LOWER LIMB ARTERIAL ASSESSMENT

SCANNER SETTING: Arterial

PROBES:

PATIENT POSITION

Supine with support for head and neck.

DISEASE GRADING

Three factors are used to grade atheroma when scanning, appearance on ultrasound, colour flow and spectral Doppler waveform analysis.

Normal: - Walls of vessels should be smooth with intima seen but may have first signs of atheroma with fatty streaks or calcification within the wall. Colour flow should be uniform to the walls of the vessel. The Doppler waveform should be tri-phasic with clear definition of frequencies.

Minor/mild: - Irregular walls to the vessel due to atheroma causing less than 30% diameter reduction, with some colour flow disturbance. The Doppler waveform may exhibit some flow disturbance with spectral broadening and may still be bi-phasic but giving less than 2 times increase in Peak Systolic Velocity (PSV).

Significant: - Atheroma clearly evident causing significant reduction in diameter. Significant colour flow disturbance with aliasing. Localised mild stenoses may still have bi-phasic Doppler waveforms post stenosis, but causing at least 2 times increase in PSV. The more severe the stenosis the more damped and mono-phasic the Doppler waveform post stenosis. Distal to the area of significant disease the Doppler waveform may still be pulsatile but mono-phasic.

Severe: - Heavily congested with atheroma to the extent that it may appear occluded without the use of colour flow Doppler. Severe disease may be multiple tight stenoses or a long stenosis with just a residual lumen. Colour flow Doppler will help to distinguish this. Distal to the area of severe atheroma the Doppler waveform will be very damped and mono-phasic.

IC April 2012

Occluded: - Atheroma throughout and may appear small in calibre due to age of disease. No colour flow Doppler or Doppler waveforms detected.

Stenosis grading: - Calculating increase in PSV's is performed by measuring the PSV just proximal to the stenosis in a preferably disease free area or area of minimal disease. A PSV is then measured in the jet of the stenosis. The stenosis PSV is then divided by the proximal PSV to obtain a ratio. 2 to 3 times increase is a mild stenosis and >3 times increase in PSV significant.

IMAGES AND REPORTING:

When obtaining images ensure that the correct side and site is recorded. Note any abnormalities or incidental findings. For reporting purposes split the SFA into proximal, mid and distal thirds. For each segment from the CFA to the popliteal artery measure the diameter of the vessel and in the presence of atheroma measure the lumen diameter (unless there is stenoses of =>3x PSV). Obtain images as necessary with descriptive text of what was seen and when assessing stenoses. Assess level of calcification as whether in walls only or heavily calcified plaque. When possible assess the type of plaque. Measure the length of any occlusions and if short (<10cm) location in segment.

SCANNING TECHNIQUE

Al segment

- 1. Start in a transverse view in B-mode, along the midline just above the level of the umbilicus. Identify the Abdominal aorta and IVC. To help identify the Abdominal aorta look for the SMA origin and also the bifurcation.
- Assess for aneurysmal disease by scanning the length of the abdominal aorta. Identify the bifurcation, assessing for aneurysmal disease and noting the orientation of the CIAs.
- Obtain measurements of the AP diameters of the Abdominal aorta and CIA's in longitudinal view ensuring the walls of the vessels are clearly defined.
- 4. Switch on the colour Doppler and repeat the scan looking for any flow disturbance or aliasing along the lengths of the aorta, CIAs and EIAs. If present assess with the pulsed Doppler, grading any disease present.

Femoral - Populate at segment

- 1. At the level of the inguinal ligament place the probe in a transverse plane. Identify the common-femoral artery and vein and the bifurcation into the superficial-femoral and profunda arteries. Assess the common-femoral artery throughout its length in transverse plane. If no stenotic atheroma obtain a Doppler waveform from the middle of the vessel.
- 2. If necessary return to a transverse view to identify the profunda artery. Assess the ressel as far as possible in the thigh and obtain a Doppler waveform.
- 3. Return to the bifurcation and identify the origin of the superficial-femoral artery. Assess the vestel throughout its length, flexing the knee and externally totating it as necessary. Obtain Doppler waveforms from the proximal and distal segments.
- With the probe in a transverse view, identify the popliteal artery from behind the knee in the popliteal fossa. Assess the vessel throughout it's length in a tengitudinal view by scanning proximally ensuring overlap with the distal SFAtactductor scan and then scan distally to identify the tibio-peroneal trunk. Obtain a Departer waveform from the distal popliteal artery.

Tibial segment

- 1. Identify the origins of each of the tibial vessels and assess with the pulsed Doppler obtaining images from each.
- 2. Whilst in longitudinal view follow the posterior tibial artery from the tibio-peroneal trunk, distally to the level of the malleoli along the medial aspect of the tibia. Assess with pulsed Doppler as necessary and obtaining images. To add in the identification ensure the posterior tibial runs to the medial malleolus, if necessary start scan of PT from malleolus.
- 3. Return to the this operoneal trunk and assess the peroneal artery throughout it's length to the ankle. The peroneal artery lies deep to the posterior tibial artery in medial view and also deep to the anterior tibial in lateral view.
- 4. Assess the anterior-tibial artery on the anterio-lateral aspect of the lower leg throughout it's tength and that it feeds the dorsalis pedis directly.

IC April 2012

5. If there is severe disease demonstrated proximally take AP diameter measurements of the patent tibial arteries proximally and distally.

Arterial

Date	CHI	Scan
14/11/2018	1.55(2)(233))	LLLA (Fem -pop and calf)
15/11/2018	604502230	
21/11/2018	1411452313	LLLA
21/11/2018	804442053	LLLA
21/11/2018	191031111	BLLA
27/11/2018	202322084	LLLA
13/12/2018	1905402015	LLLA
13/12/2018	1401482058	LLLA
18/12/2018	801525233	RLLA
18/12/2018	308325257	BLLA
18/12/2018	211442003	LLLA
31/12/2018	2112502190	LLLA
08/01/2019	1212442121	LLLA
22/01/2019	1906412146	LLLA
23/01/2019	1302392034	BLLA
23/01/2019		LLLA fem - (pop ATA and PTA)
29/01/2019	3108322125	LLLA (Fem -pop and calf)
06/02/2019	3107352055	LLLA
11/02/2019	2212372159	RLLA
11/02/2019	302512136	BLLA

Consultant:

Vascular Surgeon

Ward 215

Episode date 14/11/2018

Ward Outpatient

Patient:

Mr.

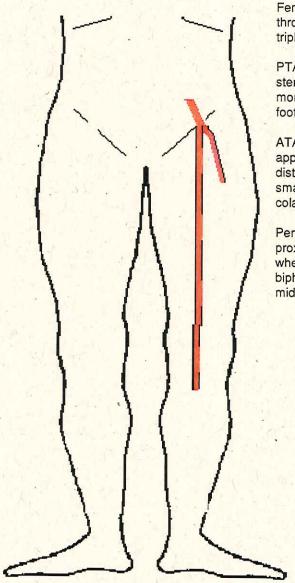
Unit Number 0609278

CHI

0409702110

Tests performed: **Left Leg Arterial Duplex**

Results:



Fem - pop - heavily calcified throughout with a sharp triphasic waveform.

PTA is calcified with muliple stenosis and a sharp monophasic waveform at the foot.

ATA is difficult to asses. it appears to be nearily occluded distally howver there was a small well established colateral.

Peroneal can be seen from the proximal segement to 2/3 calf where it appears to occlude. biphasic waveform seen at mid calf.

Scanned By:- Heather Lynn Trainee Clinical Scientist

14/11/2018

101701

Consultant:

Episode date 15/11/2018

Ward Outpatient

Patient:
Mr. Mibkish Tallin

Unit Number 060450

CHI 0604502230

Tests performed: Bilateral Arterial Legs Duplex

Results:

Aorta - size appears within normal limits moderate disease at the CIA/EIA and ICA bifurcation.

CFA - mild/moderate disease with a biphasic doppler waveform.

Profunda - moderate diffused disease however well established.

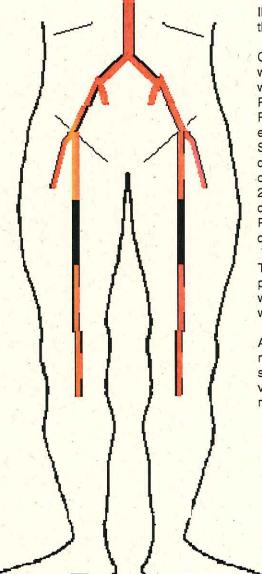
SFA - proximally moderate disease at 1/4 thigh the vessel occluded and reconstitutes at 2/3 thigh. there was moderate disease distally.

Popliteal calcified moderate disease.

PTA - calcified and small in calibre, flkow was seen from the origin to 2/3rds calf, distally no flow detected.

peroneal not imaged ?occlusion/calcified.

ATA - Mild calcified with a



Iliac moderate disease throughout.

CFA - mild/moderate disease with a biphasic doppler waveform.

Profunda - proximal stenosis PSV's 310cm/sec and is well established.

SFA - proximally moderate disease at 1/4 thigh the vessel occluded and reconstitutes at 2/3 thigh. there was moderate disease distally.

Popliteal calcified moderate disease.

The PTA and peroneal are patent and calcified throughout with a damped monophasic waveform at the foot.

ATA - open proixmally, could not be imaged in the mid segment however distally the vessel is patent damped monophaisc.

Scanned By:- Heather Lynn Trainee Clinical Scientist

15/11/2018

101713

Consultant: Vascular Surgeon

Episode date 21/11/2018 Ward 215 ARI

Ward Outpatient

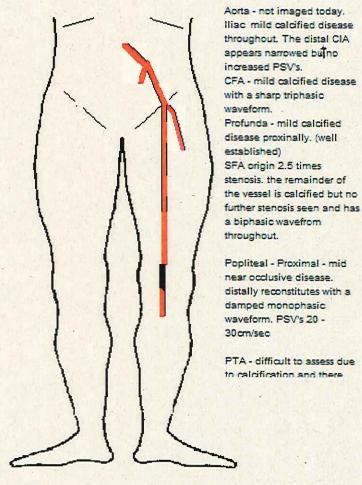
Mr.

Unit Number 2155604

CHI 1411452313

Tests performed: Left Leg Arterial Duplex

Results:



Heather Lynn Trainee Clinical Scientist

07/12/2018

101772



Return



Episode date 21/11/2018

Ward Outpatient

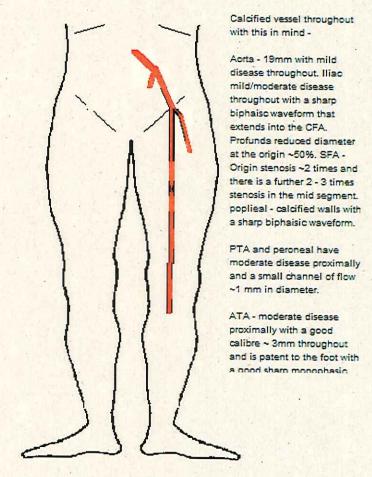


Unit Number 0968456

0804442053

Tests performed: Left Leg Arterial Duplex

Results:



Heather Lynn Trainee Clinical Scientist

27/11/2018

101773

Consultant:

Episode date

21/11/2018

Ward Outpatient

Patient:

Mr. Rousin Sangator

Unit Number 0203360

CHI

1910311111

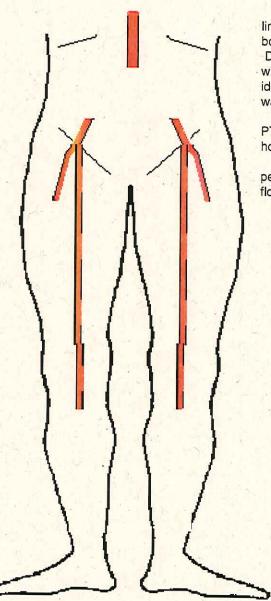
Tests performed: Bilateral Arterial Legs Duplex

Results:

aorta - 19mm. limited view of iliac due to bowel gas.
Diffused disease throughout with no significant stenosis identified with a tri/biphasic waveform.

PTA - calcified and unable to show flow.

ATA - calcfied with a 4 times stenosis proximally.



limited view of iliac due to bowel gas.

Diffused disease throughout with no significant stenosis identified with a tri/biphasic waveform.

PTA and ATA are calcified however patent.

peroneal - calcified with no flow detected.

Scanned By:- Heather Lynn Trainee Clinical Scientist

21/11/2018

101767

Consultant: Vascular Surgeon
Ward 215 ARI

Episode date 27/11/2018

Ward Outpatient

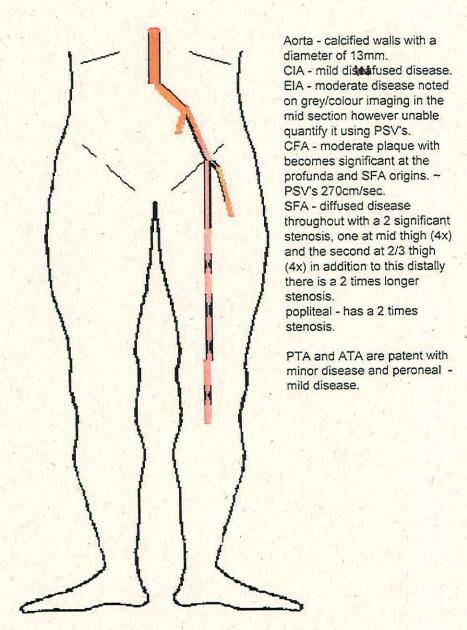
Patient:

Unit Number 0309901

CHI 0202322084

Tests performed: Left Leg Arterial Duplex

Results:



Scanned By:- Heather Lynn Trainee Clinical Scientist

27/11/2018

101823

Consultant:

Mr Haider

Episode date 13/12/2018

Ward
Outpatient

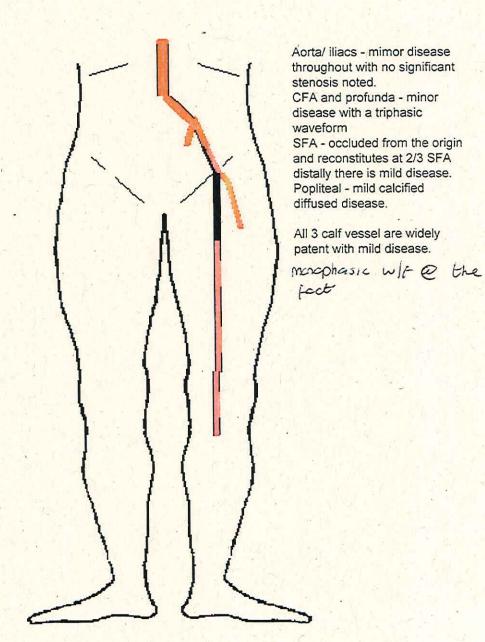
Patient:

Unit Number 0492128

CHI 1905402015

Tests performed: Left Leg Arterial Duplex

Results:



Consultant:

Episode date 13/12/2018 Ward Outpatient

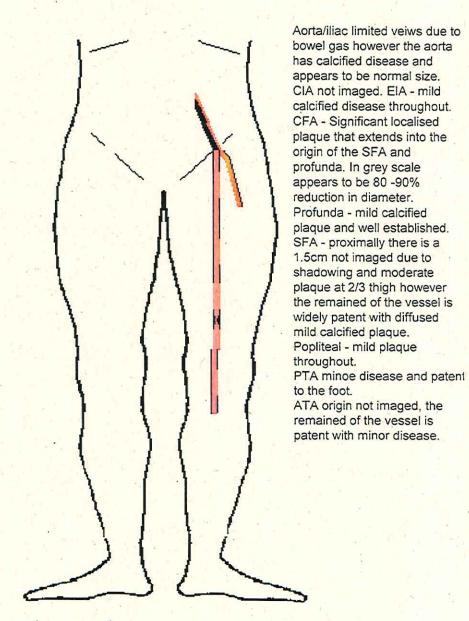
Patient:

Tests performed: Left Leg Arterial Duplex

Unit Number 0387718

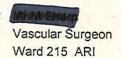
1401482058

Results:



Scanned By:- Heather Lynntynnhe 13/12/2016 Trainee Clinical Scientist

Consultant:



Episode date 18/12/2018 Ward Outpatient

Patient:

Unit Number 2216029

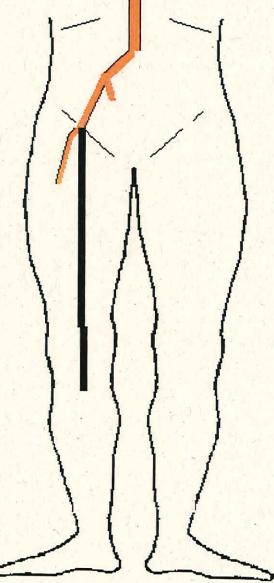
0801525233

Tests performed: Right Leg Arterial Duplex

Results:

3mm.

Aorta - appears within normal size (20mm). The aorta was difficult to image. iliac section has diffused plaque throughout and could not detect significant disease. CFA - moderate calcified plaque with a sharp triphaisc waveform throughout. Prfunda well established with mild dpalque. SFA proximal appears aneurysmal measuring 1.3mm compared to 0.9mm, the remained of the SFA is occluded. The popliteal is also occluded. PTA/ATA origin not seen however both vessel are widely patent. PTA at 1/3 ~



Scanned By:- Heather Lynn Trainee Clinical Scientist

18/12/2018

102053

Return

Consultant:



ergeen Royal Infirma

Episode date Ward 18/12/2018 Outpatient

Patient: Wei Britagis at Epitus Unit Number 1236252 CHI 0308325257

Tests performed: Bilateral Arterial Legs Duplex

Results:

Aorta - 46mm, Iliac calcified and tortuous with a right angle bend in the CIA. CFA - mild disease throughout Profunda well established mild disease. SFA - mild diffused disease with a localised 2 times stenosis at mid thigh. Popliteal moderate calcified with a biphasic wavefrom seen throughout.

calf vessel difficult to image due to swelling and calcification with this in mind the ATA is not in continuity.

PTA could not be imaged fully however sharp monophasic wavefrom was seen at the foot.

Peroneal narrowed but appears patent.

lliacs mild calcified disease and tortuous.

CFA, Profunda and SFA mild calcified disease with a sharp tri/biphaisic waveform seen throughout Popliteal moderate disease with a 2 times stenosis in the mid section.

ATA widely patent with a sharp monophasic wavefrom seen throughout.

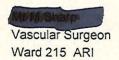
PTA and peroneal not imaged.

Heather Lynn/Is Trainee Clinical Scientist

18/12/2018

102064

Consultant:



Episode date 18/12/2018 Ward Outpatient

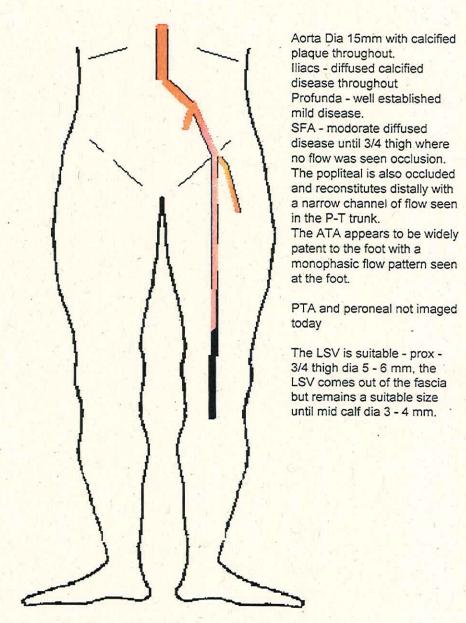
Patient:

Unit Number 0101023

0211442003

Tests performed: Left Leg Arterial Duplex

Results:



Scanned By:- Heather Lynn Trainee Clinical Scientist

18/12/2018

102054

Consultant:

Episode date 31/12/2018

Ward Outpatient

Patient:

Mr. Ernest-Miline

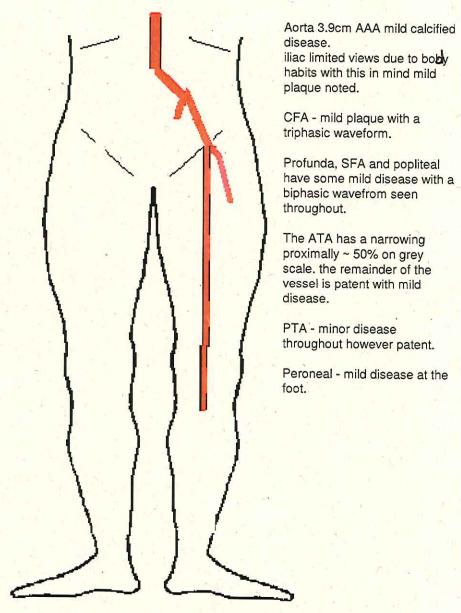
Unit Number 0480398

CHI

2112502190

Tests performed: Left Leg Arterial Duplex

Results:



Scanned By:- Heather Lynn Trainee Clinical Scientist

31/12/2018

102160

Consultant:

Return

Vascular Surgeon Ward 215 ARI

Episode date 08/01/2019 Ward Outpatient

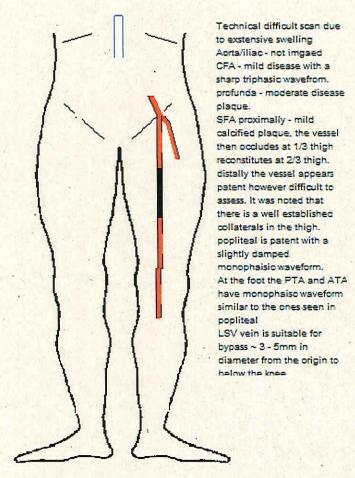
Patient:

Unit Number 0240547

1212442121

Tests performed: Left Leg Arterial Duplex

Results:



Heather Lynn Trainee Clinical Scientist

08/01/2019

102220

Consultant:

Episode date 17/01/2019

Ward Outpatient

Patient:

John Suthertunit

Unit Number 2025910

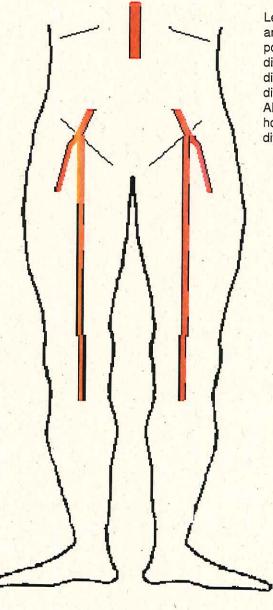
CHI

1301442151

Tests performed: Bilateral Arterial Legs Duplex

Results:

Right - There was no aneurysms detected in the aorta or popliteal. Iliac mild calcified disease throughout. The Fem - pop segment had mild diffused calcified disease with a sharp biphasic waveform seen throughout. PTA - patent to the foot with mild calcified disease. ATA - prox - 3/4 calf the vessel is patent with mild calcified disease. At 3/4 there is a short occlusion and distally there is a monophasic waveform with PSV's 20cm/sec

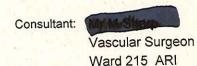


Left - There was no aneurysms detected in the popliteal. Iliacs only seen distally with mild calcified disease. Fem - pop minor diffused disease throughout. All 3 calf vessel are patent however appear narrowed with diffused disease throughout

Scanned By:- Heather Lynn Trainee Clinical Scientist

17/01/2019

102352



Episode date 22/01/2019

Ward Outpatient

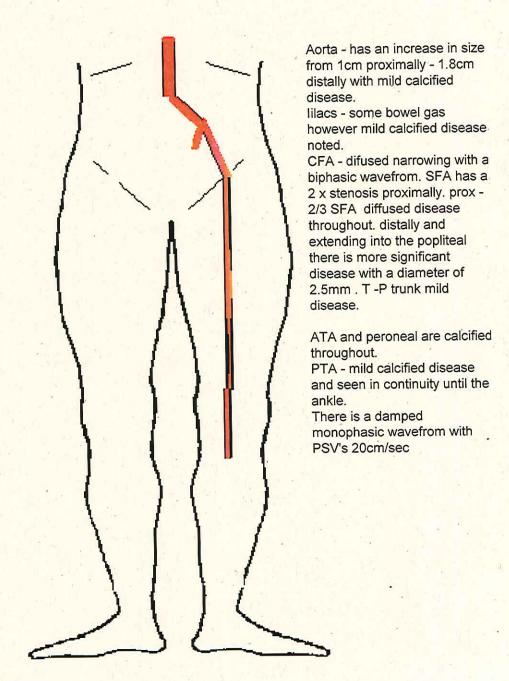
Patient:

Unit Number 0130707

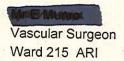
1906 41 2146

Tests performed: Left Leg Arterial Duplex

Results:



Consultant:



Episode date 23/01/2019

Ward Outpatient

Patient:



Unit Number 0380070

CHI

1302392034

Tests performed: Bilateral Arterial Legs Duplex

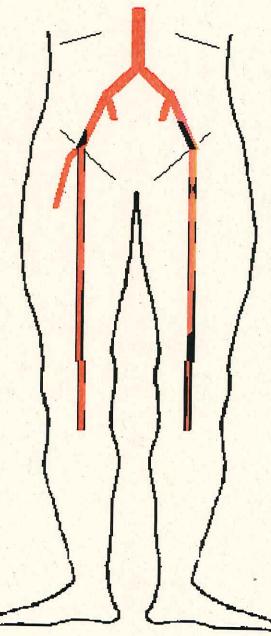
Results:

Enlarged lymph nodes
Aorta - dia 1.5 cm and mild
calcified walls.
Iliac - mild calcified disease
throughout.
CFA shape biphasic waveform
with moderate calcified
disease which includes a 50%
reduction in diameter caused
by localised plaque proximally.

Profunda - mild palque SFA - Prox - mild diffused mild calcified plaque with becomes more significanytt distally howevr maintains a sharp biphaisic wavefrom throughout. popliteal moderate disease. P - T trunk Mild plaque Peroneal appears patent however very narrow ~dia 1mm. PTA - patent with calcified

doppler waveform seen throughout.
ATA - could not show in continuity possible occlusion at mid calf and distally.

disease with a biphasic



Iliac - mild calcified disease throughout.
CFA shape biphasic waveform

CFA shape biphasic waveform with moderate calcified disease.

SFA moderate calcified disease throughout with a 50% reduction in diameter at 1/3 thigh and at 2/3 thigh there is signifiacnt disease with a distally near occlusion which extents into the proximal popliteal. Popliteal significant plaque with flow detected in the mid segment and distally. Calf vessel heavily calcified the PTA with flow detected in teh prox, mid and distal segment PSV's 20cm/sec. ATA - distal occlusion. peroneal not imaged

Consultant:

Episode date 23/01/2019

Ward Outpatient

Patient:

Unit Number 1052243

CHI

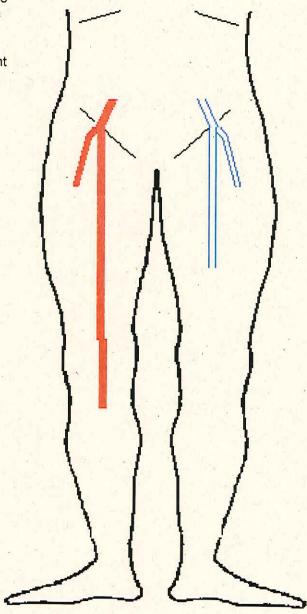
3103712510

Tests performed: Right Leg Arterial Duplex

Results:

Right - Fem - pop segment is patent with a sharp triphaisc wavefrom seen throughout.

The PTA and ATA are patent with a sharp triphaisc wavefrom seen throughout



Consultant:

WEAM Sharps

Vascular Surgeon
Ward 215 ARI

Episode date 29/01/2019

Ward Outpatient

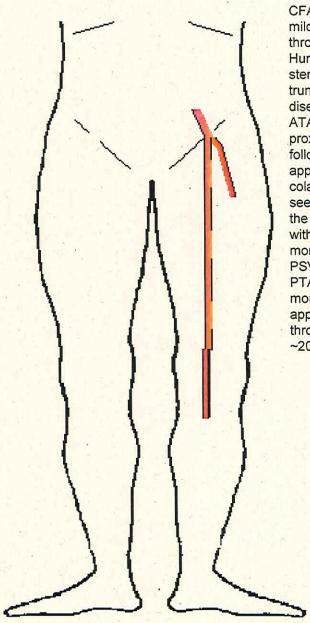
Patient:

Unit Number 0156471

3108322125

Tests performed: Left Leg Arterial Duplex

Results:



CFA, profunda and SFA have mild diffused disease throughout. Hunter cannal has a 3 x stenosis. the popliteal and p-t trunk has mild diffused disease.

ATA - significant disease proximally and could not be followed after 1/3 calf, there appears to be a network of colaterals. mid segemnet not seen due to ulcer. distally to the ulcer the vessel is patent with minor disease and a monophasic waveform with PSV's of 20cm/sec. PTA patent to the foot with a monophaisc waveform that appears to reduce in PSV's throughout with a PSV ~20cm/sec at the ankle

Consultant:

Vascular Surgeon Ward 215 ARI

Episode date 06/02/2019 Ward Outpatient

Patient:

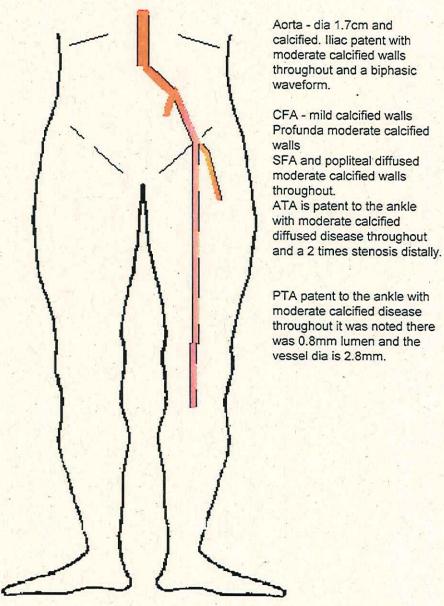
Unit Number 0567249

CHI

3107352055

Tests performed: **Left Leg Arterial Duplex**

Results:



Aorta - dia 1.7cm and calcified. Iliac patent with moderate calcified walls throughout and a biphasic waveform.

CFA - mild calcified walls Profunda moderate calcified SFA and popliteal diffused moderate calcified walls throughout. ATA is patent to the ankle with moderate calcified diffused disease throughout

PTA patent to the ankle with moderate calcified disease throughout it was noted there was 0.8mm lumen and the vessel dia is 2.8mm.

Scanned By:- Heather Lynn Trainee Clinical Scientist

06/02/2019

102557

Consultant:

Episode date 11/02/2019

Ward Outpatient

Patient:

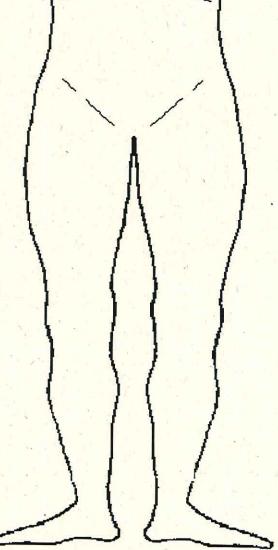
Tests performed: Right Leg Arterial Duplex

Unit Number 1128208

CHI 2212372159

Results:

Aorta - 19mm diameter calcified walls. CIA and EIA have calcified walls but no significant stensosi seen. CFA - calcified plaque throughout with biphasic waveforms Profunda well established with biphasic waveforms. SFA - calcified plaque throughout with multiple moderate stenosis and two 2 -3x times stenosis one at mid thigh and the second at 2/3 thigh. Popliteal/ P-T trunk - mild calcified walls. All calf vessel heavily calcified, the PTA is patent with a damped monophasic wavefrom seen at the foot. ATA not seen in continuity and has a significant stenosis proxinally.



Scanned By:- Heather Lynn Trainee Clinical Scientist

11/02/2019

102604

Consultant:

Episode date 11/02/2019

Ward Outpatient

Patient:

Mr. Alexander Ogilvie

Unit Number 0919449

СHI 0302512136

Tests performed: Bilateral Arterial Legs Duplex

Results:

Aorta - dia 1.7cm,
The iliac have limited image
due to bowel gas with this in
mid the CIA and EIA have
mild/moderate disease and a
narrow calibre.

CFA - monophasic waveform. Profunda is well established with a significant stenosis proximally, (PSV's 300cm/sec) SFA - moderate diffused disease throughout which becomes significant in the mid segment and is aided by a colateral. distally to this the signifiant diseae reamins with a dmaped monophasic waveform of 20cm/sec. popliteal proximally significant disease in the mid to distal segment there is mild disease.

The PTA and peroneal heavily calcified disease throughout. ATA - prox - mid significant calcified diease distally to this there is an ocluion which reconstitutes at 2/3 calf.

The iliac have limited image due to bowel gas with this in mid the CIA and EIA have mild/moderate disease and a narrow calibre.

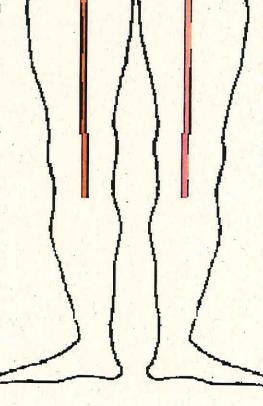
CFA - moderate disease throughout.

Profunda wellestablish with a significant disease proximally.

SFA - moderate disease which becomes significant in the mid section and occludes at 2/3.

SFA - moderate disease which becomes significant in the mid section and occludes at 2/3 and reconstitutes distally, Popliteal - proximally not imaged? occlusion distally moderate disease with a damped monophasic waveform.

ATA - heavily occluded with short occlusion proximally, PTA could not image? occlusion.



Scanned By:- Heather Lynn Trainee Clinical Scientist

11/02/2019

102596