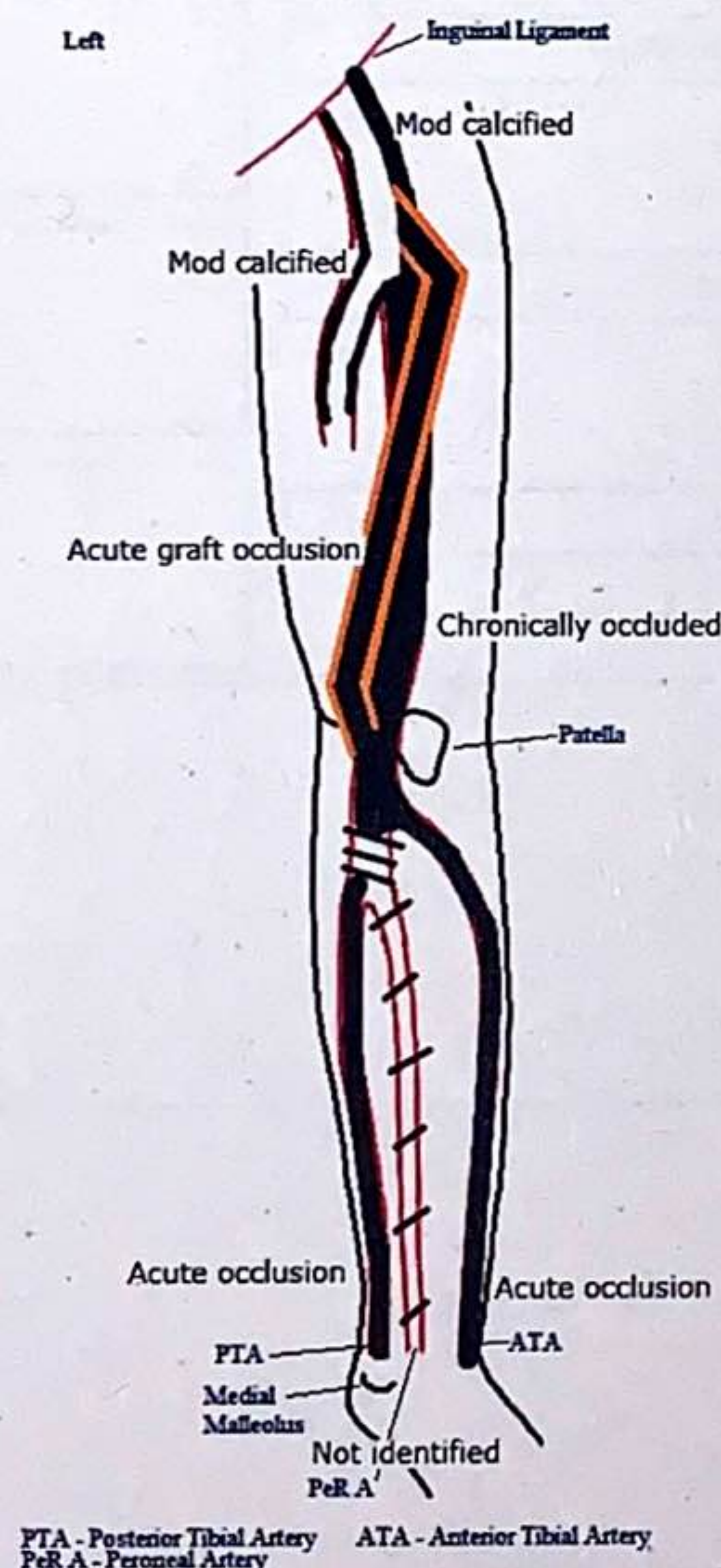
ATA: No flow identified along length, vessel appears acutely occluded with echolucent material ?thrombus.

PTA: No flow identified along length, vessel appears acutely occluded with echolucent material ?thrombus.

PerA: Poorly visualised due to depth.

ABPIs: Unable to obtain as calf vessels appear occluded at ankle.

CONCLUSION: Evidence of left lower limb critical limb ischaemia.

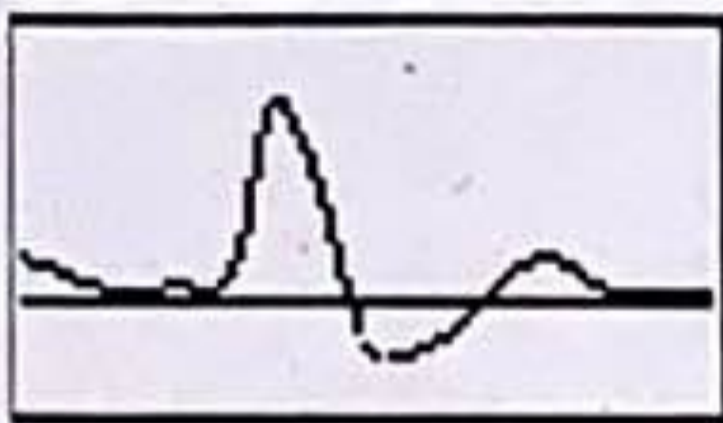




Reason Graft synthetic cross over
Outcome disease mild, Widely patent

Right

Left

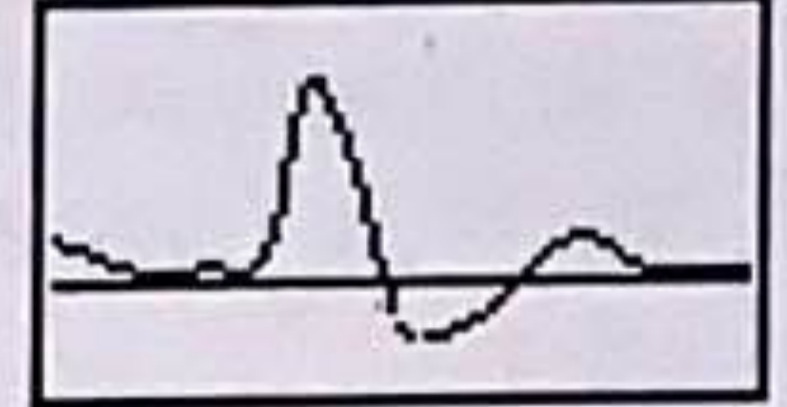


Good

Brachial

Common Femoral

Good



High Thigh

Low Thigh

Popliteal

High Calf

Peroneal

Anterior Tibial

Posterior Tibial

Dorsalis Pedis

Toe Pressure

Post Exercise

Notes

FEM-FEM XOVER GRAFT SURVEILLANCE

PROX ANAST: Widely patent with slightly turbulent biphasic waveforms, PSV 78cm/s.

PROX GRAFT: Widely patent with good triphasic waveforms, PSV 54cm/s.

MAIN GRAFT BODY: Widely patent with good triphasic waveforms, PSV 54cm/s.

DISTAL GRAFT: Widely patent with good triphasic waveforms, PSV 55cm/s.

DISTAL ANAST: Widely patent with slightly turbulent triphasic waveforms, PSV 111cm/s.

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RIGHT

CFA: Patent with mild disease, good triphasic waveforms, PSV 142cm/s.

PFA: Patent with mild disease, good triphasic waveforms, PSV 51cm/s.

Prox SFA: Patent with mild disease, good triphasic waveforms, PSV 62cm/s.

LEFT

CFA: Patent with mild disease, weak oscillatory flow proximal to distal anastomosis, PSV 19cm/s.

PFA: Patent with mild disease, good biphasic waveforms, PSV 75cm/s.

Prox SFA: Patent with mild disease, good triphasic waveforms, PSV 80cm/s.

Reason Claudication, Routine

Outcome Occlusion, Thrombus

Right

110

1.00

Distal occlusion

Slightly Reduced

Slightly Reduced

86

0.78

Slightly Reduced

Brachial

Common Femoral

High Thigh

Low Thigh

Popliteal

High Calf

Peroneal

Anterior Tibial

Posterior Tibial

Dorsalis Pedis

Toe Pressure

Post Exercise

Left

Good

Good

Good

120

1.09

Notes

RIGHT LOWER LIMB ARTERIAL DUPLEX SCAN

AORTA: Normal and uniform calibre with maximum inner-inner AP dimensions: TS plane - 1.8cm. Vessel appears patent with good triphasic waveforms, PSV 84cm/s.

CIA/EIA: Widely patent along length, good triphasic waveforms, PSV 101-116cm/s.

CFA: Patent proximally mild disease, slightly reduced monophasic waveforms, PSV 117cm/s. Mid-distal

Assessed by David Barrett

Printed on 05/08/2022 at 4:32 pm

Checked by

vessel appears occluded for ~2.4cm, with echolucent material ?soft plaque ?thrombus. Well developed multiple collaterals noted at level of occlusion.

PFA: Patent with retrograde flow filling SFA.

SFA: Patent with mild disease along length, slightly reduced monophasic waveforms, PSV 84-69cm/s.

POPA: Patent with mild disease along length, slightly reduced monophasic waveforms, PSV 56-40cm/s.

TPT: Patent, 3 vessel run off.

ATA: Patent, mild disease along length, slightly reduced monophasic waveforms at the ankle, PSV 89cm/s.

PTA: Patent, mild disease along length, slightly reduced monophasic waveforms at the ankle, PSV 75cm/s.

PerA: Poor views.

LEFT

CFA: Patent, mild disease with good triphasic waveforms, PSV 149cm/s.

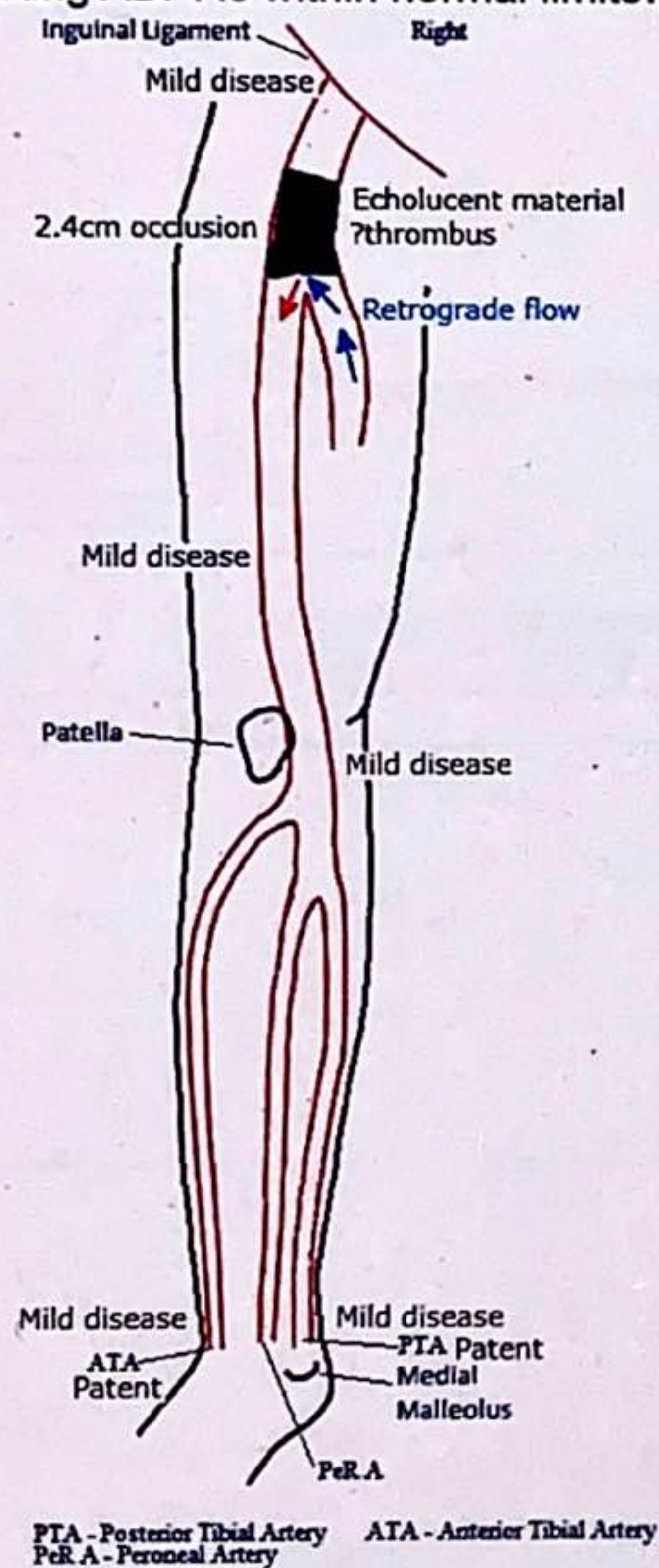
ATA: Patent at ankle with good bouncy/hypereamic monophasic waveforms, PSV 117cm/s.

PTA: Patent at ankle with good bouncy/hypereamic monophasic waveforms, PSV 230cm/s.

ABPI:

Right resting ABPI is slightly reduced.

Left resting ABPI is within normal limits.



Reason

Routine

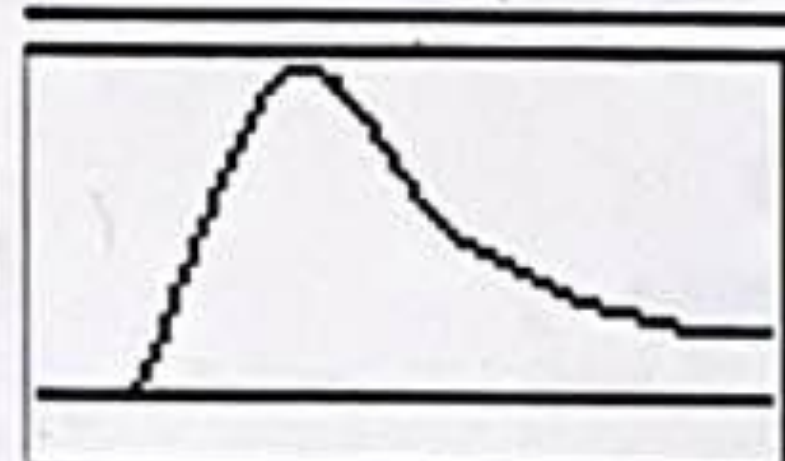
Outcome

disease severe, Occlusion, Obscured, Calcified, Stenosis Moderate, Stenosis Severe

Right

150

1.00



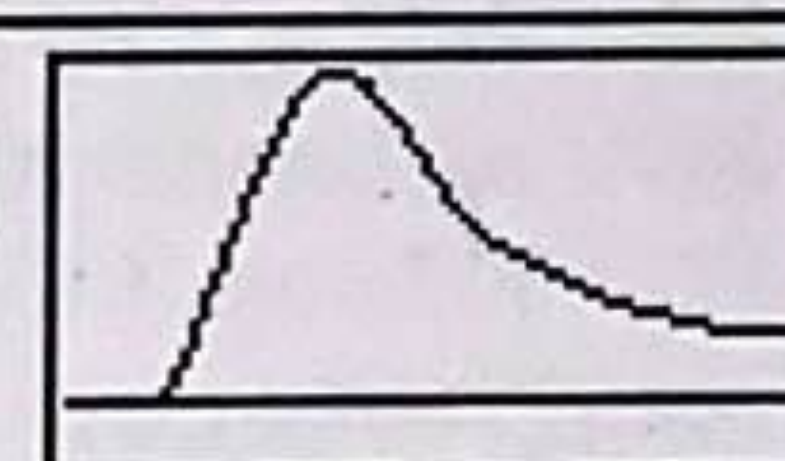
Good/Turbulent

Brachial

Common Femoral

Good

Left



High Thigh

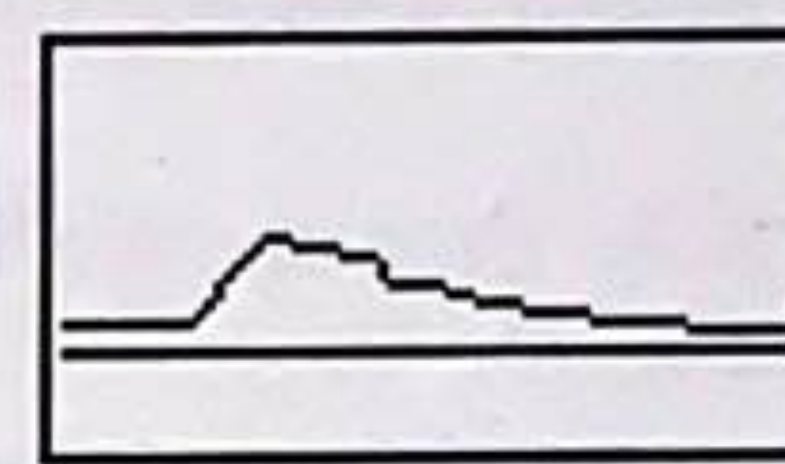
Low Thigh

Popliteal

Reduced



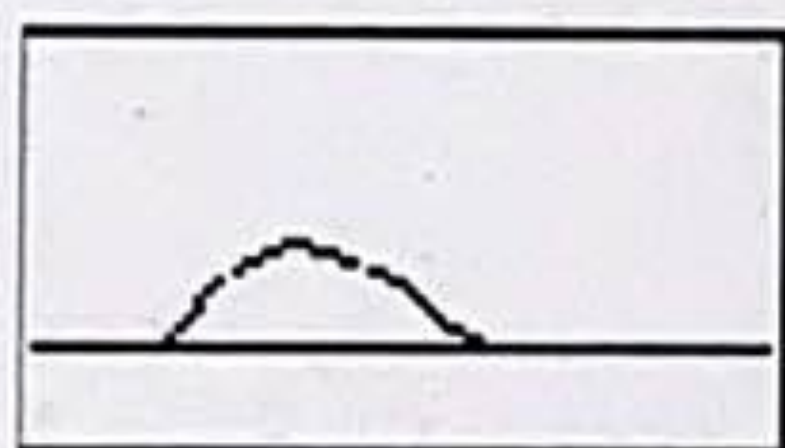
Reduced



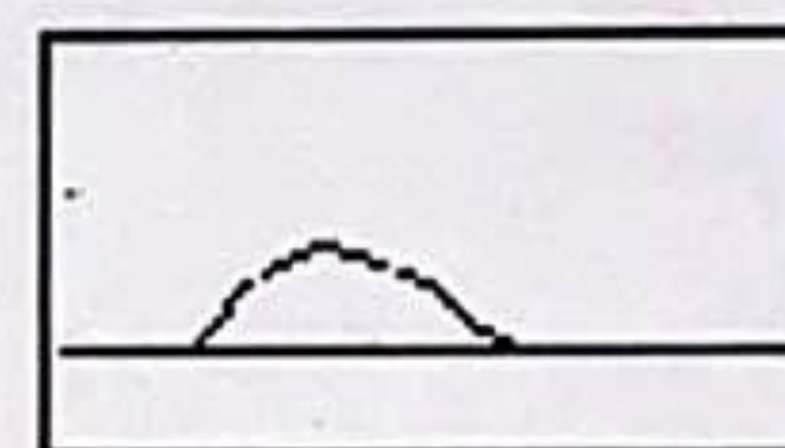
High Calf

Peroneal

Weak

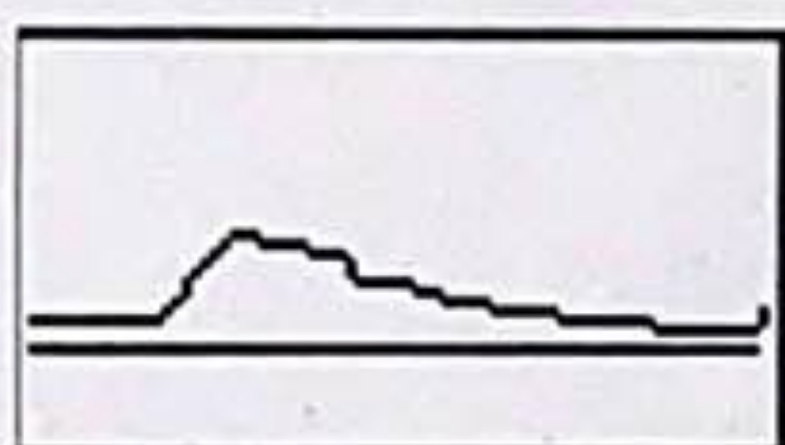


Weak



Anterior Tibial

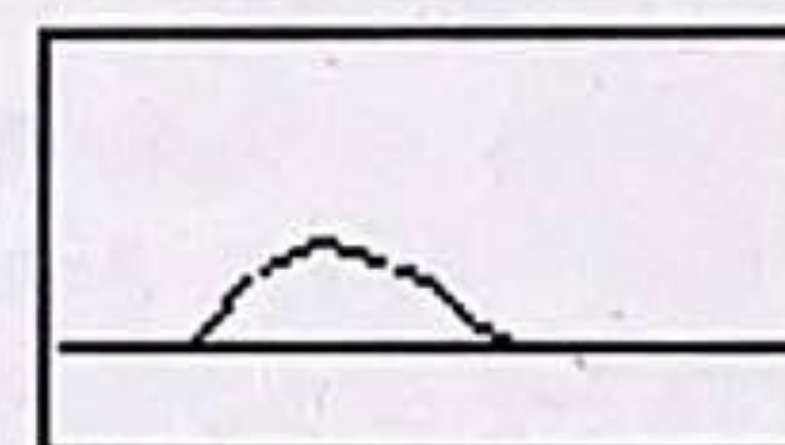
Weak



Reduced

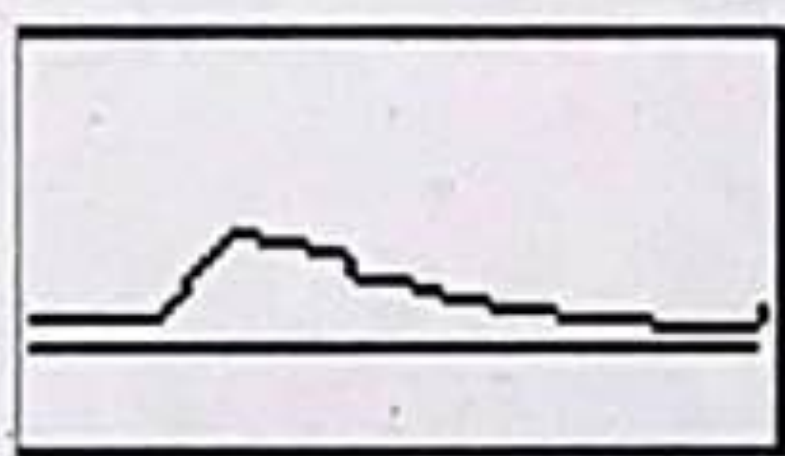
84

0.56



Posterior Tibial

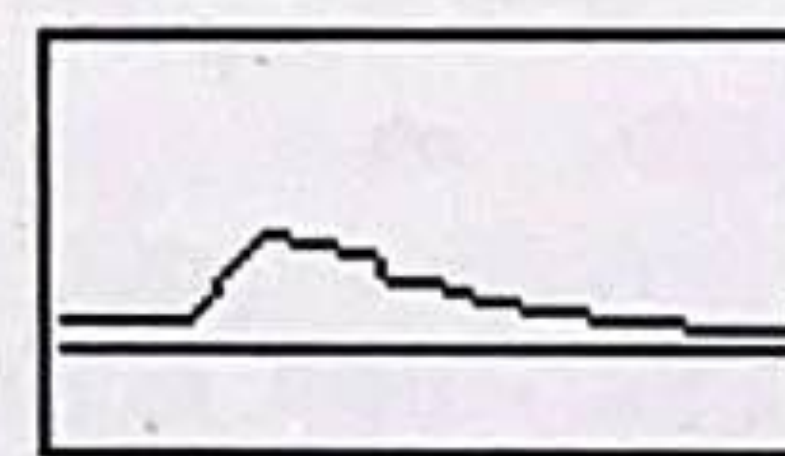
Reduced



Reduced

70

0.47



Dorsalis Pedis

Toe Pressure

Post Exercise

Notes

BILATERAL LOWER LIMB ARTERIAL DUPLEX SCAN

AORTA: Patent, calcified vessel walls, good triphasic waveforms, PSV 44cm/s.

RIGHT:

CIA: Moderate calcified stenosis noted proximally measuring ~1.39cm, turbulent monophasic waveforms, PSV 238cm/s. Distal vessel was poorly visualised due to bowel gas.

Assessed by

David Barrett

Printed on 05/08/2022 at 4:31 pm

Checked by

EIA: Proximal vessel was poorly visualised due to heavy calcification, where seen severe calcified disease with turbulent monophasic waveforms, PSV 563cm/s. Mid vessel poorly visualised due to bowel gas. Distal vessel appears patent with mild/mod calcified disease, slightly turbulent monophasic waveforms, PSV 277-176cm/s.

CFA: Patent, mild/mod calcified disease with turbulent monophasic waveforms, PSV 198cm/s.

PFA: Patent, mod calcified disease at origin with turbulent monophasic waveforms, PSV 302cm/s.

SFA: Severe calcified stenosis noted proximally measuring ~1.31cm, turbulent monophasic waveforms, PSV 367cm/s, falling to PSV 74cm/s, reduced monophasic waveforms. Mild/mod diffuse calcified disease noted in mid-distal vessel, reduced monophasic waveforms, PSV 50-52cm/s. Patent through adductor canal.

POPA: Patent, mild calcified disease along length, reduced monophasic waveforms, PSV 49-60cm/s. TPT patent, 3 vessel run off.

ATA: Patent, calcified vessel walls along its length, reduced monophasic waveforms at the ankle, PSV 40cm/s.

PTA: Patent, calcified vessel walls along its length, reduced monophasic waveforms at the ankle, PSV 53cm/s.

PerA: Patent, calcified vessel walls along its length, weak monophasic waveforms at the ankle, PSV 24cm/s.

LEFT:

CIA: No flow identified along length ?occluded.

EIA: Proximal vessel poorly visualised due to bowel gas. Mid vessel appears occluded with flow reforming distally via multiple collateral branches, slightly reduced monophasic waveforms, PSV 161cm/s.

CFA: Patent, mild calcified disease with slightly reduced monophasic waveforms, PSV 85cm/s.

PFA: Patent, mild calcified disease with slightly reduced triphasic waveforms, PSV 27cm/s.

SFA: Patent, mild calcified disease along its length, slightly reduced monophasic waveforms, PSV 83-53cm/s. Patent through adductor canal.

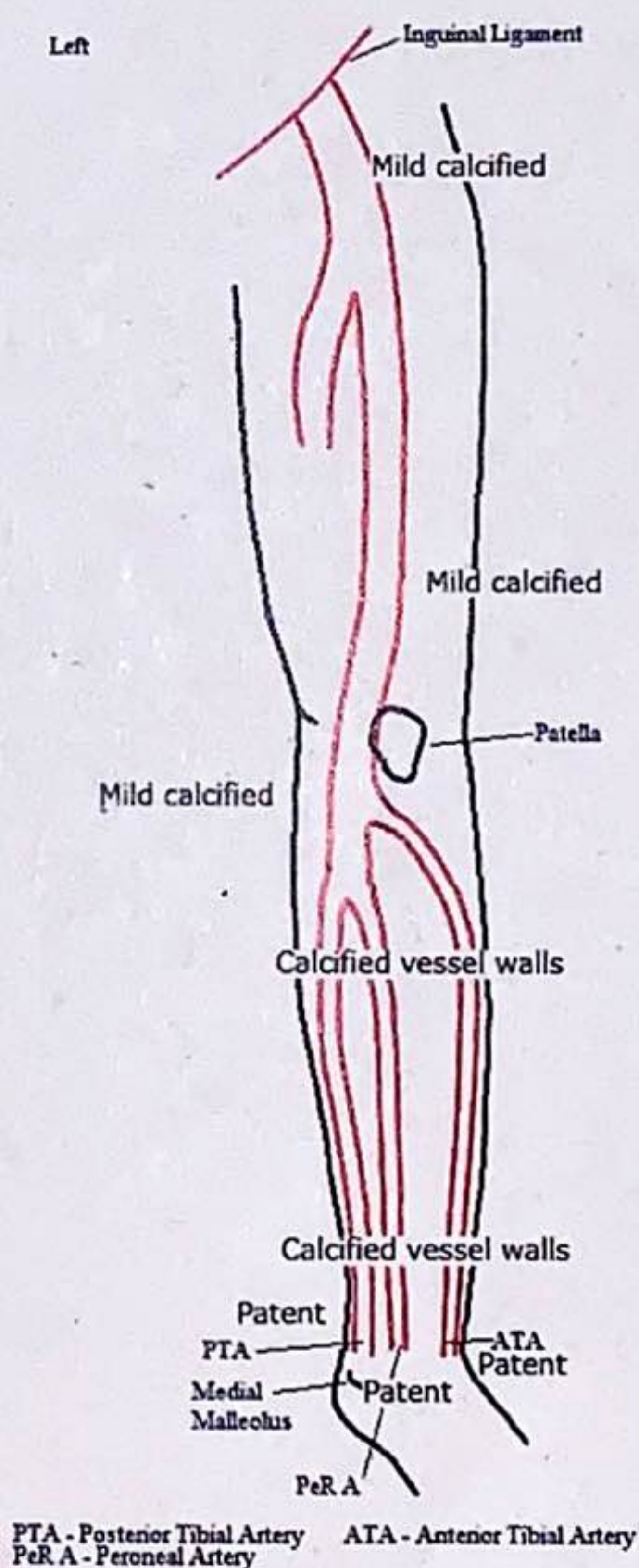
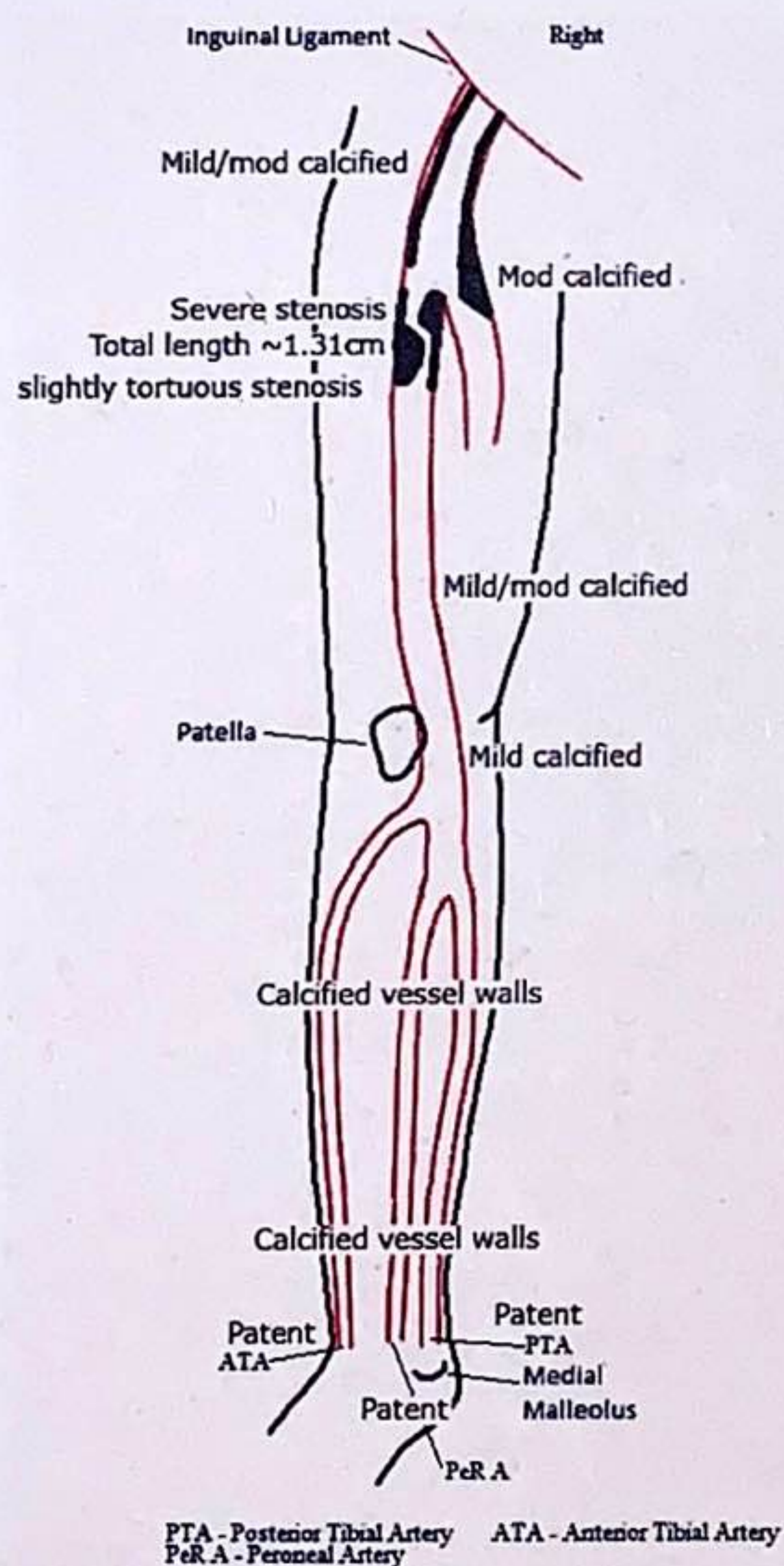
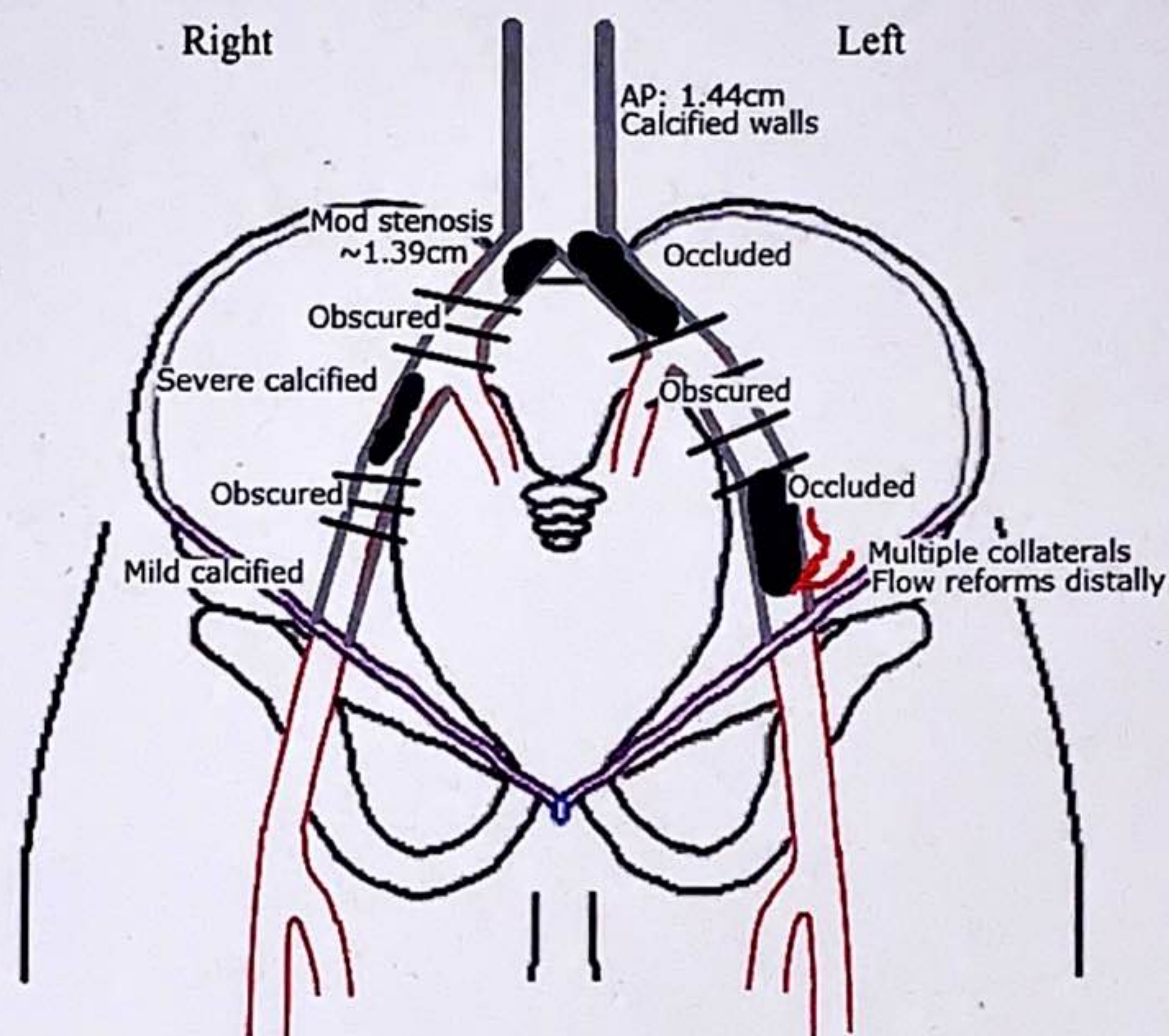
POPA: Patent, mild calcified disease along its length, reduced monophasic waveforms, PSV 48-45cm/s. TPT patent, 3 vessel run off.

ATA: Patent, calcified vessel walls along its length, weak monophasic waveforms at the ankle, PSV 16cm/s.

PTA: Patent, calcified vessel walls along its length, reduced monophasic waveforms at the ankle, PSV 46cm/s.

PerA: Patent, calcified vessel walls along its length, weak monophasic waveforms at the ankle, PSV 17cm/s.

ABPI: Right and left resting ABPIs are significantly reduced.

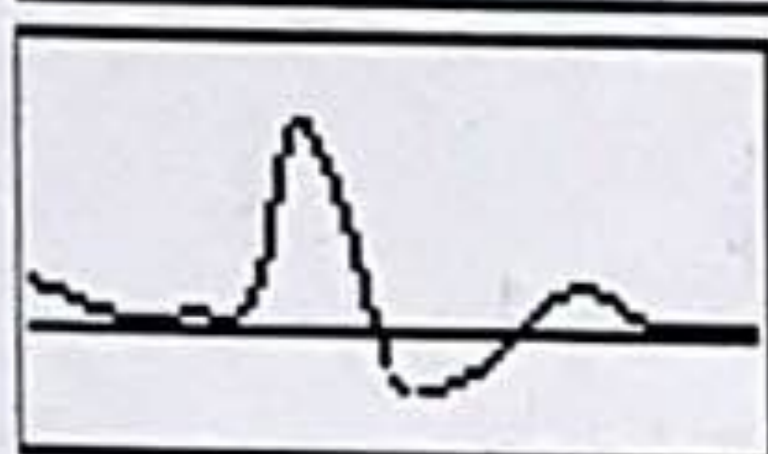


Reason Popliteal entrapment
Outcome Widely patent, Popliteal entrapment +

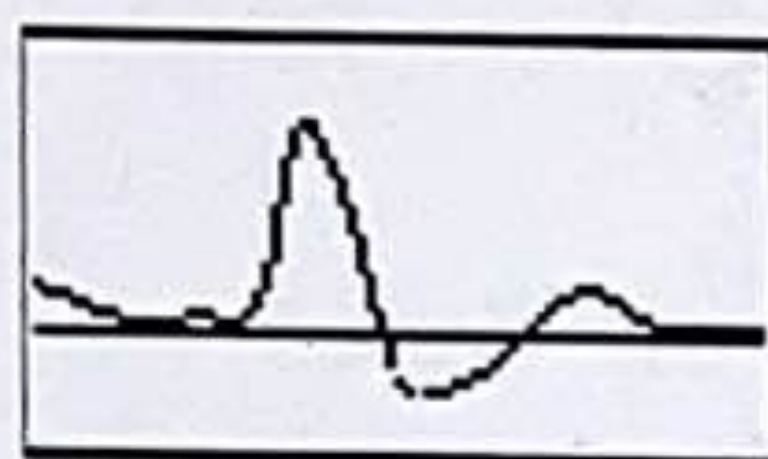
Right

124

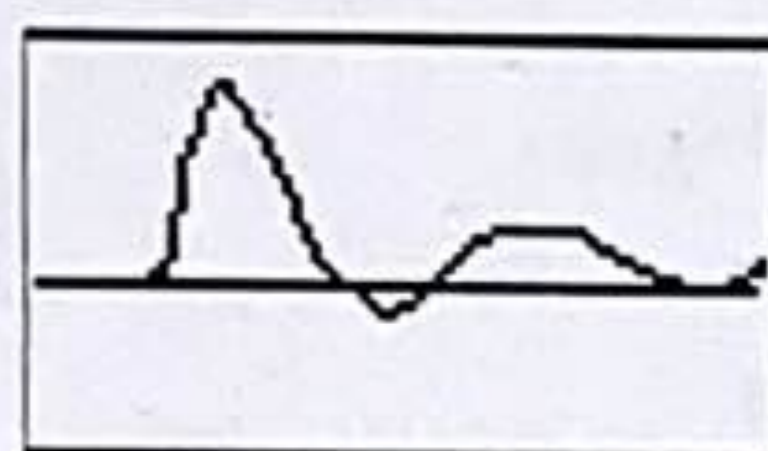
1.00



Good



Good



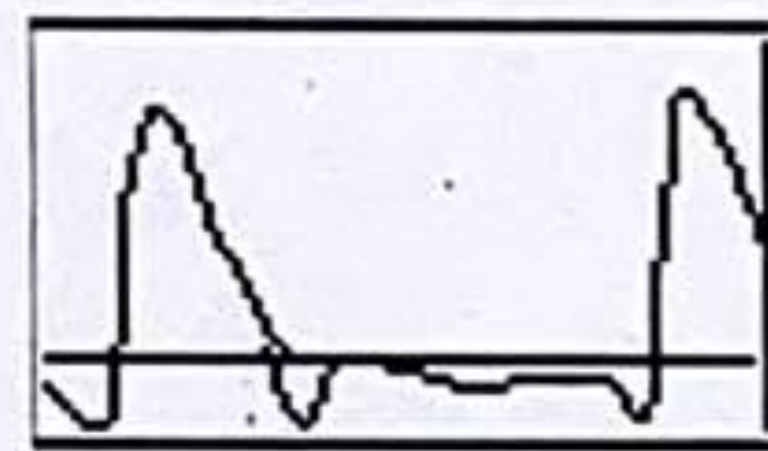
Good



Good

130

1.05



Good

Brachial

Common Femoral

High Thigh

Low Thigh

Popliteal

High Calf

Peroneal

Anterior Tibial

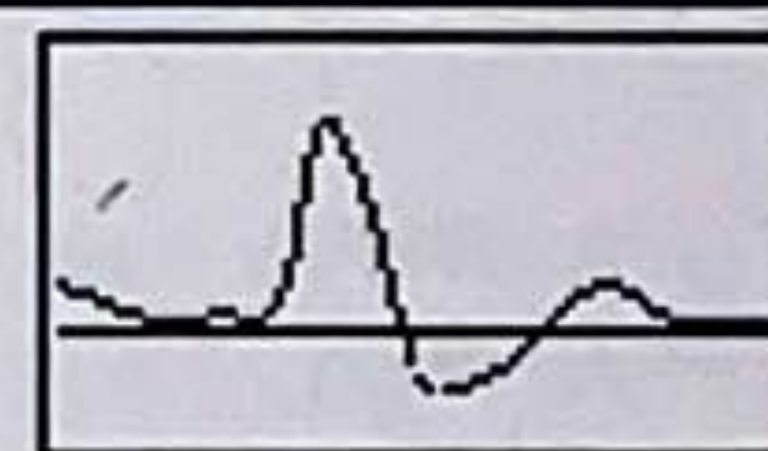
Posterior Tibial

Dorsalis Pedis

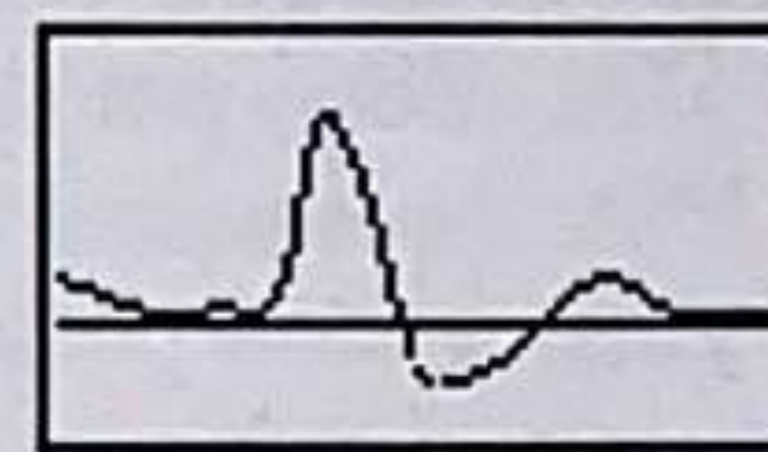
Toe Pressure

Left

Good



Good



Good



Good

130

1.05



Good



Calf Raises

118

0.95

Post Exercise

Calf Raises

100

0.81

Notes

BILATERAL LOWER LIMB ARTERIAL DUPLEX SCAN + POPLITEAL ARTERY ENTRAPMENT SYNDROME ASSESSMENT

RIGHT:

CFA: Widely patent, good triphasic waveforms, PSV 192cm/s.

PFA: Widely patent, good triphasic waveforms, PSV 77cm/s.

SFA: Widely patent along its length, good triphasic waveforms, PSV 127-168cm/s.

Assessed by David Barrett

Printed on 05/08/2022 at 4:17 pm

Checked by

POPA: Widely patent along its length, good triphasic waveforms, PSV 71-85cm/s.

TPT: Patent, 3 vessel run off.

ATA: Widely patent along its length, good biphasic waveforms at the ankle, PSV 62cm/s.

PTA: Widely patent along its length, good biphasic waveforms at the ankle, PSV 75cm/s.

PerA: Widely patent along its length, good biphasic waveforms at the ankle, PSV 51cm/s.

LEFT:

CFA: Widely patent, good triphasic waveforms, PSV 157cm/s.

PFA: Widely patent, good triphasic waveforms, PSV 96cm/s.

SFA: Widely patent along its length, good triphasic waveforms, PSV 129-130cm/s.

POPA: Widely patent along its length, good triphasic waveforms, PSV 65-75cm/s.

TPT: Patent, 3 vessel run off.

ATA: Widely patent along its length, good biphasic waveforms at the ankle, PSV 49cm/s.

PTA: Widely patent along its length, good biphasic waveforms at the ankle, PSV 105cm/s.

PerA: Widely patent along its length, good biphasic waveforms at the ankle, PSV 62cm/s.

ABPI

*Patient able to perform 2 minute calf raises before stopping due to pain bilaterally.

Right resting ABPI (1.05) is within normal limits and remains so (0.95) following 2 minute calf raise exercise test.

Left resting ABPI (1.05) is within normal limits with a slight reduction (0.81) noted following 2 minute calf raise exercise test.

POPLITEAL ARTERY ENTRAPMENT SYNDROME ASSESSMENT

RIGHT

The right distal POPA fully occludes on prone and erect plantar-flexion.

LEFT

The left distal POPA fully occludes on prone and erect plantar-flexion.

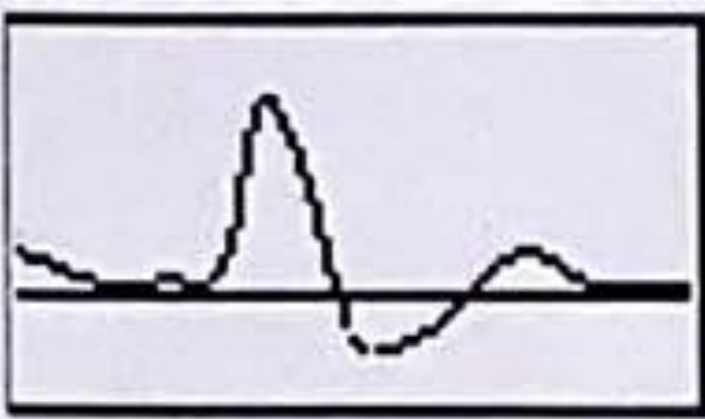
Conclusion:

Evidence of severe bilateral popliteal artery entrapment syndrome detected from this scan.

Reason Routine
Outcome Occlusion, Thrombus, Significant disease indicated

Right

126 1.00



Good

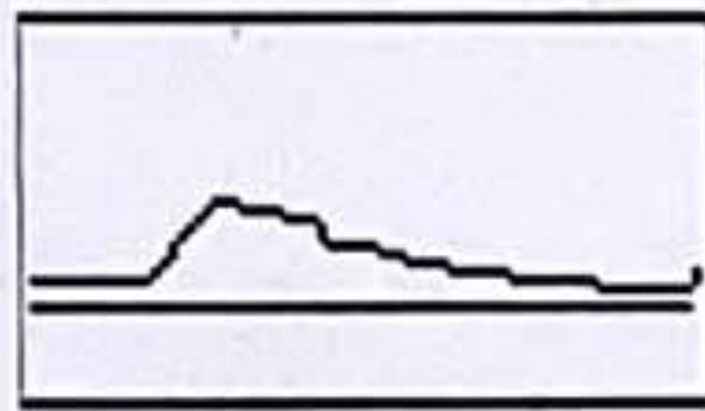


Reduced



Reduced

66 0.52



Reduced

Left

Brachial

Common Femoral

High Thigh

Low Thigh

Popliteal

High Calf

Peroneal

Anterior Tibial

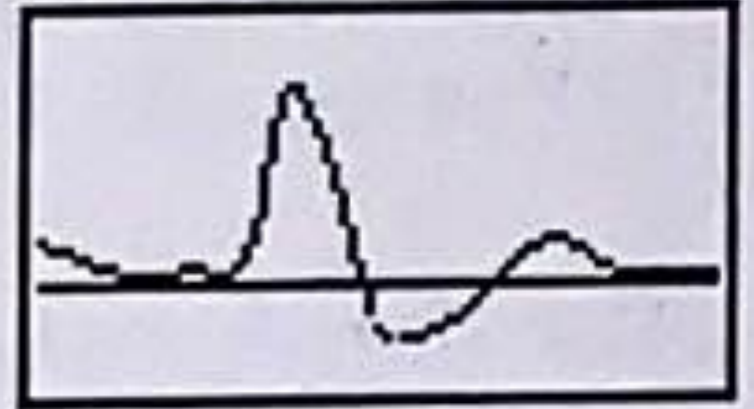
Posterior Tibial

Dorsalis Pedis

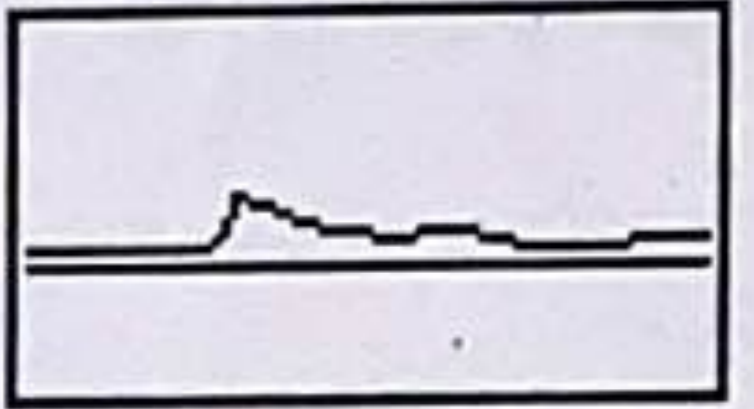
Toe Pressure

Post Exercise

Good

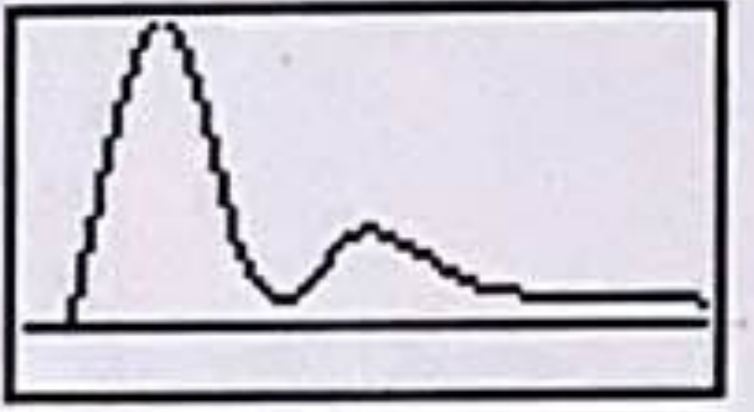


Weak



Good

112 0.89



Notes

RIGHT LOWER LIMB ARTERIAL DUPLEX SCAN

AORTA: Obscured due to bowel gas.

CIA: Obscured due to bowel gas.

EIA: Patent, mild disease along length with good triphasic waveforms, PSV 136cm/s.

CFA: Patent, mild calcified disease with good triphasic waveforms, PSV 88cm/s.

Assessed by David Barrett

Printed on 05/08/2022 at 4:15 pm

Checked by

PFA: Patent, mild disease with good biphasic waveforms, PSV 105cm/s.

SFA: Patent proximally with mild calcified disease, good triphasic waveforms PSV 87cm/s, changing to weak monophasic waveforms in the mid vessel, PSV 13cm/s. Mid vessel occludes (59cm from MM) with echolucent material ?soft plaque ?thrombus, reforming in the distal vessel (54cm from MM) via collateral flow, reduced monophasic waveforms, PSV 41cm/s. Patent distally with mild calcified disease, reduced monophasic waveforms, PSV 59cm/s. Patent through adductor canal.

POPA: Patent, mild calcified disease along its length, reduced monophasic waveforms, PSV 47-65cm/s.
TPT patent with 3 vessel run off.

ATA: Patent, mild calcified disease along its length, reduced monophasic waveforms at the ankle, PSV 21cm/s.

PTA: Patent, mild calcified disease along its length, reduced monophasic waveforms at the ankle, PSV 37cm/s.

LEFT:

CFA: Patent, mild calcified disease with good triphasic waveforms, PSV 95cm/s.

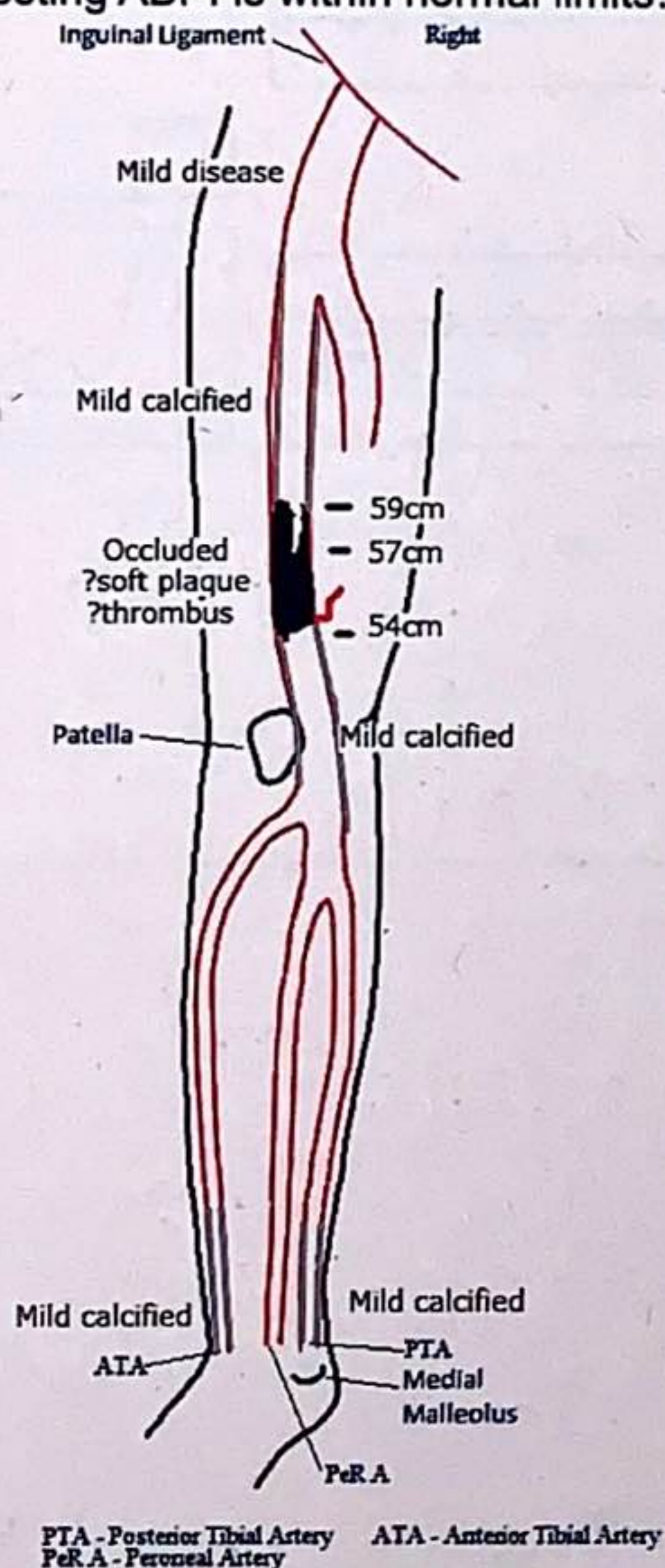
ATA: Patent, mild calcified disease along its length, weak monophasic waveforms at the ankle, PSV 21cm/s.

PTA: Patent, mild calcified disease along its length, good bouncy monophasic waveforms at the ankle.

ABPI:

Right resting ABPI is reduced.

Left resting ABPI is within normal limits.



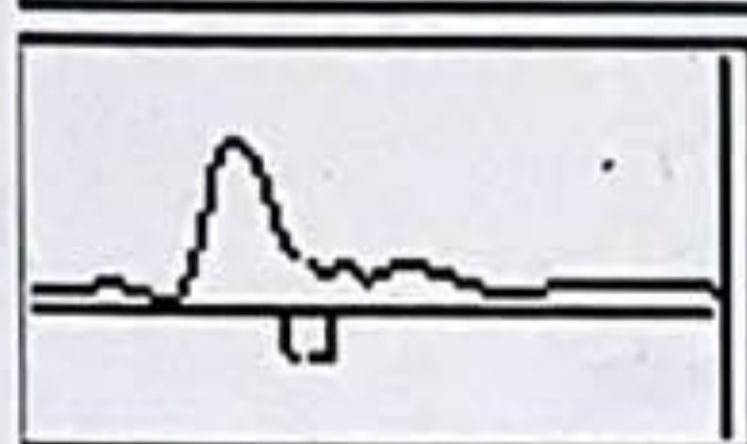
Reason Rest pain, Routine

Outcome Stenosis Moderate, Stenosis Severe, Calcified, Significant disease indicated

Right

126

1.00



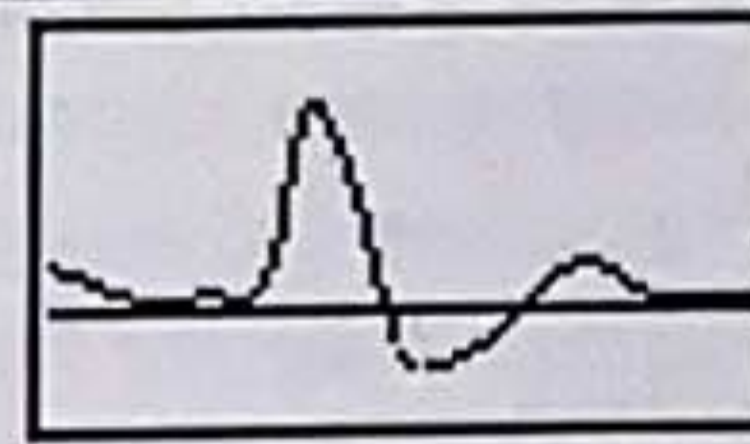
Slightly turbulent

Brachial

Common Femoral

Good

Left

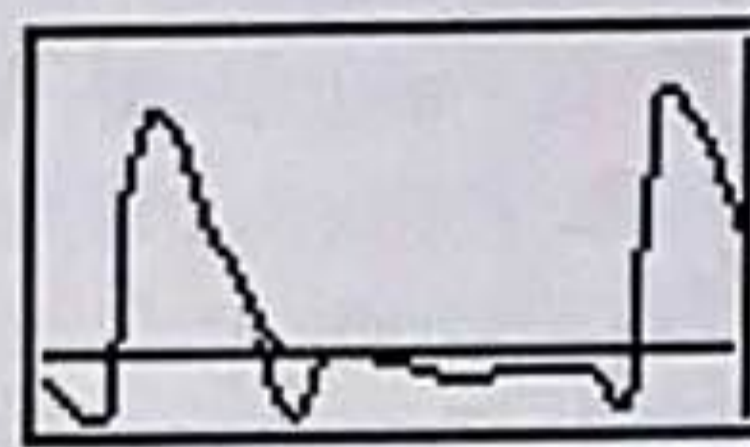


High Thigh

Low Thigh

Popliteal

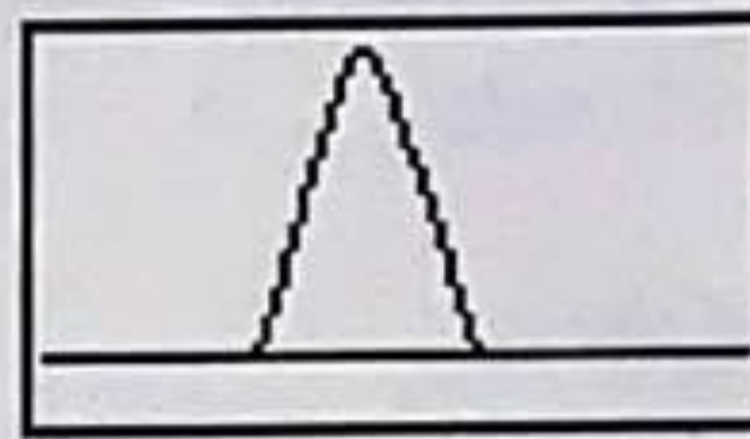
Good



High Calf

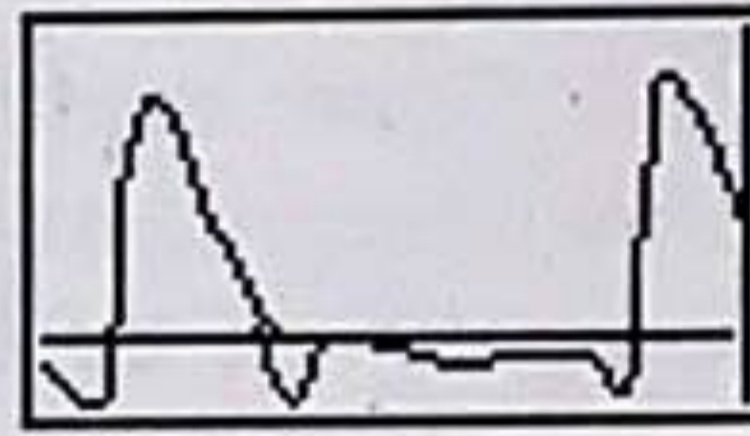
Peroneal

Good



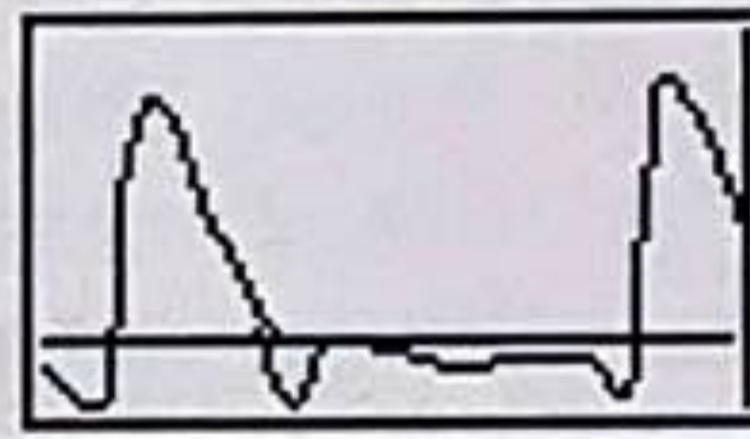
Anterior Tibial

Good



Posterior Tibial

Good



Dorsalis Pedis

Toe Pressure

Post Exercise

Notes

BILATERAL LOWER LIMB ARTERIAL DUPLEX SCAN

AORTA: Normal and uniform calibre with maximum inner-inner AP dimensions: TS plane - 1.79cm / LS plane - 1.71cm. Vessel appears mildly calcified with good triphasic waveforms, PSV 52cm/s.

RIGHT:

CIA: Patent, mild calcified disease along length with good triphasic waveforms, PSV 88cm/s.

Assessed by David Barrett

Printed on 05/08/2022 at 4:14 pm

Checked by



EIA: Mod/severe calcified stenosis identified in the mid vessel measuring ~1.62cm with velocities increasing from PSV 109cm/s to PSV 447cm/s turbulent monophasic waveforms, falling to PSV 93cm/s distally. The prox and distal vessel appears mildly calcified.

CFA: Patent, mild calcified disease with slightly turbulent monophasic waveforms, PSV 131cm/s.

PFA: Widely patent, good biphasic waveforms, PSV 41cm/s.

SFA: Patent, mild calcified disease proximally with slightly reduced monophasic waveforms, PSV 78cm/s.

Mod/severe calcified stenosis identified in the mid vessel (62cm from MM) measuring ~0.56cm, with velocities increasing from PSV 78cm/s to PSV 338cm/s turbulent monophasic waveforms, falling to PSV 63cm/s, slightly reduced monophasic waveforms. Distal vessel appears patent with heavily calcified vessel walls and mild/mod diffuse calcified disease, slightly reduced monophasic waveforms, PSV 73cm/s. Patent through adductor canal.

POPA: Patent, mild calcified disease along length with weak monophasic waveforms, PSV 29-40cm/s.

TPT: Patent with 3 vessel run off identified.

ATA: Patent, mild calcified disease along length with reduced monophasic waveforms at the ankle, PSV 27-37cm/s.

PTA: Patent, mild calcified disease along length with weak monophasic waveforms at the ankle, PSV 25cm/s.

PerA: Patent, mild calcified disease along length with weak monophasic waveforms at the ankle, PSV 25cm/s.

LEFT:

CIA: Patent, mild calcified disease along length with good triphasic waveforms, PSV 129cm/s.

EIA: Obscured proximally due to bowel gas. Mid-distal vessel appears patent with good triphasic waveforms, PSV 167cm/s.

CFA: Patent, mild calcified disease with good triphasic waveforms, PSV 152cm/s.

PFA: Patent, mild calcified disease with good biphasic waveforms, PSV 40cm/s.

SFA: Patent with mild/mod diffuse calcified disease along length, good biphasic waveforms, PSV 122-136cm/s. Patent through adductor canal.

POPA: Patent, mild calcified disease along length with good biphasic waveforms, PSV 62-63cm/s.

TPT: Patent, 3 vessel run off identified.

ATA: Patent, mild calcified disease along length with good biphasic waveforms at the ankle, PSV 42cm/s.

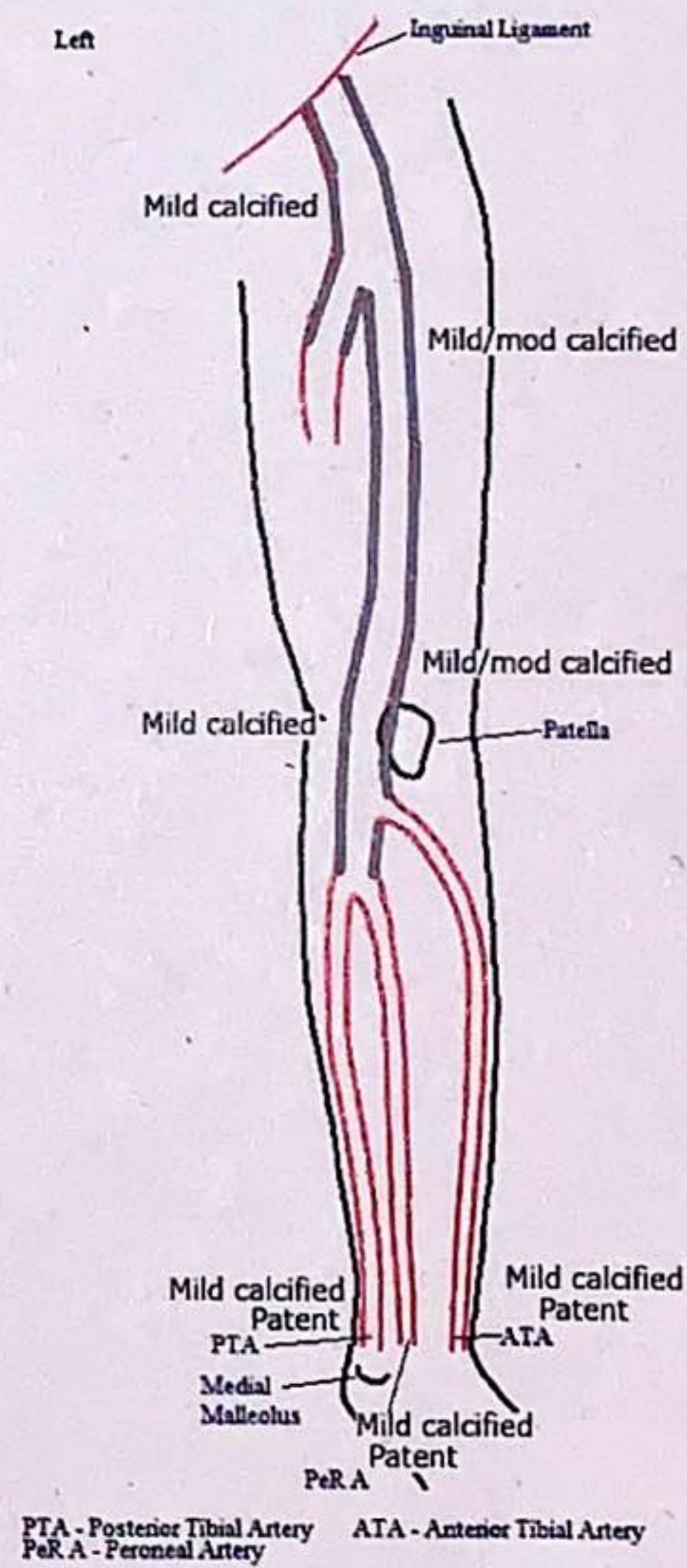
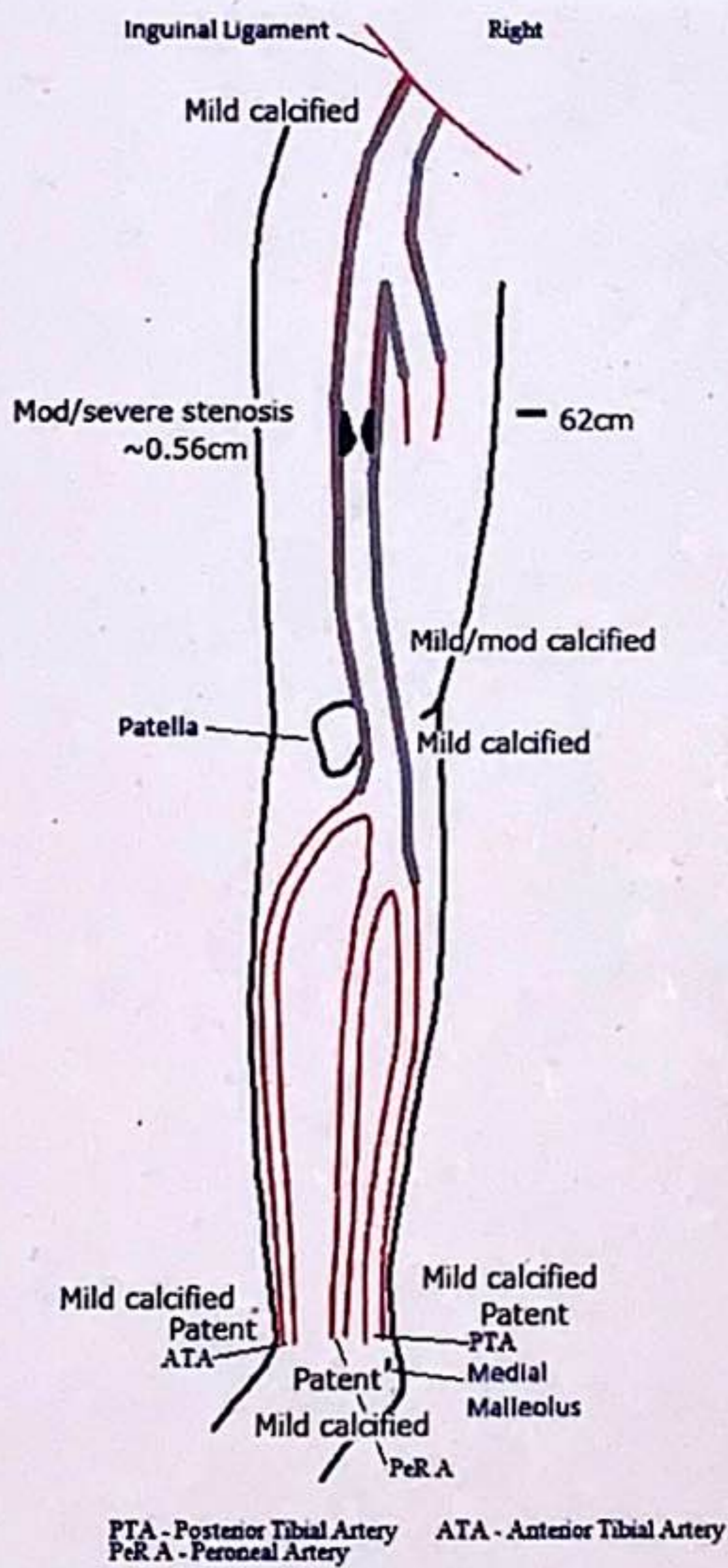
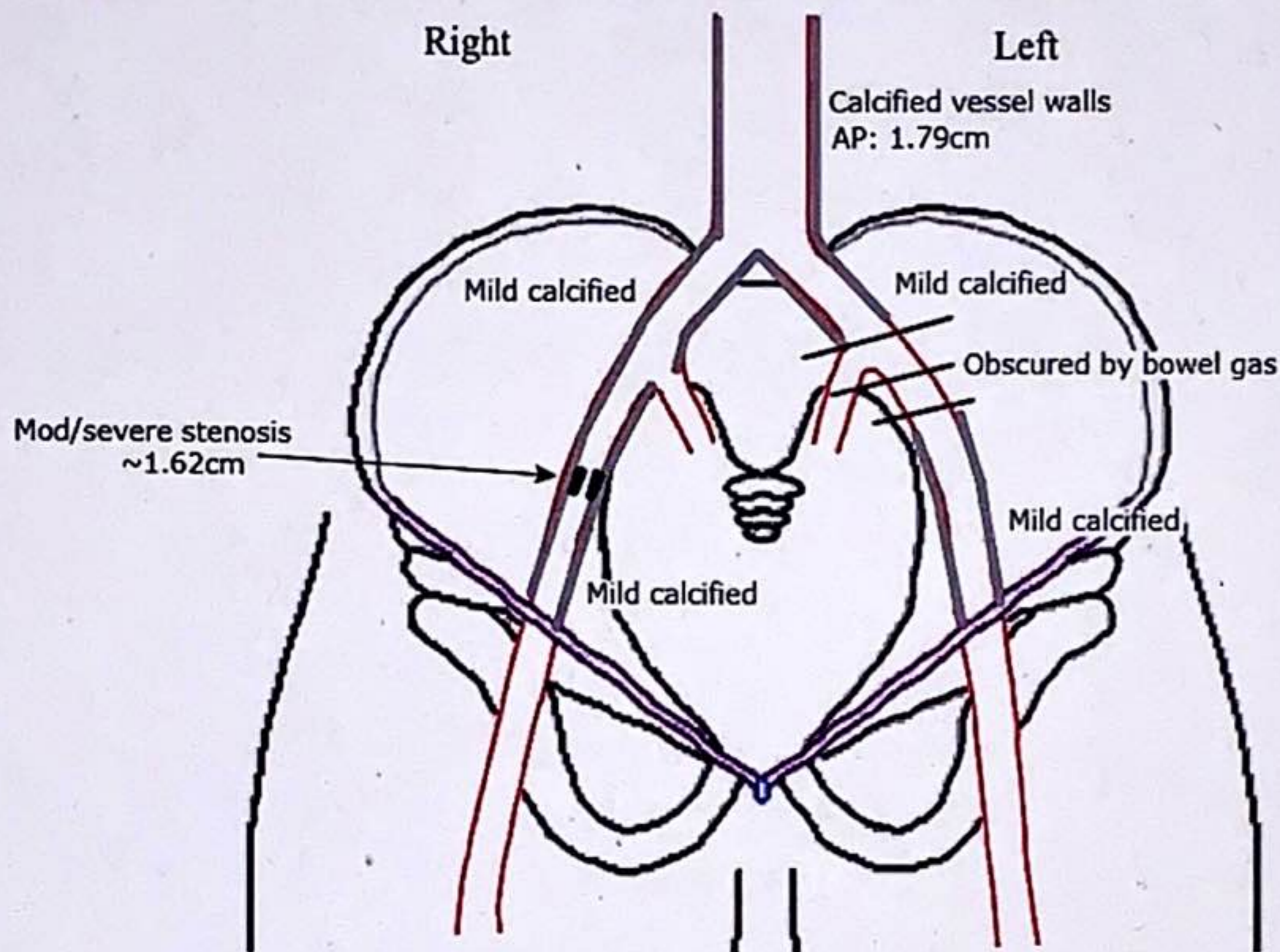
PTA: Patent, mild calcified disease along length with good biphasic waveforms at the ankle, PSV 40cm/s.

PerA: Patent, mild calcified disease along length with good monophasic waveforms at the ankle, PSV 27cm/s.

ABPI:

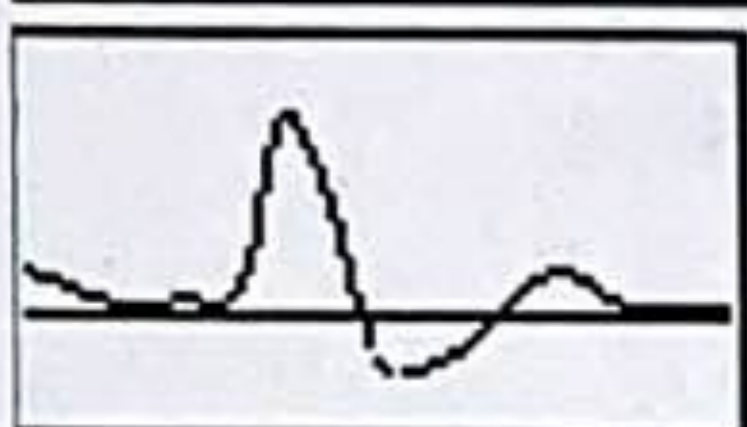
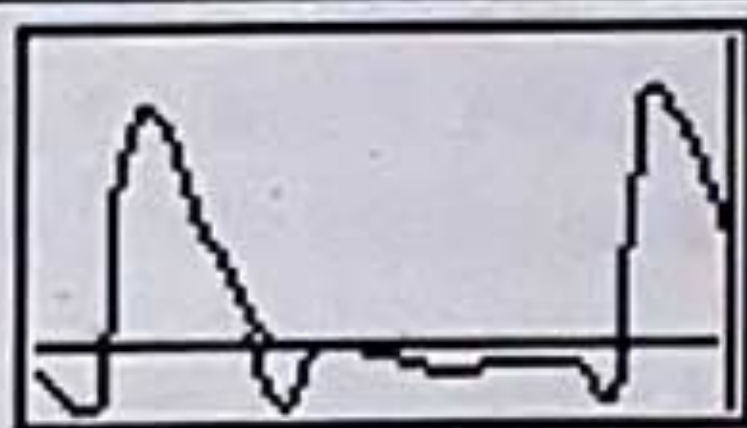

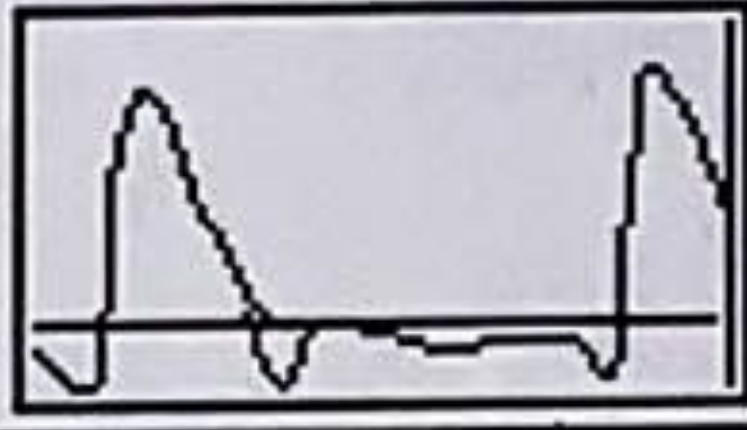

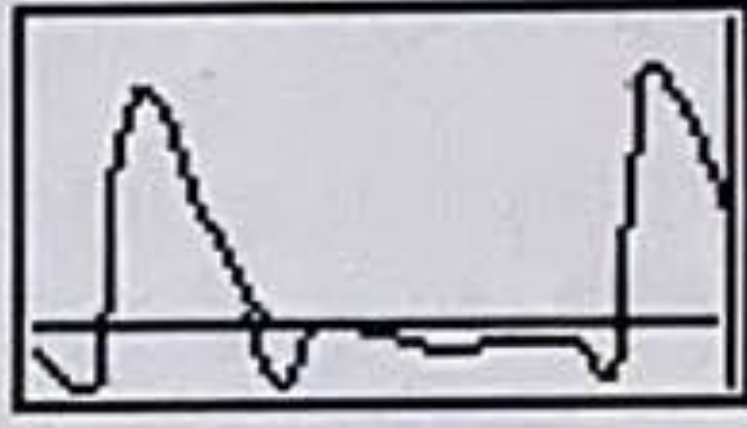
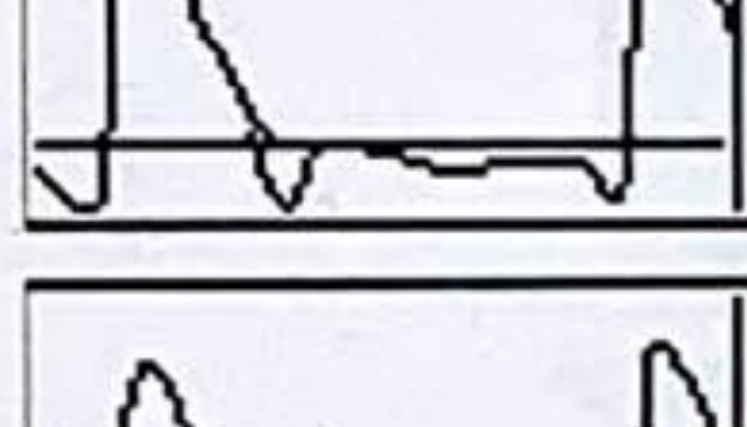
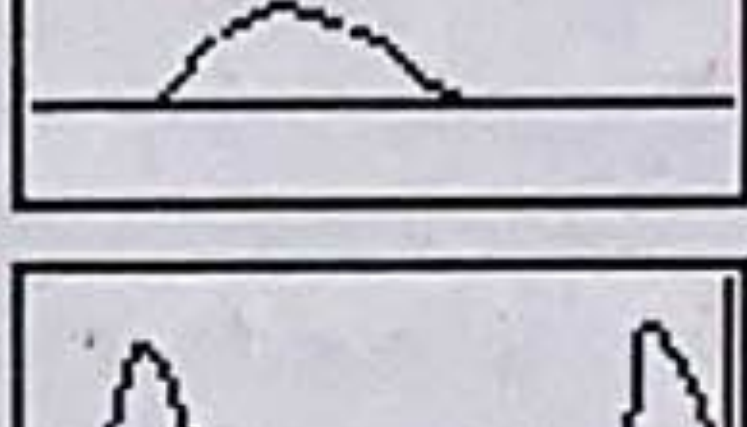
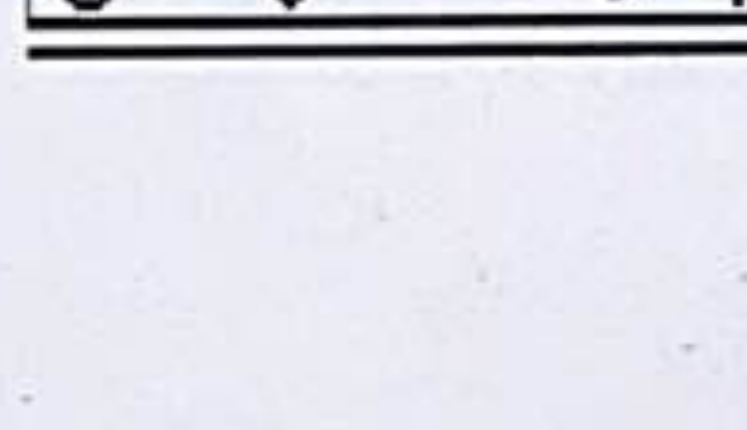
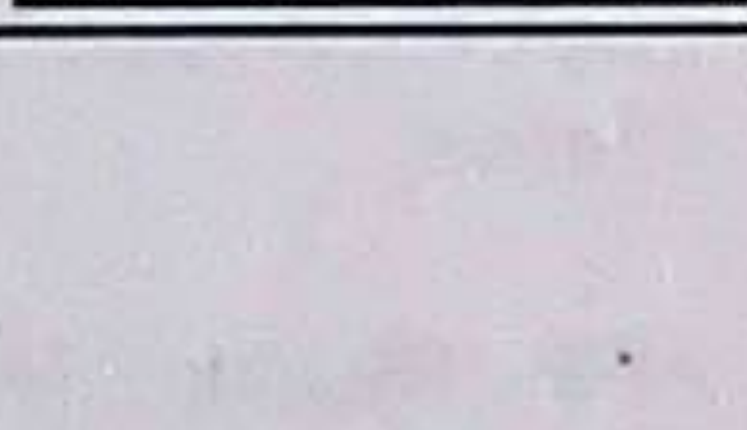
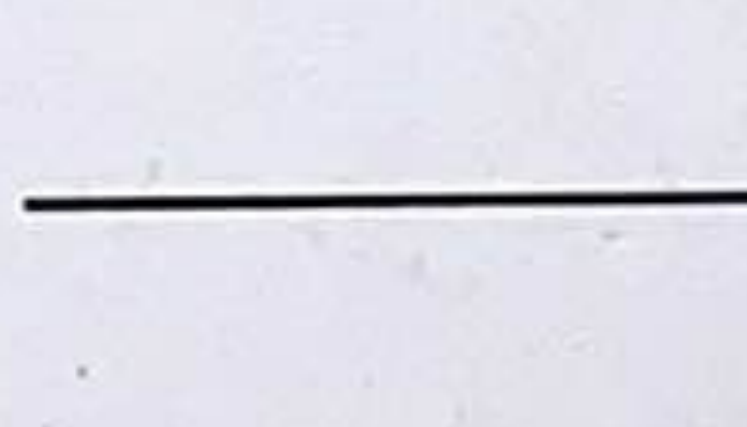
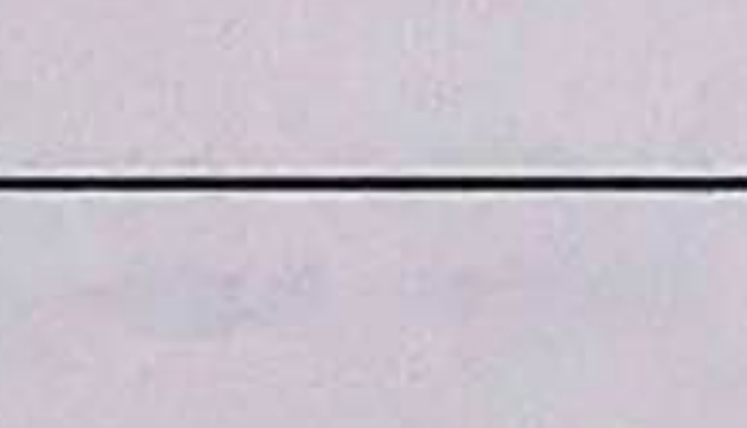
Right resting ABPI is slightly reduced.

Left resting ABPI is within normal limits.





Reason Claudication, Routine
Outcome Obscured, Calcified, Significant disease indicated

Right	Left
Brachial 150 1.00  Good	Brachial  Good
Common Femoral  Good	Common Femoral  Good
High Thigh Low Thigh Popliteal  Good	High Thigh Low Thigh Popliteal  Good
High Calf Peroneal  Good	High Calf Peroneal  Good
 Good 120 0.80	Anterior Tibial Weak 
 Good	Posterior Tibial Good 130 0.87 
Dorsalis Pedis	Dorsalis Pedis
Toe Pressure	Toe Pressure
Foot Flex 90 0.60	Post Exercise Foot Flex 120 0.80

Notes

BILATERAL LOWER LIMB ARTERIAL DUPLEX SCAN

AORTA: Vessel appears aneurysmal with maximum inner-inner AP dimensions: TS plane - 4.01cm / LS plane - 4.1cm. Mural thrombus identified within AAA lumen forming a 50-60% reduction in luminal diameter. Vessel appears patent, mild calcified disease with good biphasic waveforms, PSV 58cm/s.

RIGHT:

Assessed by David Barrett

Printed on 05/08/2022 at 4:18 pm

Checked by

CIA: Obscured due to bowel gas.

EIA: Patent, mild calcified disease along its length with good biphasic waveforms, PSV 215-181cm/s.

CFA: Patent, mod calcified disease with good triphasic waveforms, PSV 199cm/s.

PFA: Patent, mod calcified disease at the origin with turbulent triphasic waveforms, PSV 316cm/s.

SFA: Patent, mild calcified disease along its length with good biphasic waveforms, PSV 115-87cm/s. Patent through adductor canal.

POPA: Patent, mild calcified disease with good biphasic waveforms, PSV 54-75cm/s. TPT appears patent and mildly calcified with 3 vessel run off noted.

ATA: Patent, calcified vessel walls along its length with good biphasic waveforms at the ankle, PSV 69cm/s.

PTA: Patent, calcified vessel walls along its length with good biphasic waveforms at the ankle, PSV 71cm/s.

PerA: Patent, calcified vessel walls along its length with good biphasic waveforms at the ankle, PSV 25cm/s.

LEFT:

CIA: Obscured due to bowel gas.

EIA: Patent, mild calcified disease with slightly turbulent biphasic waveforms, PSV 173-297cm/s.

CFA: Patent, mild/mod calcified disease with good biphasic waveforms, PSV 156cm/s.

PFA: Patent, mild/mod calcified disease with good triphasic waveforms, PSV 224cm/s.

SFA: Patent, mild calcified disease along its length with good biphasic waveforms PSV 151-137cm/s. Patent through adductor canal.

POPA: Patent, mild calcified disease along its length with good biphasic waveforms, PSV 63-53cm/s. TPT appears patent and mildly calcified disease, 2 vessel run off noted. ATA run off poorly visualised ?patency.

ATA: Poorly visualised proximally with no flow identified, ?occluded. Retrograde flow noted in mid-distal vessel supplied via collateral branch (12cm from MM). Antegrade flow returns at the ankle. Calcified vessel walls along its length, weak monophasic waveforms at the ankle, PSV 22cm/s.

PTA: Patent, calcified vessel walls along its length with good biphasic waveforms at the ankle, PSV 92cm/s.

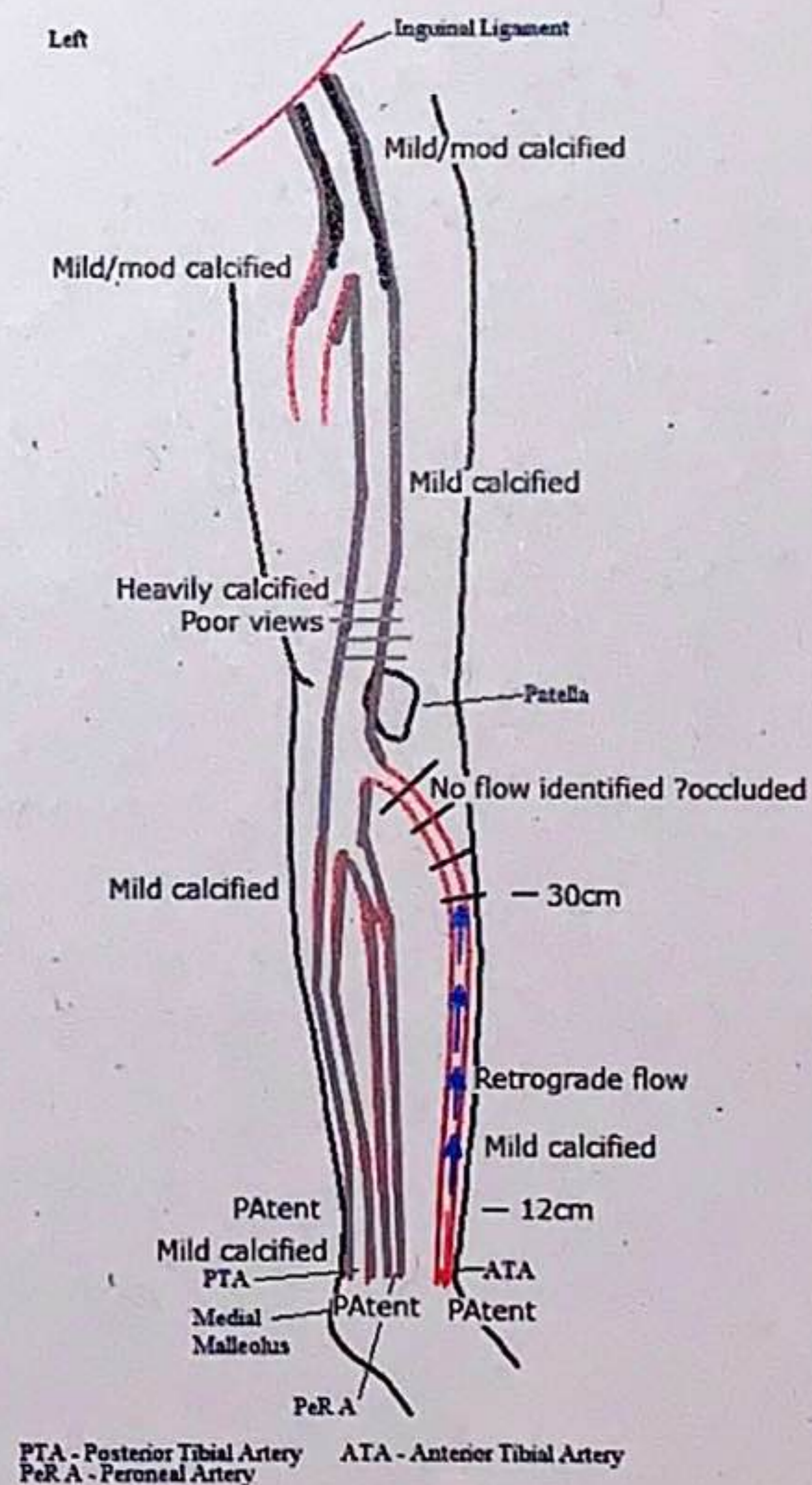
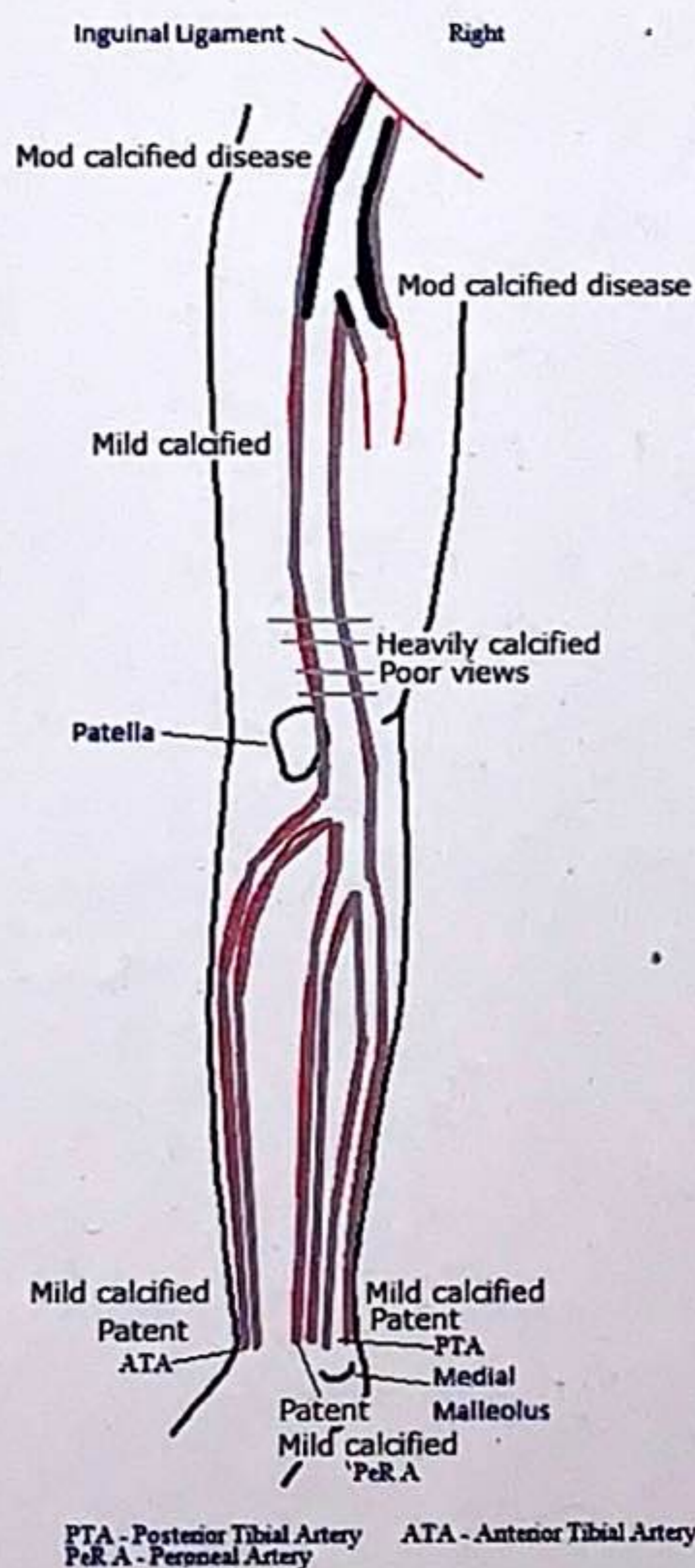
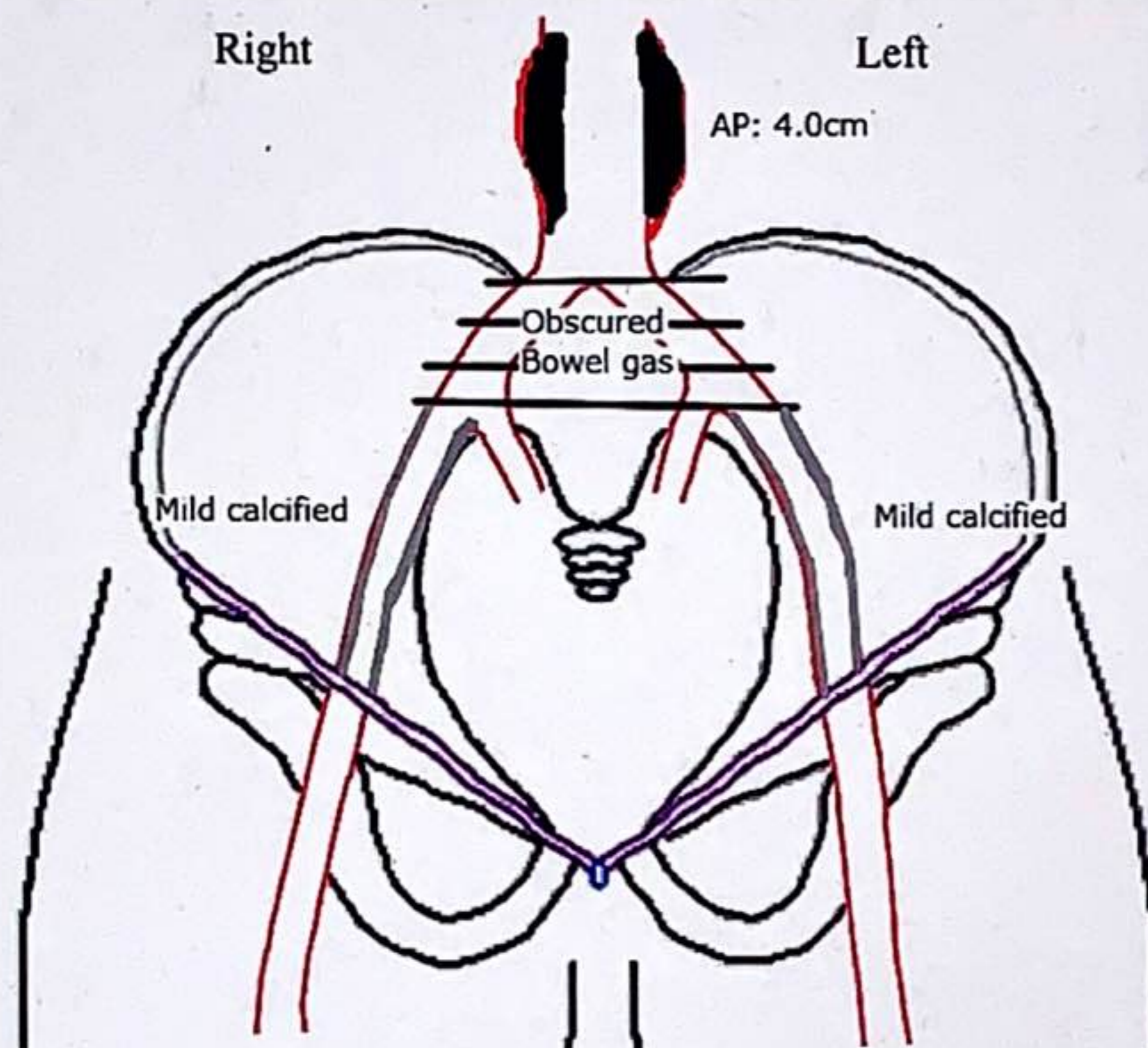
PerA: Patent, calcified vessel walls along its length with good biphasic waveforms at the ankle, PSV 41cm/s.

ABPI: Resting ABPIs are within normal limits bilaterally.

Significant reduction noted in right ABPI following 1 minute foot flex exercise test.

No change in left ABPI following 1 minute foot flex exercise test.

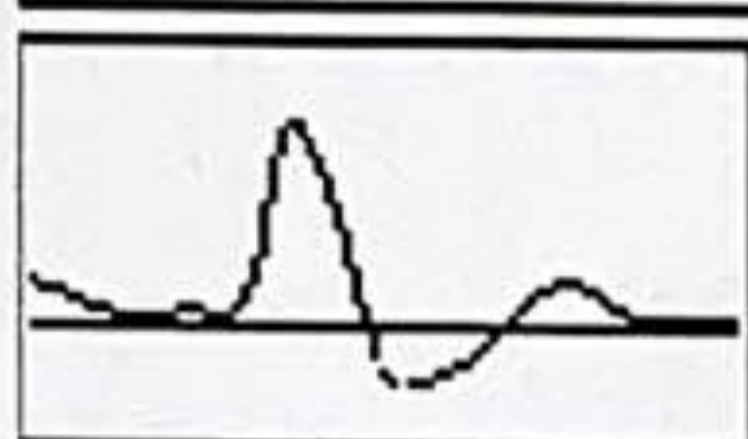
Significant disease indicated due to reduction in right ABPI following exercise test ?significant common iliac disease - suggest further imaging for clinical correlation.



Reason Ulceration
Outcome Stenosis Severe, Significant disease indicated

Right

140 1.00



Good

Brachial

Common Femoral

Good

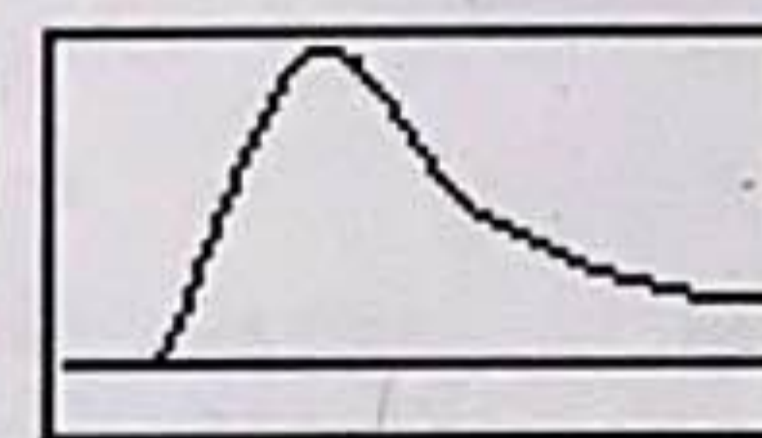
Left

High Thigh

Low Thigh

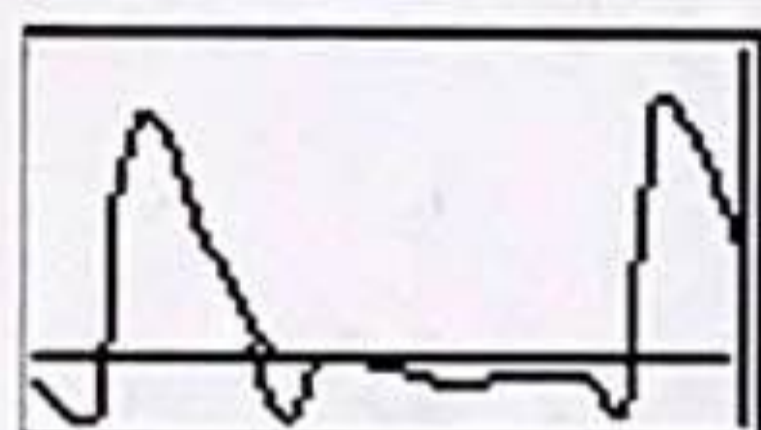
Popliteal

Turbulent



High Calf

Peroneal

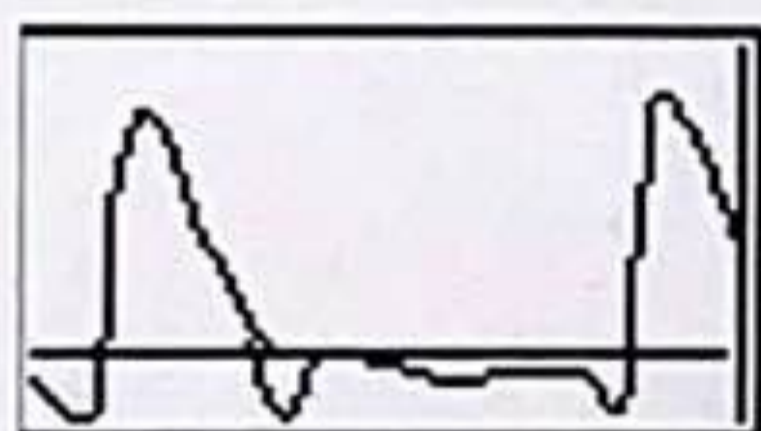
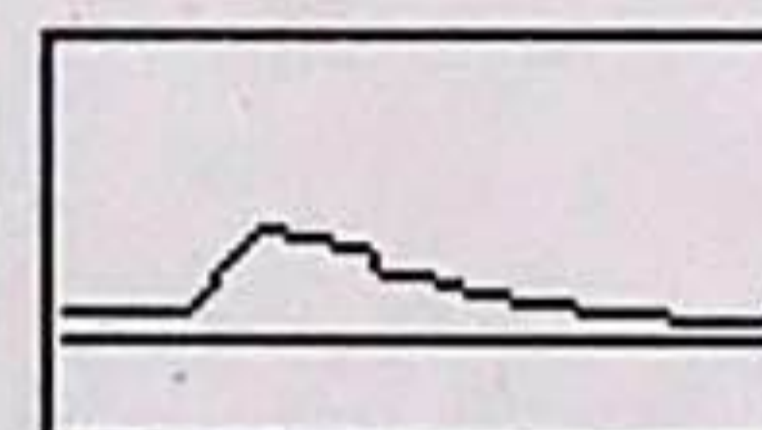


Good

168 1.20

Anterior Tibial

Reduced

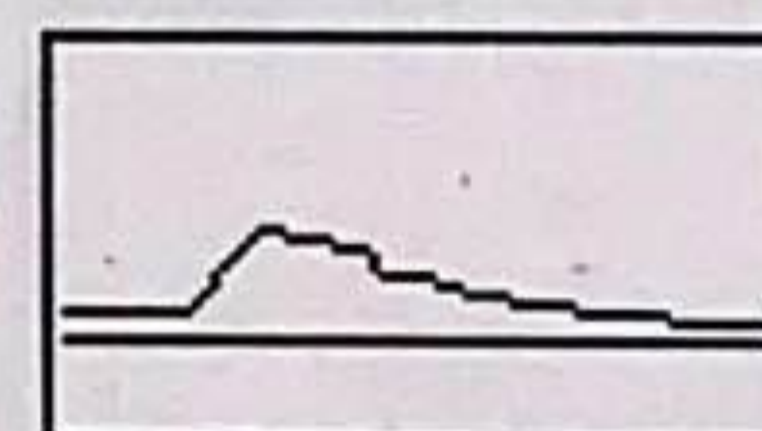


Good

Posterior Tibial

Reduced

112 0.80



Dorsalis Pedis

Toe Pressure

Post Exercise

Notes

LEFT LOWER LIMB ARTERIAL DUPLEX ASSESSMENT

AORTA: Normal and uniform calibre with maximum inner-inner AP dimensions: TS plane - 1.48cm. Vessel appears mildly calcified with good biphasic waveforms, PSV 77cm/s.

CIA: Widely patent, good triphasic waveforms, PSV 105cm/s.

EIA: Widely patent, good triphasic waveforms, PSV 125cm/s.

CFA: Patent, mild disease with good triphasic waveforms, PSV 141cm/s.

Assessed by David Barrett

Printed on 05/08/2022 at 4:22 pm

Checked by

PFA: Patent, mild disease with good biphasic waveforms, PSV 67cm/s.

SFA: Patent prox-mid vessel with mild disease, good triphasic waveforms, PSV 64-67cm/s. Mild/mod calcified disease noted distally with good triphasic waveforms, PSV 67cm/s. Very distal vessel was poorly visualised due to acoustic shadowing however where seen severe stenosis identified distal SFA/Prox POPA at level of adductor canal, measuring ~1cm, velocities increasing from PSV 106cm/s to PSV +766cm/s, turbulent monophasic flow.

POPA: Patent, mild/mod calcified disease with reduced monophasic waveforms, PSV 44-72cm/s. TPT appears patent with 3 vessel run off.

ATA: Patent, mild calcified disease along length, reduced monophasic waveforms at the ankle, PSV 28cm/s.

PTA: Patent, mild calcified disease along length, reduced monophasic waveforms at the ankle, PSV 42cm/s.

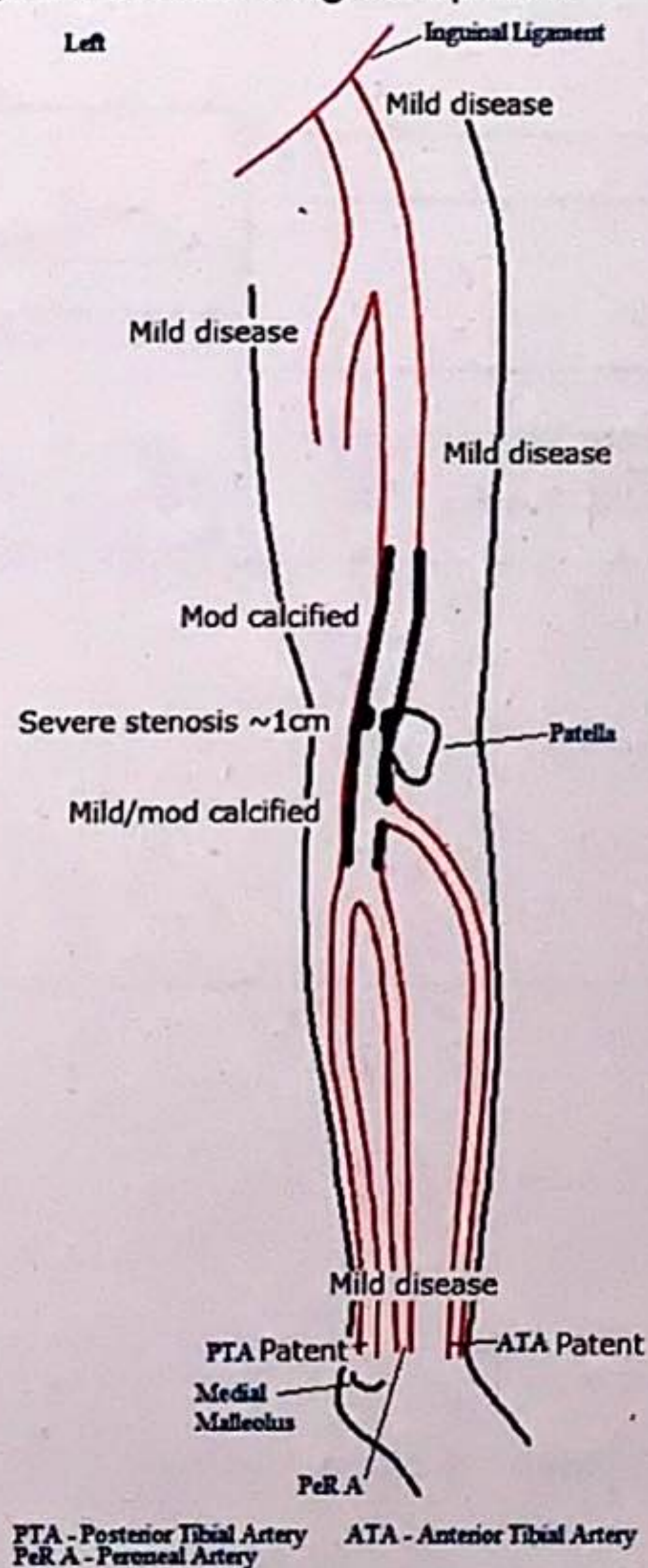
ABPIs:

Right resting ABPI within normal limits.

Left resting ABPI is slightly reduced.

CONCLUSION: Evidence of severe left lower limb arterial disease.

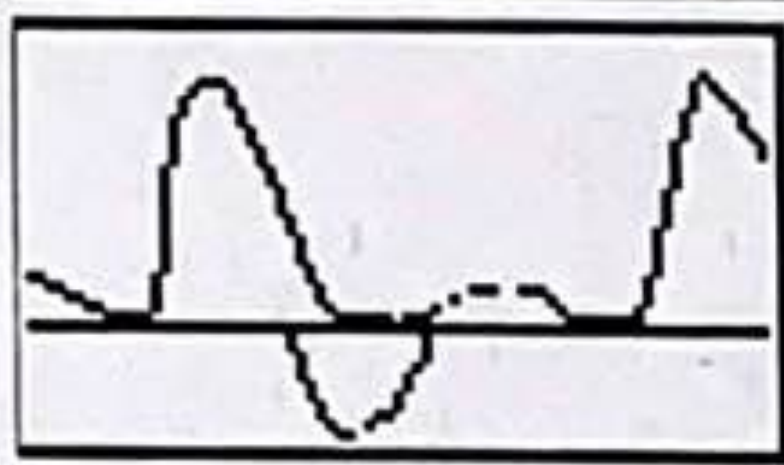
Suggest vascular surgical opinion.



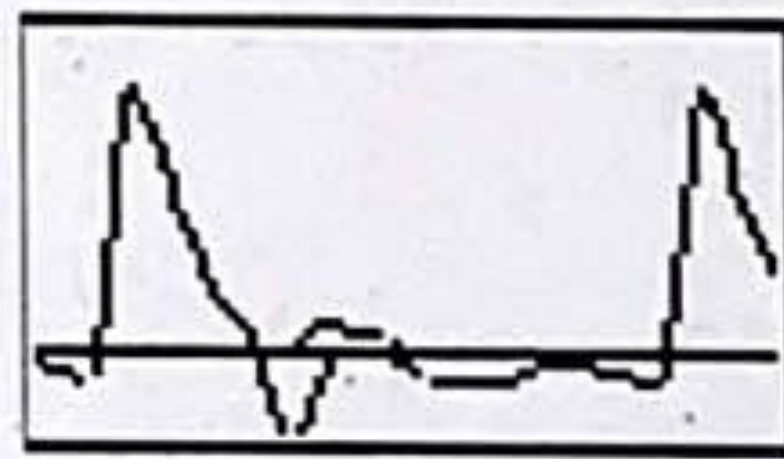
Reason Routine, Ulceration
 Outcome Stenosis Severe, Significant disease indicated

Right

140 1.00



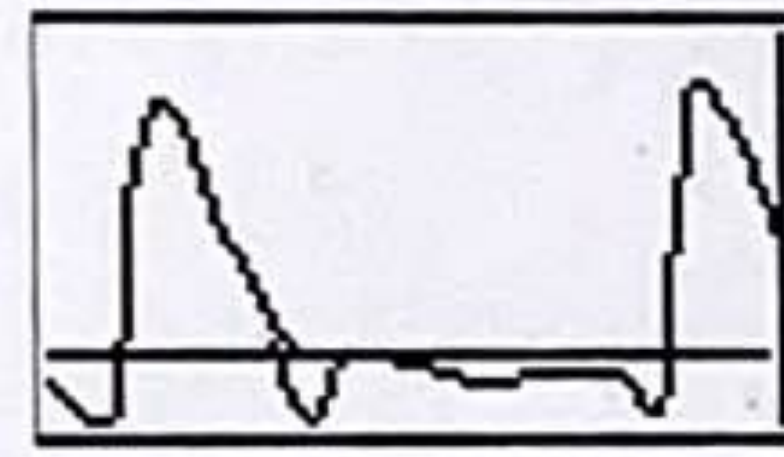
Good



Good



Absent



Good

138

0.99

Brachial

Common Femoral

High Thigh

Low Thigh

Popliteal

High Calf

Peroneal

Anterior Tibial

Posterior Tibial

Dorsalis Pedis

Toe Pressure

Post Exercise

Left

Good

Slightly Reduced

Reduced

68

0.49

Slightly Reduced

Notes

LEFT LOWER LIMB ARTERIAL DUPLEX SCAN

AORTA: Normal and uniform calibre with maximum inner-inner AP dimensions: TS - 1.58cm / LS - 1.52cm.
 Vessel appears mildly calcified with good triphasic waveforms, PSV 121cm/s.

CIA: Patent with mild disease along length, good triphasic waveforms, PSV 209cm/s.

EIA: Patent with mild disease along length, good triphasic waveforms, PSV 298cm/s.

Assessed by David Barrett

Printed on 05/08/2022 at 4:24 pm

Checked by

CFA: Patent, mild calcified disease with good triphasic waveforms, PSV 122cm/s.

PFA: Widely patent, good bouncy monophasic waveforms, PSV 198cm/s.

SFA: Mild/mod stenosis noted at origin measuring ~1.6cm, slightly reduced monophasic waveforms, PSV 92cm/s. Mild/mod disease noted prox-mid vessel with slightly reduced monophasic waveforms, PSV 110cm/s. Severe stenosis of mixed echogenicity noted in mid-distal vessel (68cm from MM) measuring ~0.93cm, velocities increasing from PSV 110cm/s to PSV 662cm/s. There is a further mod stenosis of mixed and echolucent ?soft plaque noted distally (65cm from MM) measuring ~1.2cm, turbulent monophasic waveforms, PSV 177cm/s. Mild disease noted in very distal vessel, reduced monophasic waveforms, PSV 89cm/s. Patent through adductor canal.

POPA: Patent, mild disease along length with slightly reduced monophasic waveforms, PSV 76-92cm/s.

TPT appears patent with 3 vessel run off.

ATA: Widely patent along length with reduced monophasic waveforms at the ankle, PSV 51cm/s.

PTA: Widely patent along length with slightly reduced monophasic waveforms at the ankle, PSV 143cm/s.

RIGHT

CFA: Patent, mild calcified disease with good biphasic waveforms, PSV 165cm/s.

ATA: Retrograde flow noted distally, supplied by collateral vessel. No flow noted at the ankle ?occluded.

PTA: Widely patent, good biphasic waveforms at the ankle, PSV 70cm/s.

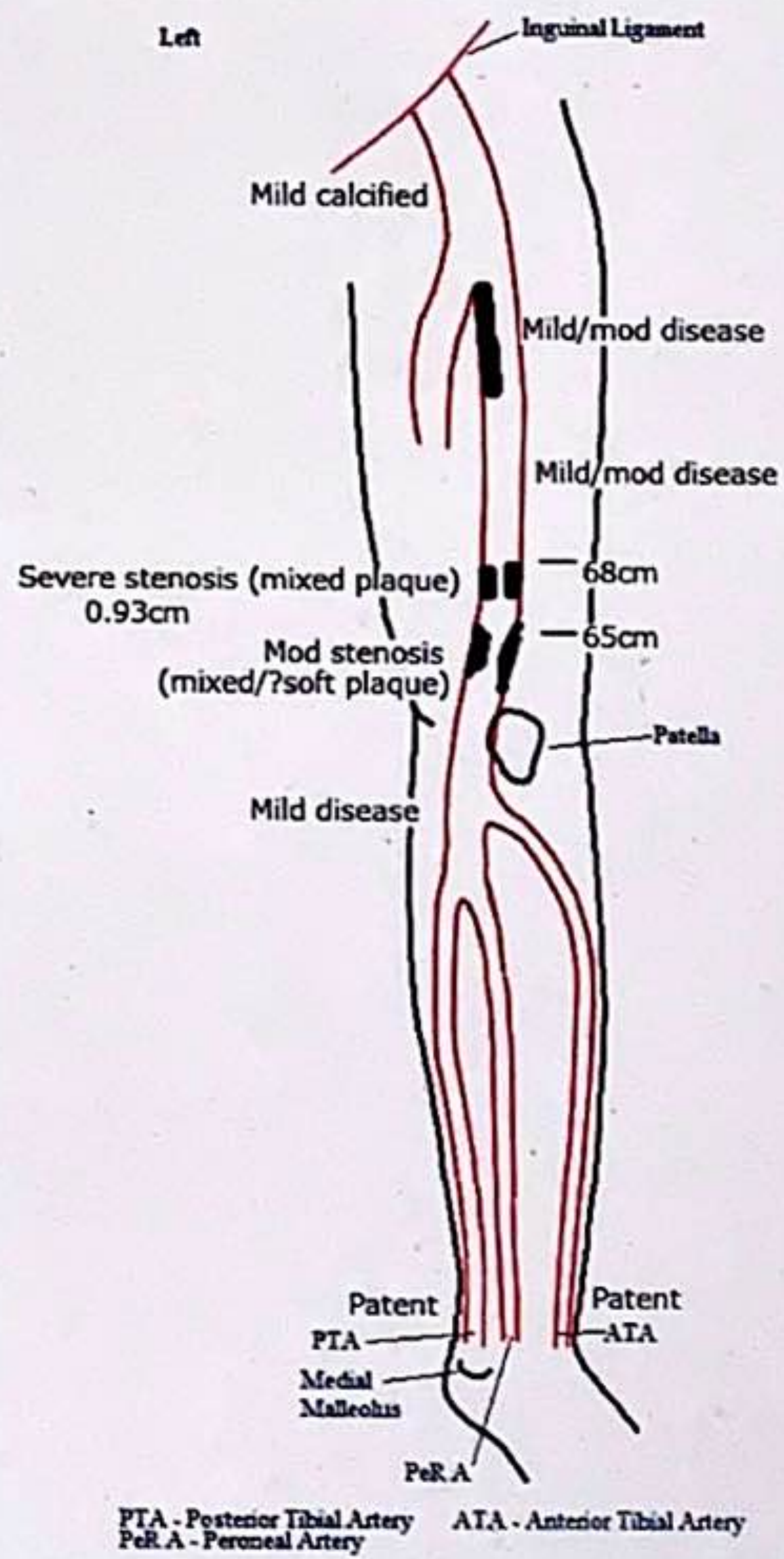
ABPI:

Right resting ABPI within normal limits.

Left resting ABPI is significantly reduced.

Conclusion: Evidence of severe left lower limb arterial disease.

SUGGEST VASCULAR SURGICAL OPINION.

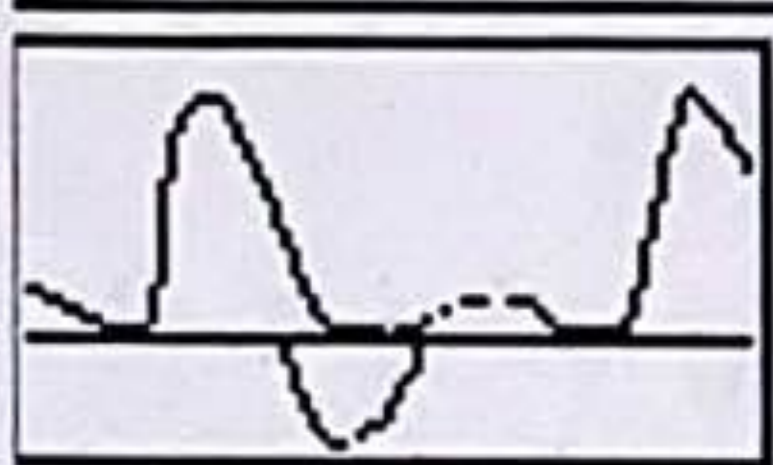


Reason Routine
Outcome disease severe, Occlusion, Calcified

Right

110

1.00



Good



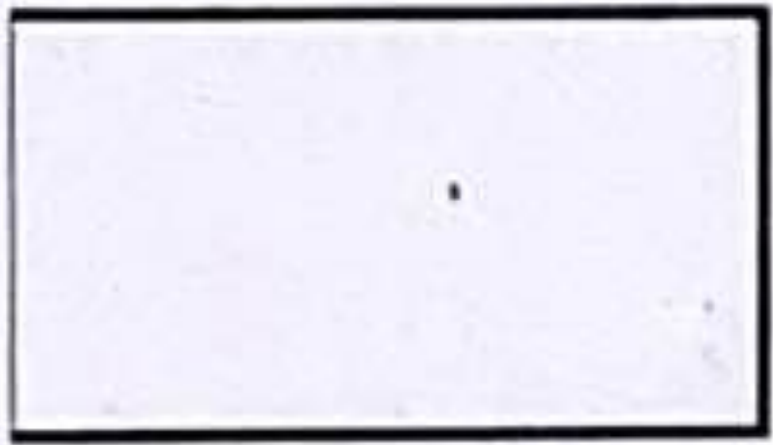
Weak



Reduced

54

0.49



Absent

Brachial

Common Femoral

High Thigh

Low Thigh

Popliteal

High Calf

Peroneal

Anterior Tibial

Posterior Tibial

Dorsalis Pedis

Toe Pressure

Post Exercise

Left

Good

Weak

Reduced

60

0.55

Absent

Notes

BILATERAL LOWER LIMB ARTERIAL DUPLEX SCAN

*Challenging assessment due to patient pain and movement.

AORTA/CIA/EIA: Not assessed due to patient discomfort with pressure.

RIGHT

Assessed by David Barrett

Printed on 05/08/2022 at 4:25 pm

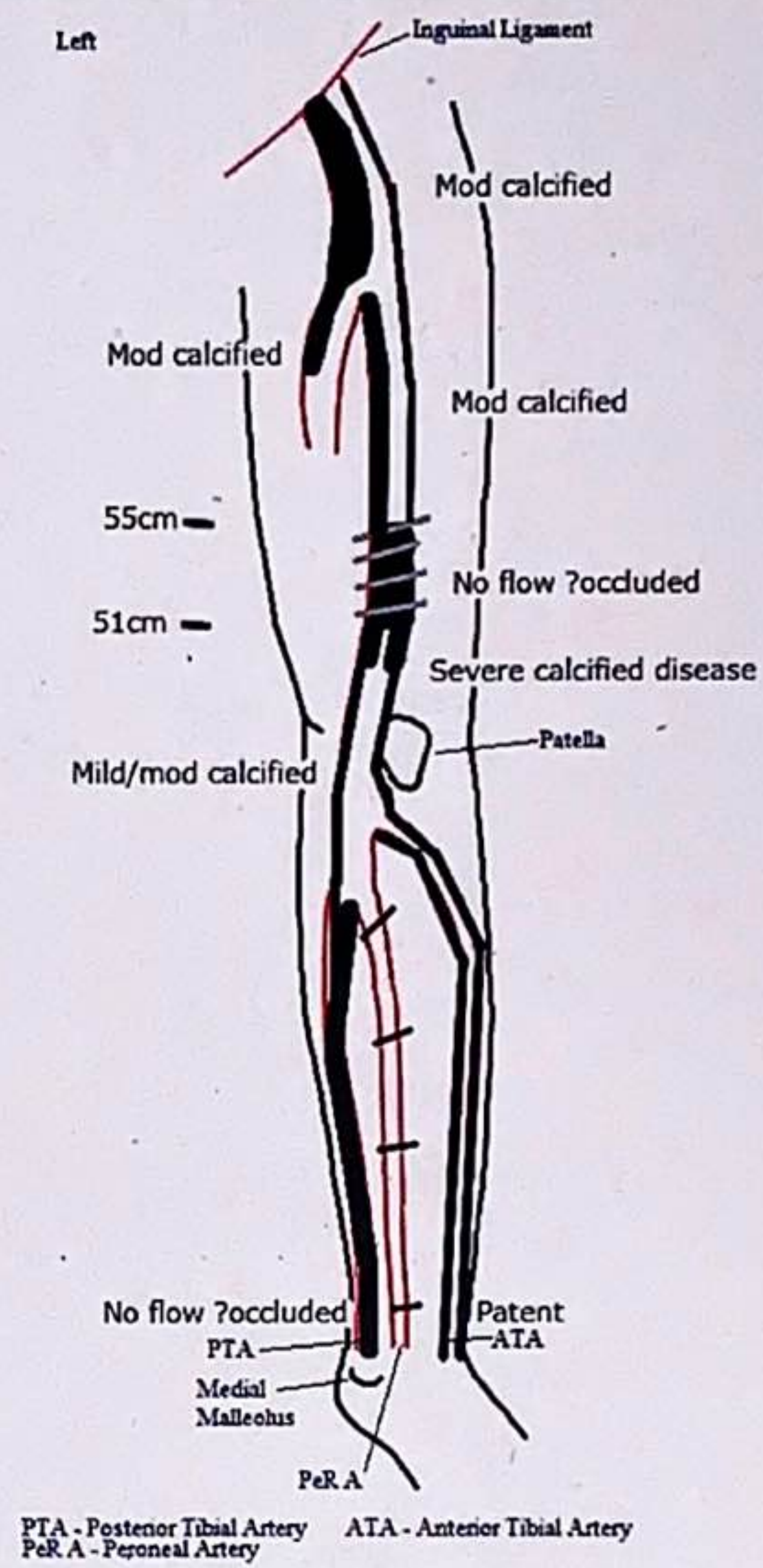
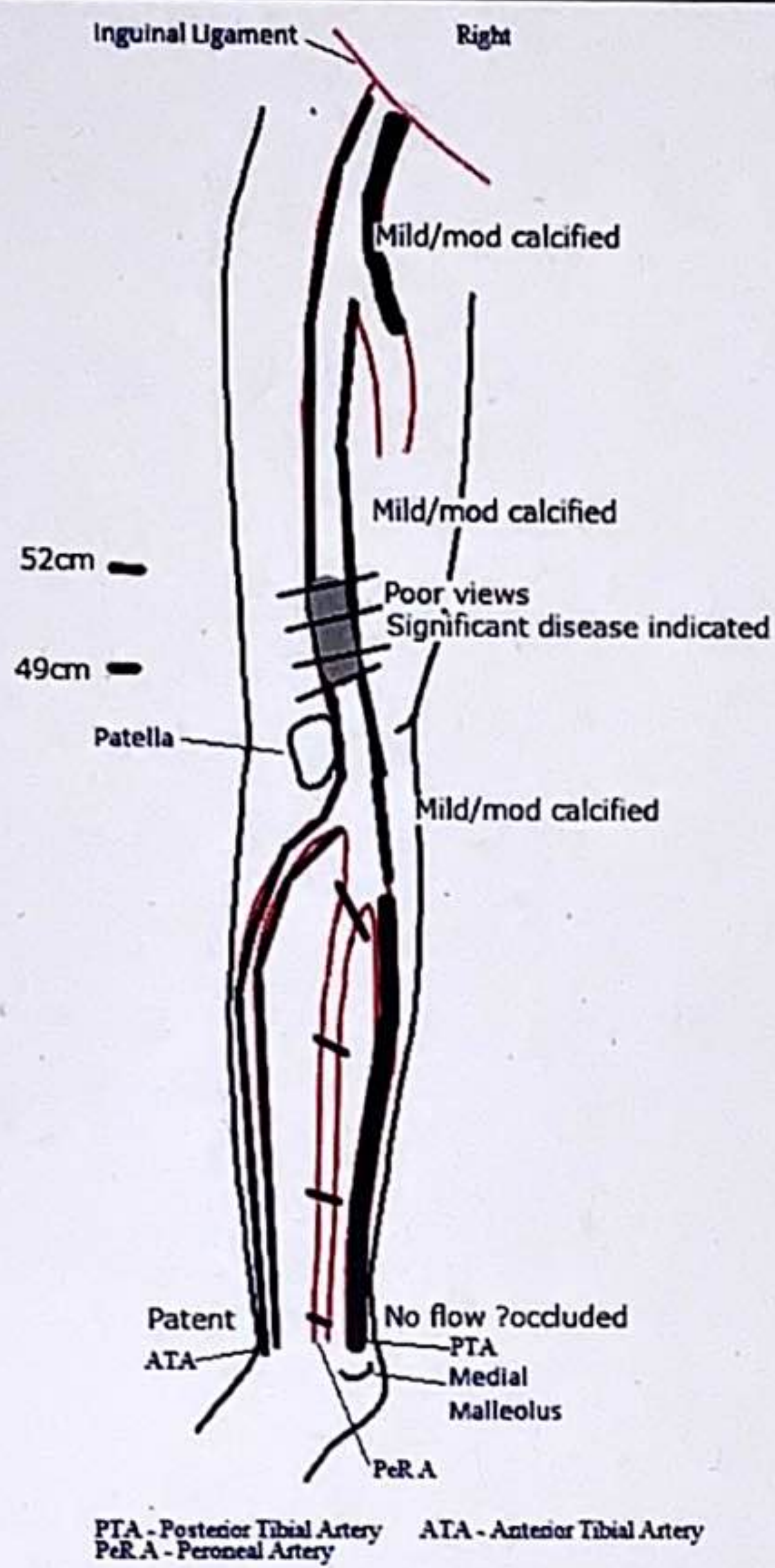
Checked by

CFA: Patent, mild/mod calcified disease with good triphasic waveforms, PSV 134cm/s.
PFA: Patent, mild/mod calcified disease with good triphasic waveforms, PSV 118cm/s.
SFA: Patent in the prox-mid vessel with mild/mod diffuse calcified disease, good bouncy monophasic waveforms PSV 79-68cm/s, heavily calcified walls noted along length. Vessel is obscured distally due to heavy calcification (52cm - 49cm from MM) with slightly turbulent monophasic waveforms changing to slightly reduced monophasic waveforms in very distal vessel, PSV 106-45cm/s. ?significant disease within obscured region.
POPA: Patent with mild/mod calcified disease along length, weak monophasic waveforms PSV 34-41cm/s. TPT appears patent with 1 vessel run off noted.
ATA: Patent with heavily calcified walls along length, reduced monophasic waveforms at the ankle, PSV 30cm/s.
PTA: No flow identified, ?occluded.
PerA: Poor views due to calcification ?full patency.

LEFT:

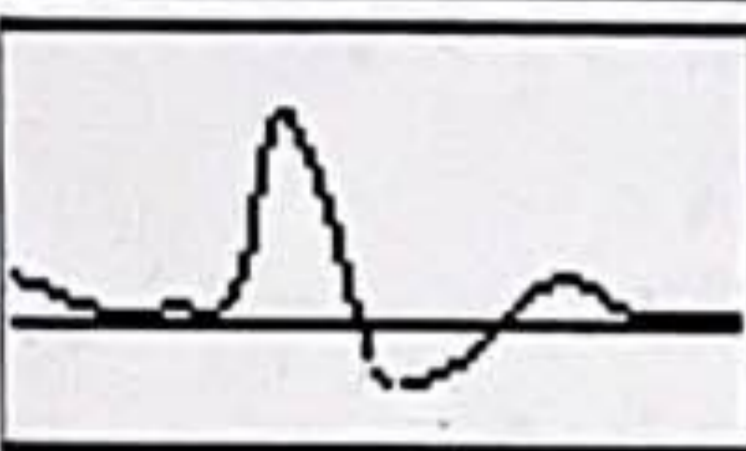
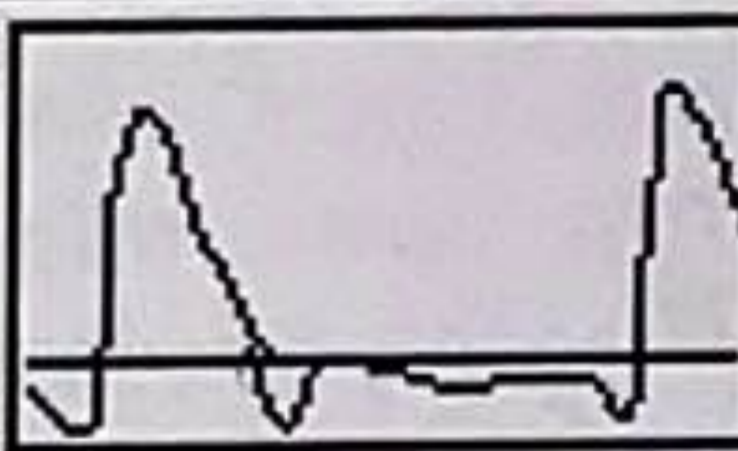
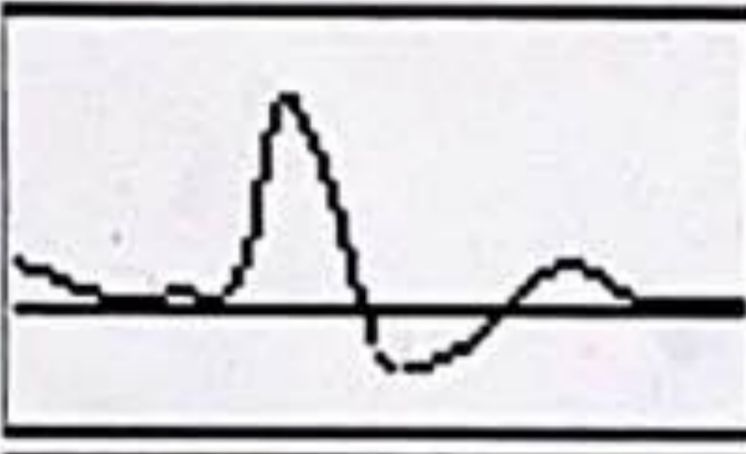

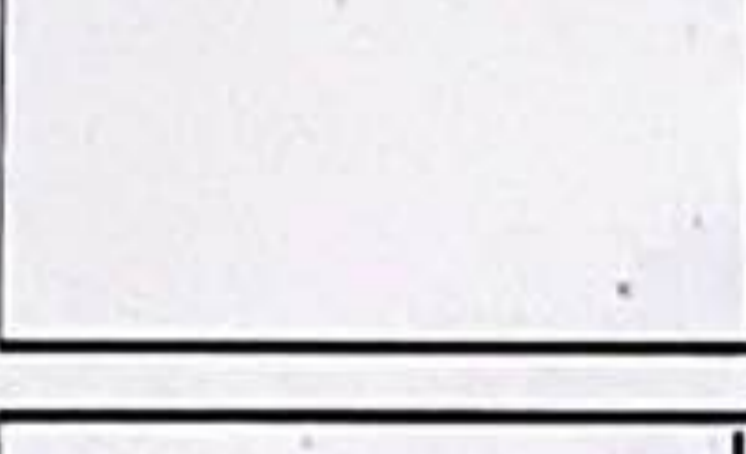
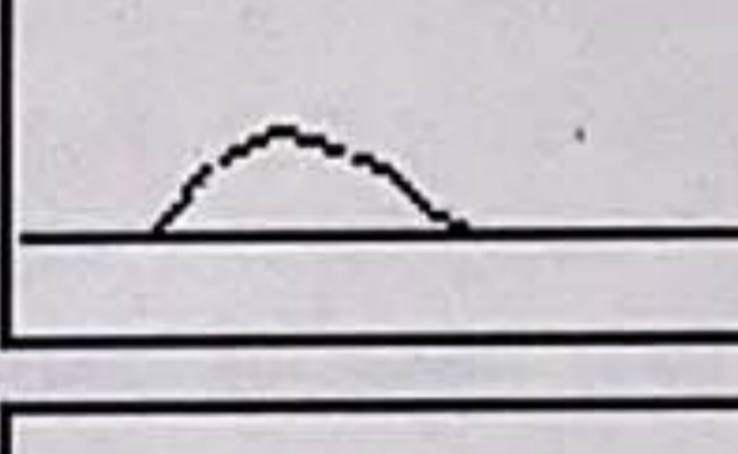
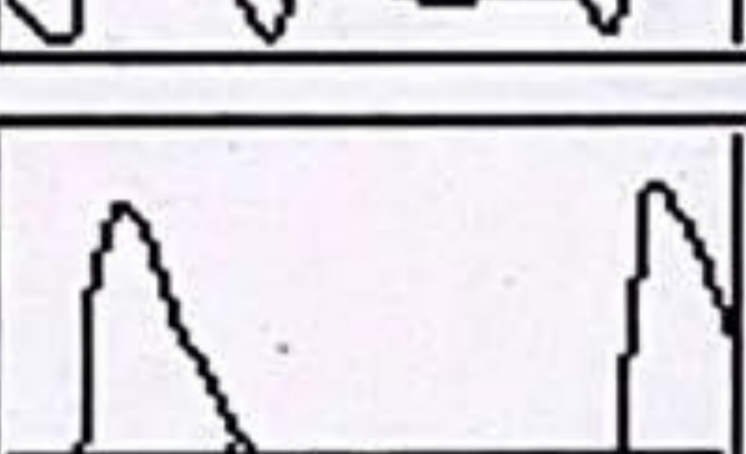
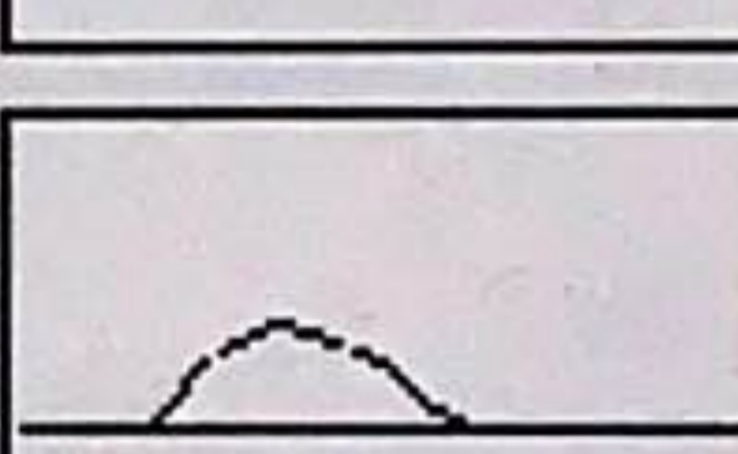


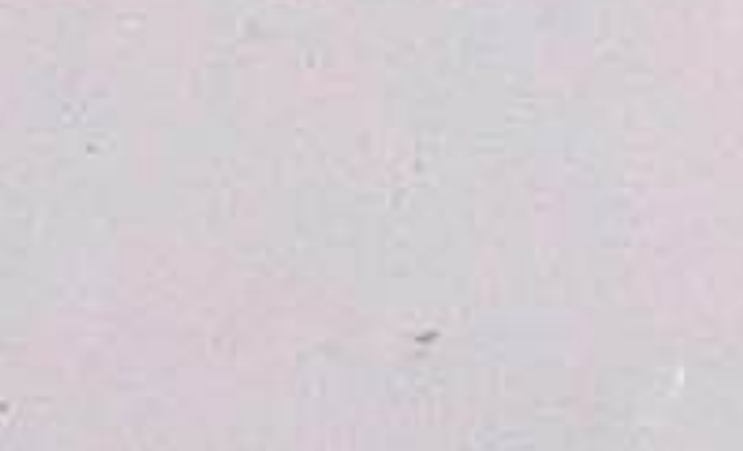

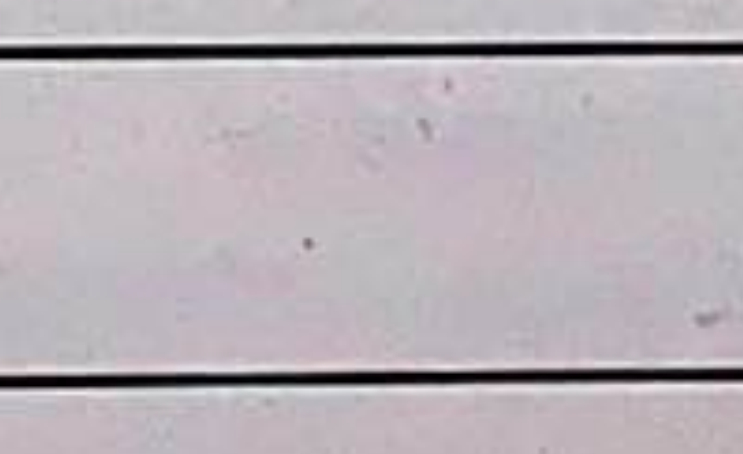
CFA: Patent, mod calcified disease, good triphasic waveforms, PSV 112cm/s.
PFA: Poorly visualised due to acoustic shadowing however origin appears patent with mod calcified disease, turbulent triphasic waveforms, PSV 220cm/s.
SFA: Patent prox-mid vessel with moderate diffuse calcified disease, slightly reduced monophasic waveforms, PSV 61-93cm/s. No flow identified in the mid vessel (55cm from MM) due to heavy calcification ?occluded, vessel appears to reform in mid-distal vessel (51cm from MM) via collateral flow with severe calcified disease, turbulent monophasic waveforms, PSV 367cm/s. Distal vessel is patent with mod calcified disease, reduced monophasic waveforms, PSV 31cm/s.
POPA: Patent, mild/mod calcified disease along its length, weak monophasic waveforms, PSV 39-40cm/s.
ATA: Patent with heavily calcified walls along length, reduced monophasic waveforms at the ankle, PSV 48cm/s.
PTA: No flow identified, ?occluded.
PerA: Poor views due to calcification ?full patency.

ABPI: Resting ABPIs reduced bilaterally.





Reason Routine
Outcome disease severe, Calcified, Significant disease indicated

Right	Left
<div>100 1.00</div> <div><div>Good</div></div>	<div>Brachial</div> <div><div>Turbulent</div><div></div></div>
<div><div>Good</div></div>	<div>Common Femoral</div> <div><div>Reduced</div><div></div></div>
<div><div>Absent</div></div>	<div>High Thigh</div> <div><div>Weak</div><div></div></div>
<div><div>Good</div><div>120 1.20</div></div>	<div>Low Thigh</div> <div><div>Reduced</div><div></div></div>
<div><div>Good</div></div>	<div>Popliteal</div> <div><div>Weak</div><div></div></div>
	<div>High Calf</div> <div><div>Reduced</div><div>86 0.86</div><div></div></div>
	<div>Peroneal</div> <div><div>Weak</div><div></div></div>
	<div>Anterior Tibial</div> <div><div>Weak</div><div></div></div>
	<div>Posterior Tibial</div> <div><div>Weak</div><div></div></div>
	<div>Dorsalis Pedis</div> <div><div>Weak</div><div></div></div>
	<div>Toe Pressure</div> <div></div>
	<div>Post Exercise</div> <div></div>

Notes

BILATERAL LOWER LIMB ARTERIAL DUPLEX SCAN

AORTA: Normal and uniform calibre with maximum inner-inner AP dimensions: TS plane: 1.56cm / LS plane: 1.48cm. Patent with mild calcified disease, good triphasic waveforms, PSV 38cm/s.

RIGHT:

CIA/EIA: Poor views, obscured due to bowel gas.

Assessed by David Barrett

Printed on 05/08/2022 at 4:29 pm

Checked by

CFA: Patent, mild/mod calcified disease with good triphasic waveforms, PSV 200cm/s.
PFA: Patent, mild calcified disease with good biphasic waveforms, PSV 56cm/s.
SFA: Patent, mild calcified disease along length, good biphasic waveforms, PSV 114-49cm/s. Patent through adductor canal.
POPA: Patent, mild calcified disease along length, good bi/triphasic waveforms, PSV 64-61cm/s. TPT appears patent, 2 vessel run off noted.
ATA: Patent, mild calcified disease along length, good biphasic waveforms at the ankle, PSV 52cm/s.
PTA: Patent, mild calcified disease along length, good biphasic waveforms at the ankle, PSV 85cm/s.
PerA: No flow identified ?patency.

LEFT:

CIA/EIA: Poor views, obscured due to bowel gas.

CFA: Severe calcified disease noted with velocities increasing from PSV 111cm/s to PSV 468cm/s in the mid vessel, turbulent monophasic waveforms.
PFA: Patent, mild calcified disease with reduced monophasic waveforms, PSV 34cm/s.
SFA: Patent, moderate calcified disease proximally with turbulent monophasic waveforms, PSV 285cm/s. Patent in mid-distal vessel with mild calcified disease, slightly reduced biphasic waveforms, PSV 93-65cm/s. Patent through adductor canal.
POPA: Patent with mod calcified disease along length, reduced monophasic waveforms, PSV 40-47cm/s. TPT appears patent with 3 vessel run off.
ATA: Patent, mild calcified disease along length, reduced/weak monophasic waveforms at the ankle, PSV 52-23cm/s.
PTA: Patent, mild calcified disease along length, weak monophasic waveforms at the ankle, PSV 29cm/s.
PerA: Patent, mild calcified disease along length, weak monophasic waveforms at the ankle, PSV 25cm/s.

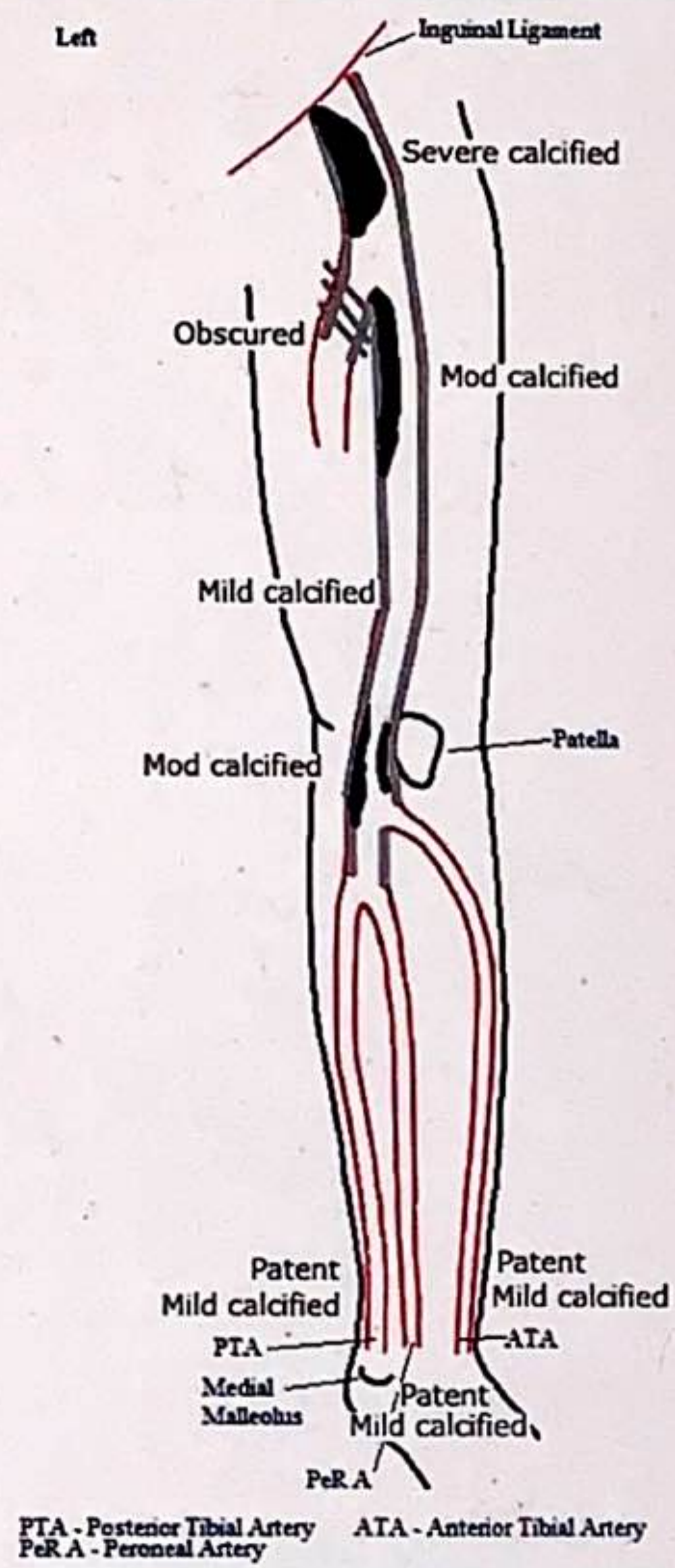
ABPI:

Right resting ABPI within normal limits.

Left resting ABPI slightly reduced ?accuracy due to calcified calf vessels.

Conclusion: Evidence of significant left lower limb arterial disease.

Suggest vascular surgical opinion.



Reason	Routine
Outcome	Stenosis moderate, Stenosis severe, Significant disease

Right

120	1.00
-----	------

Brachial

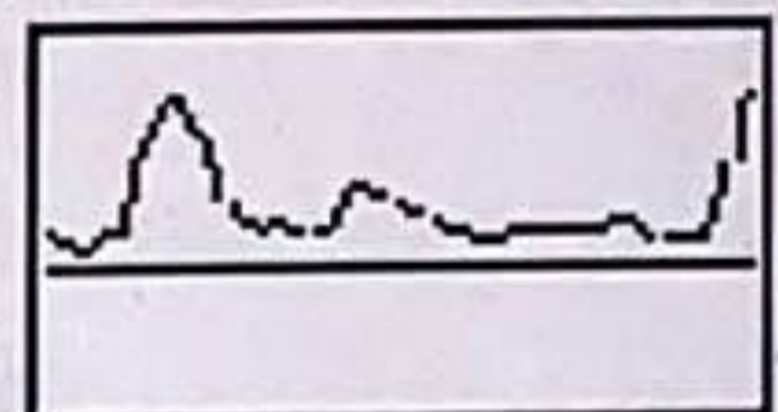
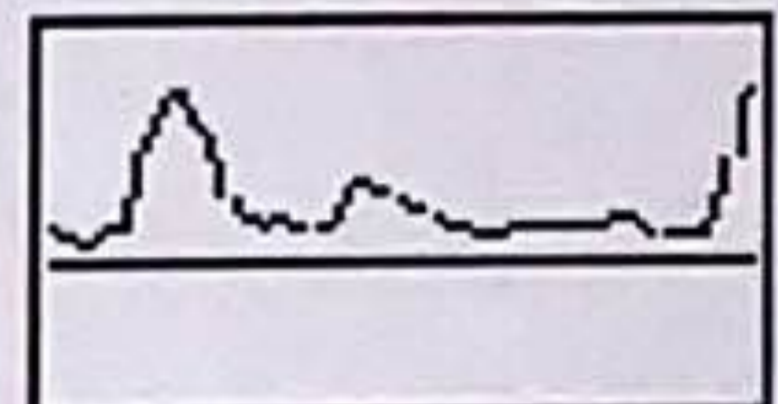
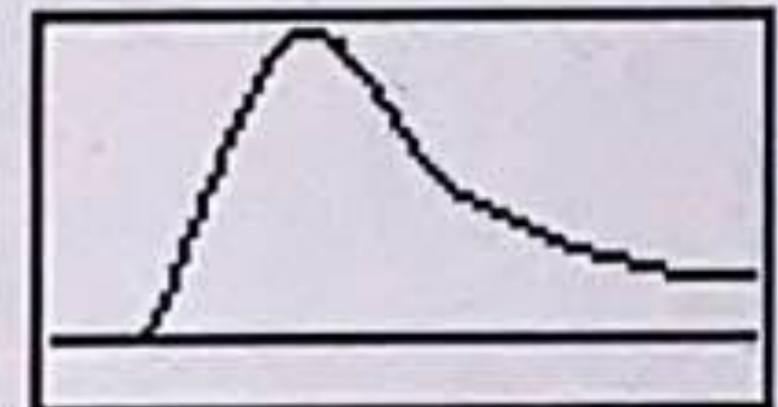
Reduced

Radial

Reduced

Ulnar

Reduced

Left**Post Exercise****Notes****LEFT UPPER LIMB ARTERIAL DUPLEX ASSESSMENT**

VertA: Open with orthograde flow.

CCA: Widely patent, good monophasic flow, PSV 92cm/s.

SCA: Widely patent along length, good triphasic waveforms, PSV 206-78cm/s.

AxA: Hypoechoic thickening noted in the prox-mid axillary artery forming a mod/severe stenosis with velocities increasing from PSV 103cm/s to PSV 675cm/s, falling to PSV 190cm/s distally.

Distal Axillary and brachial artery appear widely patent with reduced monophasic waveforms, PSV 38-28cm/s.

RadA: Widely patent at the wrist with reduced monophasic waveforms, PSV 21cm/s.

UlnarA: Widely patent at the wrist with reduced monophasic waveforms, PSV 22cm/s.

RIGHT

RadA/UlnarA: Widely patent, good triphasic waveforms at the wrist PSV 66-59cm/s.

Right brachial pressure: 120mmHg.

Left brachial pressure: 100mmHg.

Evidence of left mod/severe axillary stenosis identified from this scan ?due to vasculitis.

CL1.6

6. Lower limb arterial duplex/graft surveillance/angioplasty(stent) surveillance –

a) Thigh arteries

Probe types – 12-3 MHz linear array^{2,4,6}.

Measurements – velocities in centimetres per second, diameter (anterior-posterior AP, medial-lateral ML) in centimetres, length of disease in centimetres^{1,2}.

Patient lies supine^{1,7}. Due to the intimate nature of the scan, a chaperone should be offered²⁵.

The common femoral artery is visualised in the groin and followed proximal to the inguinal ligament^{1,2}.

The common femoral artery is then traced distally to the bifurcation and the profunda femoris and superficial femoral arteries are identified. The superficial femoral is traced along its length and through the adductor canal, visualisation is improved by flexing the leg at the knee to a 45 degree angle and turning the knee outwards^{1,2,7}.

Peak velocity readings and waveform shape and quality are recorded in the common femoral, at the profunda origin and at the superficial femoral origin, and at the proximal, mid and distal SFA^{2,8}.

If an area of stenosis is identified a peak velocity reading is taken immediately proximal, within and immediately distal to the diseased section. The colourflow and Doppler assessments are used to decide whether the disease is a stenosis or complete occlusion. The disease length and the distance from the medial malleolus is recorded. Any collateral vessels are noted. It should be stated whether the disease appears acute or chronic. It should be made clear in the report whether the distal superficial femoral reforms a disease free segment above the knee^{7,8}.

If there is a significant stenosis present, measure the maximum PSV through the stenosis (V2) and the PSV just proximal to the stenosis as a "normal" reference velocity (V1), to enable calculation of the velocity ratio V2/V1. Note that at the SFA and PFA origins it may not be possible to obtain a V1 measurement; the absolute PSV will then be used to grade the % stenosis. If within the SFA, mark the position and length of any significant stenosis with a single-use surgical marker pen and measure the distance to the medial malleolus^{3,5}.

Also remember to scan contralateral CFA when performing lower limb arterial assessments. In addition to our standard protocol if a patient has an iliac occlusion/severe disease (CIA, EIA or both) please scan contralateral iliac system. This may save the patient coming to VSU twice and speeds up the whole patient management process⁹.

For assessment of the popliteal artery, the patient sits with legs dependent or lies flat with the leg slightly flexed at the knee and externally rotated^{1,2}. Alternatively, having the patient lie on their side can allow a good view of the popliteal artery.

The popliteal artery is identified behind the knee and traced proximally ensuring that the full length of artery through the adductor canal is visualised and assessed^{2,5}.

The first arterial branch of the trifurcation is the anterior tibial (may not be viewed). The tibio-peroneal trunk is traced into the upper calf until it bifurcates into the posterior tibial and peroneal arteries. Waveforms are recorded and the velocities are measured in the popliteal and at each of the run-off artery origins and in any area where a stenosis is identified^{2,11,12}. The number of run-off vessels viewed should be documented (0-3).

Velocity ratios:

Comparing Peak Systolic Velocity (PSV) in reference segment proximal to lesion (V1) with maximum stenotic jet PSV (V2) gives a V2:V1 ratio (namely V2/V1) which can be used as follows^{1,2,10,27,28,29}:

Classification (diameter reduction)	Velocity Ratio	Disease level
0-49%	<2.0	Mild
50-74%	≥2.0	Moderate
75-99%	≥4.0	Severe

Absolute velocities:

For use when it is not possible to obtain a suitable reference V1:²⁴

artery	mean PSV (cm/s)	SD (cm/s)
Aorta	76	17
CIA	111	17
EIA	112	49
CFA	90	41
SFA prox	89	23
SFA mid	83	25
SFA distal	74	21
Popliteal	59	12

- ! The above table shows peak systolic velocities for normal legs.
- ! For a normal distribution, 99% of observations will fall within the range of the mean +/- 2 standard deviations.

For example, if the iliac arteries are largely obscured by bowel gas, but an isolated section of flow is seen in the EIA with a velocity of 300cm/s we can suggest that significant disease is likely. Using the mean velocity in the table above as V1, we can use the same ratio criteria to stratify the severity of disease, e.g. ≥4 would indicate severe disease.

Ankle brachial pressure indices are performed. (See Peripheral waveform assessment)

b) Calf arteries – Calf vessels should be scanned along their length²⁶.

Probe types – 12-3 MHz linear array/ if needed – 5-1 MHz curved array^{2,4}

Measurements – velocities in centimetres per second, length of disease in centimetres^{1,5}.

Patient lies supine or sits on the edge of the bed with their legs dependent (aids visualisation with severe disease, and allows venous filling which can be used to map the course of the arteries)².

The posterior tibial artery is identified posterior to the medial malleolus and is traced proximally. The peroneal artery is visualised deep to the posterior tibial artery (both arteries can be assessed throughout the length of the calf). If unable to visualise the peroneal artery with 12-3MHz – then you must try the 2-5 curved array, or attempt to view from an anterior approach^{2,12,13}.

The anterior tibial artery is identified on the antero-lateral aspect of the ankle (do not apply too much pressure as the artery may be occluded by the transducer) and should be traced to the upper calf^{12,13}.

Velocities and waveforms are recorded from all the calf arteries at the ankle and proximal calf and also at any site of stenosis.

In the presence of proximal disease, calf velocities can be unreliable and disease should be graded mild, moderate, severe or occluded^{1,8}.

c) Prosthetic grafts (usually above knee femoro-popliteal, aorto-bifemoral grafts (ABG), fem-fem crossover).

Probe types – 5-1 MHz curved array, 12- 3 MHz linear array^{2,14}.

Measurements – velocities in centimetres per second, diameter (anterior-posterior AP, medial-lateral ML) in centimetres, length of disease in centimetres^{1,2}.

Similar scanning protocols as above, except only the segments just proximal, mid and distal to the grafts are assessed. Particular attention is paid to the proximal and distal anastomosis where waveform shapes and velocities are recorded. ABPI are taken to assess any disease progression in non-treated segments (patient has usually had a full assessment prior to surgery)^{16,17}.

With fem-fem crossover grafts it is important to record the direction of flow through the graft^{1,2,18}.

With ABG and fem-fem crossover grafts, the common femoral waveforms are recorded^{1,2,18}.



Waveforms, peak velocities, ABPIs and any areas of re-stenosis/new disease are recorded¹⁷.

d) Vein grafts (usually below knee)

Probe types – 12-3MHz linear array².

Measurements – velocities in centimetres per second, diameter (anterior-posterior AP, medial-lateral ML) in centimetres, length of disease in centimetres^{1,2}.

Similar scanning protocols to above, except only the segments just proximal, mid and distal to the grafts are assessed. Care is taken to scan the length of the graft and velocities and waveforms are recorded at areas of stenosis (usually valve cusps). Waveforms, peak velocities, ABPI and any areas of re-stenosis/new disease are recorded. Avoid taking ABPI on fem-distal grafts as inflating the cuff leads to danger of occluding the graft^{2,19,20}.

If peak velocity is less than 45cm/s - graft is probably at risk of failure and this must be noted in the report².

e) Stent/angioplasty assessment

Probe types – 12-3 MHz linear array^{4,6}.

Measurements – velocities in centimetres per second, diameter (anterior-posterior AP, medial-lateral ML) in centimetres, length of disease in centimetres^{1,2}.

Similar scanning protocol to above. Care is taken particularly at the just proximal to, mid and just distal to the stent/angioplasty site. Waveforms, peak velocities, ABPIs and any areas of re-stenosis/new disease are recorded^{2,20}.

f) Pseudo-aneurysm diagnosis and compression.

Probe types – 12-3 MHz linear array^{4,6}.

Measure site of the feeder jet from the femoral bifurcation – if jet lies at or within 1cm of the bifurcation the pseudo-aneurysm will be usually be suitable for compression. The size of the sac must be measured in LS and TS, this is particularly important if the management results in thrombin injection as the radiologist will judge how much to use based on the size of the sac.

Suitability for compression depends on the position and width of the jet: the wider the jet the less likely it is going to successfully compressed. If the pseudo-aneurysm lies directly above the jet it will make it difficult to compress, the deeper the aneurysm i.e. if it originates off the posterior wall again it will be difficult to compress^{1,2,21,22}.

The dimensions of the pseudo-aneurysm must be recorded – length, AP and ML²¹.



If no colourflow is seen filling a pseudo-aneurysm but there is evidence of fresh haematoma the report should state “no evidence of patent pseudo-aneurysm but areas of fresh haematoma noted, cannot exclude a thrombosed pseudo-aneurysm or slow bleed”.

If the pseudo-aneurysm is deemed to be suitable for compression then it is necessary to arrange for the patient to come down on their bed. The patient may require analgesics as the compression can cause significant discomfort – the SHO/HO needs to supply and if necessary administer the pain relief.

Using the L7-5 probe, the vascular scientist needs to apply pressure over the jet of the pseudo-aneurysm and should attempt to occlude it. The first compression should last 10 minutes and the circulation should be checked with a hand held Doppler at the ankle to ensure patency. After 10 minutes the pseudo-aneurysm needs to be checked to see if it is thrombosed or partially thrombosed. If still patent further compressions of 10 minutes need to be performed, up to a maximum of three sessions. If after the third session the pseudo-aneurysm is still patent then the patient should be referred to interventional radiologist for thrombin injection.

If the pseudo-aneurysm has thrombosed then we need to rescan the patient the next day to ensure it remains occluded^{2,22,23}.

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