CardioVascular

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VASCULAR STUDIES UNIT
Lower Limb Arterial – Doppler Ultrasound Examination

Introduction and Scope:
An ultrasound scan of the abdominal and lower limb arteries can be used to identify the presence of arterial disease, including atherosclerotic plaque, thrombus and aneurysms, among other abnormal arterial pathology, such as pseudoaneurysms and dissections.

Indications for examination
Indications for performing the examination include:

- claudication
- rest pain
- ulceration or non-healing wound
- ischaemia
- aneurysm
- pseudo aneurysm
- post-revascularisation
- gangrene
- arterial trauma

We should not perform this investigation for patients suffering with claudication unless revascularisation is being considered. Here, exercise ankle/toe brachial pressure index (ABPI/TBI) testing should be performed to document their symptomatology, as well as quantify their walking distance and level of disease.

Contraindications and limitations for scanning may include open wounds, obesity, bowel gas (aortoiliac arteries), casts, and dressings/bandaging where appropriate redressing is unavailable. Patients who are unable to cooperate due to cognitive function, such as dementia, involuntary movements, or due to reduced mobility meaning they cannot lay supine, may also be unsuitable for the examination.

Referral pathways:

- Routine referrals should be made by a member of the patient's care team via EPR. If an inpatient referral, the patient's care team must discuss with the Vascular Surgeons prior to scan request.
- Urgent referrals from the Emergency Department, vascular clinic and vascular surgeons should be made on EPR and followed up with a phone call to the Vascular Studies Laboratory (where possible this should be done while the patient is still in the hospital)

Version 2.0 – Approved by Ved Ramnani, Head Clinical Vascular Scientist
In use from 13/11/2023, due for review by 13/11/2025

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Contraindications and limitations for scanning may include open wounds, obesity, bowel gas (aortoiliac arteries), casts, and dressings/bandaging where appropriate redressing is unavailable. Patients who are unable to cooperate due to cognitive function, such as dementia, involuntary movements, or due to reduced mobility meaning they cannot lay supine, may also be unsuitable for the examination.

Referral pathways:

- Routine referrals should be made by a member of the patient's care team via EPR. If an inpatient referral, the patient's care team must discuss with the Vascular Surgeons prior to scan request.
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For patients with critical limb ischaemia (CLI) who may be a candidate for arterial bypass surgery, consider additional venous mapping (please see *'vein mapping/POM'* protocol for further information).

For patients with critical limb ischaemia (CLI) who may be a candidate for angioplasty and who have ipsilateral common femoral artery (CFA) calcification or >50% atherosclerotic disease, consider scanning the contralateral CFA to aid decision making for angioplasty access.

Measurements and Grading Criteria [5,6,7,8,9]:

- Where changes in velocities are identified the degree of stenosis is graded by measuring the maximum peak systolic velocity (PSV) proximal to and within the stenotic region. The ratio between these two measurements is then used to grade the degree of stenosis as per below criteria (Table 1.).

Table 1. Criteria for lower limb artery duplex examination

PSV ratio	% Stenosis
< 2	< 50%
≥2<4	50-74%
≥4	75-99%
Absence of flow	*Occluded*

- Grading criteria of aorto-iliac arteries is less well established. It is at the discretion of the CVS to use the above criteria as a guideline when grading aorto-iliac lesions. Haemodynamic changes and B-mode information should be incorporated into the grading of stenosis.
- Where normal velocity criteria cannot be applied (e.g. in the presence of shadowing or immediately after bifurcations) qualitative descriptions of haemodynamic waveforms should be provided along with their possible clinical causes.
- Qualitative descriptions of waveform changes should be accompanied by explanation of their likely haemodynamic cause.
- Where aneurysms are noted please refer to the *'Aorto-iliac Aneurysm'* protocol for information on accurate measurement and grading.
- For infrainguinal arteries, aneurysms are defined as 1.5 times the adjacent normal diameter. Thresholds for intervention of common femoral and popliteal artery aneurysms are 3.5 cm and 3.0 cm, respectively.

Reporting:

Images documenting any disease, as well as images including waveforms (unless occluded) of each of the examined arteries should be stored on PACS.

All reports should include the severity and location of any arterial stenosis/occlusions identified, and the size and location of any focal ectasia/aneurysm.

The report must answer the questions raised in the referral, for example, the location and size of a ?pseudoaneurysm.

The report should be made available on EPR. This may be accompanied by a diagram to illustrate the findings, which should be uploaded to EPR. A comment in the written report should direct the reader to any diagram produced as part of the report.

Urgent findings must be reported verbally to the vascular team on call via bleep 2977 and also to the referring clinical team if not a vascular referral.

Urgent findings include newly found acute thrombus, dissection or pseudoaneurysm. Incidental finding of an aneurysm exceeding the threshold for intervention should also be urgently escalated if the patient is not attending clinic for same day follow up.

References:

[1] United Kingdom Association of Sonographers (UKAS), 2008, Guidelines for Professional Working Standards Ultrasound Practice, accessed at: www.sor.org/learning/document-library

[2] Society of Radiographer, 2002, The Causes of Musculoskeletal Injury Amongst Sonographers in the UK Society of Radiographers, accessed at: www.sor.org/learning/document-library

[3]Society for Vascular Technology Professional Standards Committee, 2020, Consent and Chaperone Guidelines, accessed at: https://www.svtgbi.org.uk/media/resources/Chaperone_2020.pdf

[4] Department of Health and Social Care, 2013, Caldicott Review: information governance in health and social care, accessed at: https://www.gov.uk/government/publications/the-information-governance-review

[5] Thrush and Hartshorne (2010) Vascular Ultrasound: How, why and when. 3rd Edition. Chruchill Livingston Elsevier, UK

[6] Pozniak and Allan (2014) Clinical Doppler Ultrasound. 3rd Edition. Chruchill Livingston Elsevier, UK

[7] Sensier, Y., Hartshorne, T., Thrush, A., Nydahl, S., Bolia, A. and London, N.J.M., 1996. A prospective comparison of lower limb colour-coded duplex scanning with arteriography. *European journal of vascular and endovascular surgery*, *11*(2), pp.170-175.

US Doppler lower limb arteries Lt:

Clinical Indication: ?left iliac stent occluded, ?poor run off Clinical History: left leg short distance claudication. Weaker femoral pulse left leg.

Findings:

The infra-renal abdominal aorta is patent with triphasic flow. The common iliac (CIA) stent and prox to mid external iliac (EIA) arteries are patent with triphasic flow. The distal EIA is significantly calcified, with a prominent outflow collateral noted.

The common femoral artery (CFA) is chronically occluded. A heavily large calcified plaque at the distal CFA obscuring the view of the origin of the profunda femoral artery (PFA), however proximally the PFA is patent with monophasic flow.

The prox to mid superficial femoral artery (SFA) is chronically occluded. The SFA is heavily calcified. Flow reconstitutes in the mid SFA with a small channel of string like flow noted in the mid SFA before occluding again in the distal third of the thigh. Flow reconstitutes at the distal SFA with damped monophasic flow. The popliteal artery (POPA) is patent with monophasic waveforms detected throughout.

The tibio-peroneal trunk (TPT), posterior tibial artery (PTA), anterior tibial artery (ATA) and peroneal artery (PeroA) are all patent with damped monophasic waveforms detected throughout.

Study Date: 14/09/2023

Reported By:

Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

US Doppler lower limb arteries Lt:

Clinical Indication: function of the left leg angioplasty Clinical History: left leg angioplasty in august, admitted again with infected ulcer in left leg + rest pain, D/W Vascular SpR, for urgent arterial Doppler.

Findings:

The common femoral artery (CFA) is mildly calcified with triphasic flow. The prox profunda femoral artery (PFA) is mildly calcified with triphasic flow.

The superficial femoral artery (SFA) is significantly calcified with shadowing obscuring views of short segments. There are two 50-74% diffused stenosis detected in the proximal third and distal third of the thigh, however low resistant multiphasic flow maintained distally.

The popliteal artery (POPA) is moderately calcified and patent with multiphasic flow and no significant stenosis detected.

The proximal to mid posterior tibial artery (PTA) and peroneal artery (PeroA) are significantly calcified and patent with monophasic hyperaemic waveforms. The prox to mid anterior tibial artery and dorsalis pedis artery are moderately calcified and patent with monophasic hyperaemic waveforms. Distal third of the calf not scanned due to bandaging.

Study Date: 11/09/2023

Reported By:

Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

US Doppler lower limb arteries Lt:

Clinical Indication: L/hallux new traumatic wound. L/F more swollen with erythema that reduces upon foot elevation. L/DP and PT monophasic. PVD? Booked at MDFT Clinical History: DMI

Findings:

The common femoral artery (CFA), profunda femoral artery (PFA), superficial femoral artery (SFA) and popliteal artery (POPA) are patent with triphasic waveforms detected, no significant stenosis noted.

Limited views of the crural vessels due to heavy calcification and therefore unable to rule out occlusions or significant stenoses however where seen:

- the tibio-peroneal trunk (TPT) is patent with triphasic flow
- proximal anterior tibial artery (ATA) is patent with triphasic flow, no flow detected mid to distal, unable to rule out whether due to occlusion or calcification.
- dorsalis pedis artery (DPA) is patent with triphasic flow
- posterior tibial artery (PTA) proximally is patent with triphasic flow.
- distal peroneal (PeroA) patent with triphasic flow

Study Date: 17/09/2023

Reported By:

Rima Begum

Clinical Vascular Scientist

Royal Free London NHS Foundation Trust

US Doppler lower limb arteries Rt:

Clinical Indication: anatomy of arteries Clinical History: right calf claudication

Findings:

Bowel gas obscuring views of the abdomen therefore short segments of flow not visualised.

The aorta is of normal calibre (2mm OTO AP) and patent with triphasic flow. The right proximal common iliac artery and mid to distal external iliac artery is patent with triphasic flow.

The common femoral artery (CFA) is mildly calcified and patent with triphasic flow. The profunda femoral artery (PFA) is patent with triphasic flow. The very proximal superficial femoral artery (SFA) is patent with multiphasic flow with a large well established outflow collateral noted. The proximal SFA then occludes thereafter with flow reconstituting distally. Distal SFA is patent with monophasic flow. The popliteal artery (POPA) is patent with monophasic waveforms.
Poor views of the tibio-peroneal trunk (TPT), however patent with monophasic flow where seen. The origin of the posterior tibial artery (PTA) and peroneal artery (PeroA) not visualised due to poor views. However, the PeroA appears patent to ankle with monophasic flow.
The prox to mid PTA appears patent with monophasic waveforms detected. Short occlusion noted in the distal PTA, with multiple collaterals noted. PTA at the ankle is patent with monophasic flow.
The prox to mid anterior tibial artery (ATA) is patent with monophasic flow. Flow occluded in the mid ATA with flow reconstituting at the ankle - with damped monophasic flow.

Study Date: 19/11/2023

Reported By:
Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

US Lower Limb Arterial Right

Clinical Indication: ?patency of vessels post right Femoro-distal vein bypass Clinical History: Right Femoro-distal vein bypass 19/10

Findings:

Limited assessment due to dressings.
The right common femoral artery and proximal anastomosis not visualised.

The prox to mid vein bypass appeared patent where seen with multiphasic hyperaemic flow with velocities
approx. 100cm/s. No significant narrowing noted in the distal anastomosis.
The distal peroneal artery is patent with multiphasic hyperaemic flow.

Study Date: 23/10/2023

Reported By:
Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

US Right lower limb arterial:

Clinical Indication: Stent patent? any issues? Clinical History: R SFA stent 22, lost to FU. New symptoms

Findings:
Moderate calcification throughout.
There is mixed focal plaque in the prox CFA causing approx. 75% stenosis with monophasic flow beyond.
The proximal PFA is patent with monophasic waveforms.
There is an approximate 50% stenosis at the origin of the SFA. The SFA stent is patent throughout with monophasic waveforms. There is an approximate 50-74% stenosis in the distal SFA.

The POPA, ATA and TPT are patent throughout with monophasic waveforms.
The majority of the PTA appears occluded with segments of patency seen in the mid PTA. However, no flow detected distally and at the ankle.
The prox to mid PeroA is patent with monophasic flow. No flow detected in the mid to distal Pero, suggesting its occluded.

Study Date: 20/10/2023

Reported By:

Rima Begum

Clinical Vascular Scientist

Royal Free London NHS Foundation Trust

US Doppler lower limb arteries Rt:

Clinical Indication: Targets for revasc. CFD pt (FAO Matt B!) Clinical History: New R foot wounds. Deteriorated waveforms on HHD. CFD pt please.

Findings:

The common femoral artery (CFA), profunda femoral artery (PFA), superficial femoral artery (SFA) and popliteal artery (POPA) are patent with triphasic waveforms detected, no significant stenosis noted.

The crural vessels are significantly calcified with heavy shadowing and therefore unable to rule out significant stenoses or short occlusions.

The tibio-peroneal trunk (TPT) is patent with triphasic flow. The posterior tibial artery (PTA) was segmentally assessed using spectral Doppler due to heavy calcification and shadowing obscuring the view. Proximally the PTA was triphasic and then becomes monophasic further down the vessel with monophasic flow detected at the ankle. Likely significant disease however unable to assess due to heavy calcification.

The anterior tibial artery (ATA) appears patent throughout with triphasic flow proximally and then becomes monophasic distally, with multiple collaterals noted throughout however no significant stenosis detected.

The peroneal artery (PeroA) appears multiphasic proximally and then becomes low resistant multiphasic distally. Short segment of flow not detected in the mid PeroA.

Study Date: 11/10/2023

Reported By:

Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

US Doppler lower limb arteries Lt:

Clinical Indication: Left heel ischaemic ulcer, deteriorated, rest pain increased, patient unable to walk. Very faint monophasic pulse on PTA. L Crural angioplasty in August 2023 ?re-occlusion Clinical History: T2DM, amputee

Findings:
The common femoral artery (CFA), profunda femoral artery (PFA), superficial femoral artery (SFA) and popliteal artery (POPA) are mildly diseased and patent with triphasic waveforms detected, no significant stenosis noted.
The crural vessels are significantly calcified and therefore only segments of patency seen due to shadowing.
The posterior tibial artery (PTA) is patent for a short segment proximally with high resistant flow and then appears occluded throughout its length, a short segment of monophasic flow noted at distally via collaterals however no flow detected at ankle.
The anterior tibial artery (ATA) is significantly calcified throughout, however patent to ankle. There are two 50-74% stenoses noted in the mid ATA and >74% stenosis noted in the distal third ATA, however multiphasic waveforms remained beyond.
The peroneal artery (PeroA) appears patent throughout its length with multiphasic waveforms detected throughout.

Study Date: 11/10/2023

Reported By:
Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

Clinical Indication: Patency of upper limb and lower limb arteries Clinical History: Complex neurosurgery and spinal surgery. Since then all toes and fingers dusky.

Findings:

US Doppler lower limb arteries Bilaterally:

The common femoral artery, profunda femoral artery, superficial femoral artery and popliteal artery are patent
with triphasic waveforms detected, no significant stenosis noted.
The tibio-peroneal trunk, posterior tibial artery, anterior tibial artery, dorsalis pedis artery, dorsal metatarsal artery
at the distal and peroneal artery are patent with triphasic waveforms detected, no significant stenosis noted.

US Doppler upper limb arteries Bilaterally:

The subclavian, axillary, brachial, ulnar, radial arteries are patent with triphasic flow.
Triphasic flow noted in the palmar digital arteries bilaterally.

Conclusion:
No significant stenosis detected bilaterally in the lower limb or upper limb arteries.

Study Date: 14/09/2023

Reported By:
Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

Clinical Indication: Any PAD Clinical History: Leg pains and swollen legs with weak left popliteal and DP and absent bilateral PTA.

Findings:

US Aorto-Iliac Arteries

The infra-renal abdominal aorta is patent and 17 mm AP diameter in calibre. The iliac arteries patent with triphasic flow where seen. Overlying bowel gas obscuring partial views of the abdomen.

US Doppler lower limb arteries Rt:

The common femoral artery (CFA) is moderately calcified an approx. 50% stenosis at the distal end with triphasic flow beyond. There is a 50-74% stenosis at the proximal profunda femoral artery (PFA) with triphasic flow beyond.
There is a calcified plaque causing a <50% stenosis in the mid SFA. A heavily calcified plaque in the distal SFA noted obscuring the views, however velocities beyond suggest a 50-74% stenosis, however triphasic waveforms maintained beyond.
The popliteal is moderately calcified with triphasic flow with approx. 50% stenosis.
The tibio-peroneal trunk (TPT), posterior tibial artery (PTA), anterior tibial artery (ATA) and peroneal artery (PeroA) are patent with triphasic waveforms detected, no significant stenosis noted.

US Doppler lower limb arteries Lt:

The common femoral artery (CFA) is mildly diseased with triphasic flow. There is approx. 50% stenosis at the origin of the profunda femoral artery (PFA) however triphasic flow maintained distally.
The proximal SFA exhibits triphasic flow, however flow becomes low resistant triphasic distally.
There is a heavily calcified plaque causing shadowing for approx. 3cm in the distal SFA obscuring views, unable to rule out occlusion or grade the stenosis, although likely moderate disease.
However, triphasic waveforms maintained beyond.
The popliteal artery (POPA) is patent with triphasic waveforms detected.

The tibio-peroneal trunk (TPT), posterior tibial artery (PTA), anterior tibial artery (ATA) and peroneal artery (PeroA) are patent with triphasic waveforms detected.

Study Date: 17/09/2023

Reported By:
Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

Clinical Indication: Assess for peripheral vascular disease Clinical History: Pain in both calves on walking, and rest pain at night Preferred exam date: Within 4 weeks

Findings:

US Doppler Aorto-iliac Arteries

The abdominal aorta measured 17mm AP diameter and appeared normal in calibre.
The common iliac and external iliac arteries are patent with triphasic waveforms bilaterally.

US Doppler lower limb arteries Rt:

The common femoral artery (CFA), profunda femoral artery (PFA), superficial femoral artery (SFA) and popliteal
artery (POPA) are patent with triphasic waveforms detected, no significant stenosis noted.
The tibio-peroneal trunk (TPT), posterior tibial artery (PTA), anterior tibial artery (ATA) and peroneal artery
(PeroA) are patent with triphasic waveforms detected, no significant stenosis noted.

US Doppler lower limb arteries Lt:

The CFA, PFA, SFA and POPA are patent with triphasic waveforms detected, no significant stenosis noted.
The TPT, PTA, ATA and PeroA are patent with triphasic waveforms detected, no significant stenosis noted.

Conclusion:
No significant stenosis detected bilaterally in the lower limb arteries.

Study Date: 21/10/2023

Reported By:
Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

Clinical Indication: Peripheral vascular disease Clinical History: Patient reporting pain when walking in his
calves US doppler of the legs to look for peripheral vascular disease. Preferred exam date: outpatient US doppler

Findings:

US Doppler Aorta-Iliac Arteries

Extensive overlying bowel gas therefore limited views. Where seen, the abdominal aorta measured 1.6cm AP diameter and patent with triphasic flow. The common iliac arteries were not visualised.
The right mid to distal external iliac artery is widely patent with triphasic flow.
There is a 50-74% stenosis in the left distal external iliac artery, which appears to be prior to a ?proximal CFA stent. The left mid external iliac appears widely patent with multiphasic flow.

US Doppler lower limb arteries Rt:

The common femoral artery (CFA), profunda femoral artery (PFA) are significantly calcified and patent with triphasic flow.
The superficial femoral artery (SFA) is significantly calcified. There is a 50-74% narrowing in the proximal superficial femoral artery (SFA) however maintains multiphasic flow beyond.
Poor views of the very proximal popliteal artery (POPA), however beyond shows monophasic flow, therefore likely significant disease. There is a calcified plaque in the mid POPA causing a 50-74% stenosis with monophasic waveforms beyond.
Significantly calcified crural vessels and therefore segmentally assessment
The posterior tibial artery (PTA) is occluded to ankle.
The anterior tibial artery (ATA) appears patent proximally, however no flow detected mid to ankle suggesting its occluded.
The peroneal artery (PeroA) is patent throughout with damped monophasic flow. Raised velocities noted proximally however unable to accurately grade due to shadowing but likely 50-74% narrowing.

US Doppler lower limb arteries Lt:

The common femoral artery (CFA) is patent with biphasic flow and slight turbulent waveform.
The proximal profunda femoral artery (PFA) is patent with biphasic flow.
The SFA is significantly calcified. Proximally is multiphasic flow however becomes monophasic further down consistent with distal disease. There is an approx. 3cm smooth calcified plaque causing 50-74% stenosis in the mid SFA with strong monophasic flow beyond.
The popliteal artery (POPA) is significantly calcified with monophasic flow beyond.
Significantly calcified crural vessels and therefore segmentally assessment
Raised velocities noted in the tibio-peroneal trunk (TPT), likely diseased however unable to accurately grade due to shadowing.
There is multiple 50% stenoses in the mid posterior tibial artery (PTA), however patent throughout with monophasic flow detected at ankle.
The anterior tibial artery (ATA) is occluded to ankle.
The peroneal artery (PeroA) is patent with monophasic waveforms throughout.

Study Date: 19/10/2023

Reported By:

Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

17 and 18

Clinical Indication: STT - L leg ulcer, low ABPI on right

Findings:

US Doppler lower limb arteries Rt:

The common femoral artery (CFA) and proximal profunda femoral artery (PFA) are significantly calcified however patent with triphasic flow.
There is 50-74% stenosis in the mid superficial femoral artery (SFA), however multiphasic flow is maintained distally.
The popliteal artery (POPA) is moderately calcified with triphasic waveforms.
The origin of the anterior tibial artery (ATA) not visualised however proximally is patent with triphasic flow. A collateral seen leaving the proximal ATA with no flow detected beyond. The mid to distal ATA is occluded with flow reconstituting in the dorsalis pedis artery (DPA) with monophasic flow.
There is a 50% stenosis in the tibio-peroneal trunk (TPT) with multiphasic flow beyond.
The prox posterior tibial artery (PTA) is patent with triphasic flow. A short segment of the mid PTA appears occluded - approx 5cm with reversal flow noted distally. Monophasic antegrade flow noted at the PTA at ankle.
The peroneal artery (PeroA) is patent with multiphasic waveforms through to ankle.

US Doppler lower limb arteries Lt:

The common femoral artery (CFA), profunda femoral artery (PFA), and proximal SFA are patent with triphasic flow.
There is a 50-74% stenosis noted in the mid superficial femoral artery (SFA) with triphasic flow beyond.
The popliteal artery (POPA) is moderately calcified with triphasic waveforms detected.

The crural vessels are significantly calcified with shadowing obstructing views and therefore patency segmentally assessed.

Triphasic flow noted in the proximal and distal ATA, however no flow detected in the mid ATA, unable to rule out whether due to calcification or occlusion.

The posterior tibial artery and peroneal artery are patent with multiphasic flow through to ankle.

Study Date: 19/10/2023

Reported By:

Rima Begum

Clinical Vascular Scientist

Royal Free London NHS Foundation Trust

US Doppler Lower Limb Arterial Bilateral

Clinical Indication: Duplex US on the arterial system of the both lower limbs Clinical History: Patient is diabetic with 6 weeks history of bilateral leg pain, by examination no pulses could be assessed below the groins

Findings:

Right

The CFA is patent with triphasic flow.

The SFA is moderately diseased and calcified with short segments not visualised due to shadowing, however appears patent throughout with triphasic waveforms.

The popliteal artery is significantly calcified however patent with multiphasic flow. The TPT is patent with triphasic flow.

Crural vessels are highly calcified and therefore segmentally assessed.

The ATA, PTA and Pero A appear patent throughout however becomes monophasic distally, suggesting moderate to significant crural disease, however unable to rule out significant stenoses due to shadowing caused by calcification.

Left

The CFA is patent with triphasic flow.
The SFA is moderately calcified with short segments not visualised due to shadowing, however appears patent throughout with triphasic waveforms.
The popliteal artery is calcified and patent with multiphasic flow.
The TPT not visualised.
The ATA, PTA and Pero A appear patent throughout however becomes monophasic distally, suggesting moderate to significant crural disease, however unable to rule out significant stenoses due to shadowing caused by calcification.

Study Date: 17/10/2023

Reported By:
Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

Clinical Indication: Duplex US on the arterial system of both lower limbs Clinical History: Patient is diabetic with 6 weeks history of bilateral leg pain, by examination no pulses could be assessed below the groins

Findings:
US Doppler Lower Limb Arterial Bilateral

Right

The CFA is patent with triphasic flow.
The SFA is moderately diseased and calcified with short segments not visualised due to shadowing, however, appears patent throughout with triphasic waveforms.

The popliteal artery is significantly calcified however patent with multiphasic flow. The TPT is patent with triphasic flow.
Crural vessels are highly calcified and therefore segmentally assessed.
The ATA, PTA and Pero A appear patent throughout however becomes monophasic distally, suggesting moderate to significant crural disease, however unable to rule out significant stenoses due to shadowing caused by calcification.

Left

The CFA is patent with triphasic flow.
The SFA is moderately calcified with short segments not visualised due to shadowing, however it appears patent throughout with triphasic waveforms.
The popliteal artery is calcified and patent with multiphasic flow.
The TPT not visualised.
The ATA, PTA and Pero A appear patent throughout however becomes monophasic distally, suggesting moderate to significant crural disease, however unable to rule out significant stenoses due to shadowing caused by calcification.

Study Date: 17/10/2023

Reported By:
Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

US Doppler Lower Limb Arterial Bilateral

Clinical Indication: Bilateral severe IC? PVD for intervention Clinical History: IC affecting both legs

Findings:

The common femoral artery (CFA), profunda femoral artery (PFA), superficial femoral artery (SFA) and popliteal artery (POPA) are patent with triphasic waveforms detected, no significant stenosis noted bilaterally.
The tibio-peroneal trunk (TPT), posterior tibial artery (PTA), anterior tibial artery (ATA) and peroneal artery (PeroA) are patent with triphasic waveforms detected, no significant stenosis noted bilaterally.

Conclusion:
No significant stenosis detected bilaterally in the lower limb arteries.

Study Date: 11/10/2023
Reported By:
Rima Begum
Clinical Vascular Scientist
Royal Free London NHS Foundation Trust

Clinical Indication: STT - previous private duplex suggests signficant stenoses in crurals. Buttock and calf pain when walking approx 100 yards

Findings:

US Aorto-iliac arteries

Overlying bowel gas limiting short segments of views of the abdomen however where seen:
The infra-renal abdominal aorta is of normal size and exhibits multiphasic flow.
The right and left common and external iliac arteries are patent with multiphasic flow.

US Doppler lower limb arteries Rt:

The common femoral artery (CFA) is mildly diseased with triphasic flow. The proximal profunda femoral artery (PFA) is patent with biphasic flow. The superficial femoral artery (SFA) is patent with a 50-74% stenosis in the mid segment however triphasic flow maintained distally.

The popliteal artery (POPA) is patent with triphasic waveforms throughout.
The tibio-peroneal trunk (TPT), peroneal artery (PeroA) and posterior tibial artery (PTA) are patent with triphasic flow throughout.
The anterior tibial artery (ATA) is patent with triphasic flow at the origin and very proximal ATA however diffusely diseased in the prox to mid segment with a higher end 50-74% stenoses. Several collaterals noted mid to distal ATA with retrograde noted distally and in the DPA.

US Doppler lower limb arteries Lt:

The CFA is mildly diseased with triphasic flow. The PFA is patent with triphasic flow. The SFA is patent with a <50% stenosis in the mid segment however triphasic flow maintained distally.
The popliteal artery (POPA) is patent with triphasic waveforms.
Poor views of the TPT however multiphasic flow noted distally.
There is a >75% stenosis in the proximal ATA however triphasic waveforms maintained to ankle.
There is a >75% stenosis at the origin of the PTA however multiphasic waveforms maintained to the ankle.
Multiphasic flow throughout the PeroA.

Study Date: 03/11/2023

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