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VASCULAR UPDATE

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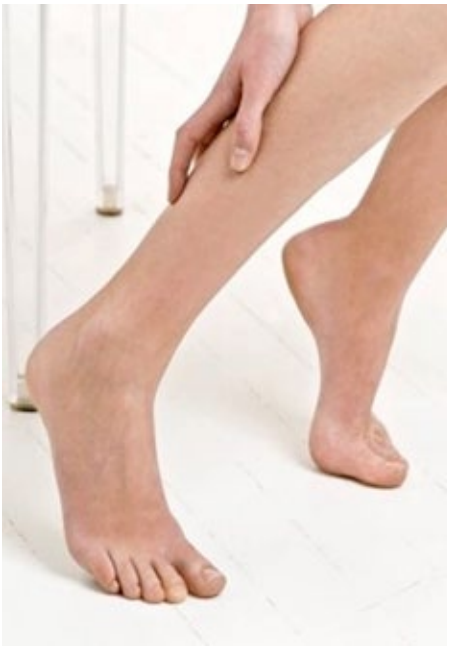
DIAGNOSING DEEP VEIN THROMBOSIS?

Deep vein thrombosis (DVT) is common with an annual incidence of 67/100 000. It is important to make an accurate diagnosis, as an untreated proximal DVT is associated with a 30-50% risk of pulmonary embolism, which carries a 12% mortality. Incorrect diagnosis of DVT also has the consequence of expense and the unnecessary risk of anticoagulation. Clinical signs and symptoms of pain, swelling and calf tenderness cannot be used alone to diagnose DVT and further tests are necessary to exclude or confirm the diagnosis.

Clinical assessment

Clinical assessment is useful in stratifying patients into low, moderate and high risk of DVT. An example is the Wells Probability Model that uses symptoms, signs, risk factors and possible alternative diagnosis to categorise patients. (Table I)



CLINICAL FEATURE		INTERPRETATION
Active cancer	1	≤ 0: low probability
Paralysis, paresis, recent plaster immobilization lower limb	1	
Recently bedridden > 3 days, surgery within 4 weeks	1	
Localized tenderness along deep vein	1	1-2: moderate probability
Entire swollen leg	1	
Calf swollen > 3 cm compared to other leg	1	
Pitting oedema (> other leg)	1	≥ 3: high probability
Collateral superficial veins (non varicose)	1	
Alternative diagnosis as likely or more likely	-2	

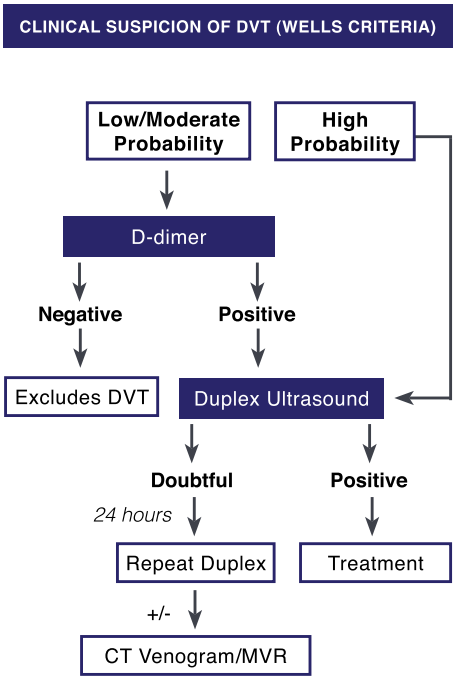
Table 1: Modified from Wells PS et al Lancet 1997; 350: 1705-1797

D-dimer testing

D-dimers are the products of degradation that result from the cleavage of cross-linked fibrin by plasmin. D-dimer blood levels reflect the presence of intravascular fibrin. D-dimer levels have high sensitivity but poor specificity for DVT (35.2%). Levels are raised in DIC, malignancy, postoperative states, infection, trauma and pre-eclampsia. D-dimer levels are less useful in the hospital setting compared to the outpatient setting. **A negative D-dimer test excludes a DVT (negative predictive value of 95), whereas, a positive D-dimer test requires further confirmatory testing.**

Imaging

Duplex ultrasonography is the most widely used diagnostic test for an acute DVT. Advantages of duplex are that it is readily available, non-invasive and portable. Disadvantages are that it is operator dependent and that iliac and calf veins are sometimes difficult to evaluate. Duplex ultrasonography has excellent sensitivity (97%) and specificity (94%) for proximal DVT, with positive predictive value of 97% and negative predictive value of 98%. The sensitivity and specificity for calf veins is around 75%. If the ultrasound examination is initially equivocal, a repeat ultrasound examination will be necessary. CT venography, MR venography and ascending venography are used selectivelyw.



A STITCH IN TIME:
TIMING OF CAROTID ENDARTERECTOMY

Patients with a symptomatic carotid artery stenosis present with amaurosis fugax (retinal TIA), transient ischaemic attack (TIA), crescendo TIA, stroke in evolution or a completed stroke. These events can be considered stable or unstable. Intervention is indicated in symptomatic patients who have a > 60% ipsilateral carotid stenosis. ALL such patients need to receive best medical therapy (BMT), including a statin and anti-platelet therapy. The question is: WHEN should intervention take place?

Stable Index Event: TIA, Amaurosis, Completed Stroke

Stroke risk after an index event has been grossly UNDERESTIMATED in the past. The risk of stroke can be predicted with some accuracy. Risk factors include age, gender, plaque ulceration / echolucency, and bilateral stenosis. Ocular events carry a lower risk of subsequent stroke than do cerebral ischaemic events.

The risk is highest immediately after the index event (most events occur in the 1st two weeks), and falls exponentially with time (fig 1).

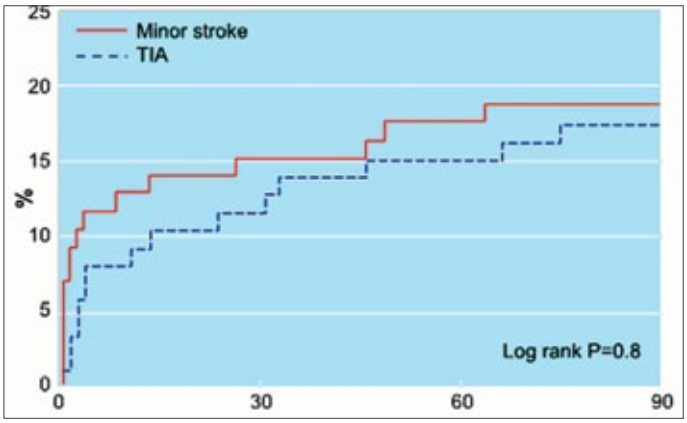


Fig 1: Cumulative Risk of Stroke after TIA or Minor Stroke: the majority of events occur within the 1st 2 weeks

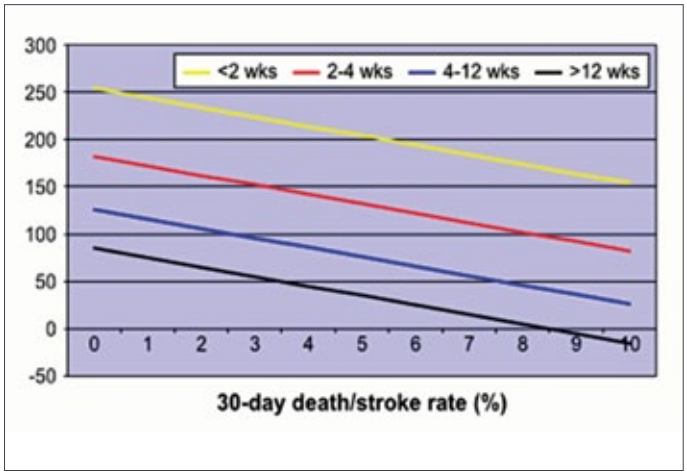


Fig 2: Number of strokes prevented per 1000 CEA years depending on timing of intervention from index event and peri-operative stroke/death rate.

Females lose benefit faster than men, such that intervention in females after 2 weeks from the event no longer carries any benefit over BMT when assessed at 5 years. In males the advantage of intervention is still present at 5 years if intervention is carried out within twelve weeks of the index event. Overall, early intervention will prevent many more strokes than later intervention, but only if the intervention can be performed with acceptable risk levels. (fig 2)

Unstable Index Event: Stroke in Evolution [SIE] or Crescendo TIA [cTIA]

Thrombolysis may be considered if a patient is seen at a Stroke Unit within 3 hours of symptom onset. If more than three hours have elapsed, then patients should still be worked up rapidly to exclude an intra-cerebral bleed, and to assess degree of carotid stenosis.

The natural history of this type of neurological event is dismal, with SIE carrying a 17% stroke rate, and a 20% stroke and death rate. cTIA carries equivalent rates of 7% and 11% respectively. Early intervention in these cases carries a mortality rate of 4 – 6% and a stroke rate of 6%. Thus early intervention is risky, but can reduce significantly reduce the stroke and death rates.

SUMMARY

:: In patients with TIA or minor stroke secondary to a high grade ipsilateral carotid stenosis, endarterectomy should be performed WITHOUT DELAY to give patients the best risk reduction possible. This is true for both stable and unstable symptoms. For women, delay beyond 14 days renders intervention unhelpful.

SUPERFICIAL THROMBOPHLEBITIS

Superficial thrombophlebitis is a common problem in general practice. It is estimated that 123 000 Americans develop it annually. Little more than 50% occur in varicose veins and recurrence rates vary from 5-50%. It is notoriously persistent with more than 50% persisting beyond 30 days and many cases taking up to 3 months to resolve.

A duplex ultrasound based study by Ascher in 1995 demonstrated that as much as 40% of patients with superficial thrombophlebitis involving the greater saphenous vein in the thigh or approaching the sapheno-femoral junction may have an associated deep vein thrombosis. This may be either contiguous (an extension of clot through the sapheno-femoral junction) or non-contiguous.

High ligation of the saphenous vein has traditionally been recommended when the process extends to within 5cm of the SFJ, but this may result in pulmonary embolism if the clot has already extended deeply.

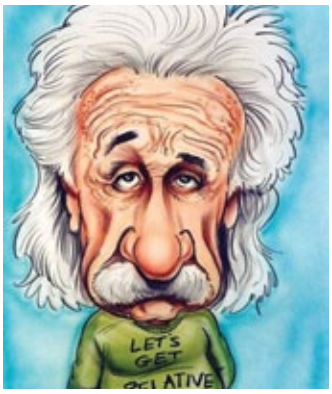
Treatment consists of rest, analgesia, anti-inflammatories and careful reassessment. Topical anti-inflammatory gels and elastic support are helpful. Extensive thigh involvement requires anticoagulation and a colour duplex scan of the deep veins. High ligation may be required. A proportion of cases are associated with underlying hyper-coaguable states (especially malignancy) and appropriate investigation is required in recurrent cases or when several areas of the body are affected (thrombophlebitis migrans).

FAMOUS VASCULAR PATIENTS

Albert Einstein was born in 1879 in Ulm, Germany and died from a ruptured abdominal aortic aneurysm in Princeton, New Jersey at the age of 76.

In December 1948, Dr. Rudolph Nissen, famous for developing the operation to prevent oesophageal reflux, performed an exploratory laparotomy on Einstein for abdominal pain. He found a "grapefruit-sized" aortic aneurysm that was thought to be the cause of the symptoms. At that time, ligation of the abdominal aorta had already proved to be ineffective, and replacing the aorta with a graft was still a decade away. The only available treatment was to attempt to reinforce the aortic wall and delay the inevitable rupture.

Dr Nissen wrapped the visible anterior portion of the aneurysm with cellophane, in the hopes of stimulating an intense fibrous tissue reaction that would strengthen the bulging aortic wall. Einstein recovered from the operation, and returned home after a 3-week hospital stay. Following this palliative operation,



Einstein lived for 6 more productive years with only minor symptoms.

On Tuesday, April 12, 1955, Einstein developed severe abdominal pain. Although Einstein must have realized that the aneurysm had finally burst, he initially refused hospitalization. He finally agreed to be admitted to the Princeton Hospital, only because he felt he was becoming too much of a burden at home. Einstein refused surgery, saying: "I want to go when I want. It is tasteless to prolong life artificially. I have done my share, it is time to go. I will do it elegantly." He died at 1:15 am on April 18, five days after admission. **KL**

what's new at Matley & Partners?

PROFESSOR ROBERT BAIGRIE

BSC MBCHB MD FRCS (ENG)

We would like to congratulate Bob Baigrie who has been awarded an Adjunct Professorship in the Department of Surgery by the University of Cape Town. This is the first time a part-time surgeon has been accorded this status by the University. Bob has been a part time consultant and senior lecturer in the GI Unit at Groote Schuur Hospital and the Faculty of Health Sciences, with a particular responsibility for the operative training of the Junior Consultants. He is also one of the three lead clinicians in the Combined Colorectal Cancer Clinic.

He is on the editorial board of the British Journal of Surgery, and is the only South African private surgeon to be accorded this privilege. He is a reviewer for several other journals including Annals of Surgery. He has published more than 45 peer-reviewed original articles, as well as contributing several book chapters and reviews, and spoken at over 20 international conferences. He is currently the President of the South African Society of Endoscopic Surgeons (SASES) and was the Society's eponymous lecturer in 2005. He is a founder member of the International Colorectal Forum in Switzerland.

VASCULAR PROBLEMS IN THE DIABETIC FOOT

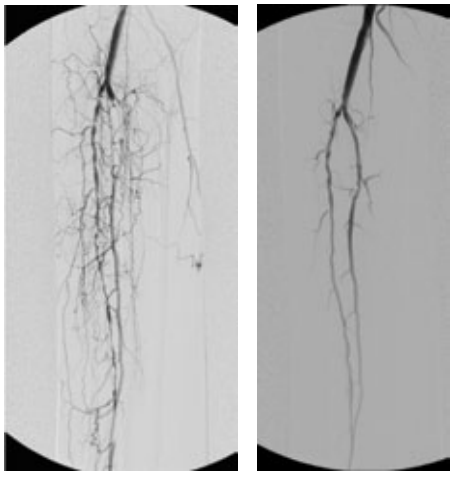
The arteries in a diabetic are affected by atherosclerosis and (Monckenberg's) medial sclerosis. Atherosclerosis causes ischaemia by narrowing and blocking the arteries, while medial sclerosis results in calcification of the media and causes rigid vessels without narrowing the lumen.

As many as 20 - 40% of patients with diabetes have peripheral vascular disease and up to 50% of patients with a foot ulcer have signs of PVD. Ischaemia secondary to peripheral vascular disease is the most important factor related to the outcome of a diabetic foot ulcer. There are no atherosclerotic lesions specific to diabetes, although the pattern of atherosclerosis is slightly different.

The most noticeable differences compared with non-diabetics are:

- it affects younger patients
- it affect smaller vessels below the knee with relative sparing of aorto-iliac segments
- the arteries of the foot itself are usually spared
- diabetics who smoke often have involvement of proximal vessels and foot vessels and this complicates the revascularisation procedure
- it is more aggressive
- its progression is faster
- there is no sex difference

The majority of patients with clinically detectable PVD are asymptomatic. Less than 25% with significant disease report intermittent claudication. End-stage symptoms are ischaemic rest pain (especially at night) and ulceration/gangrene. Many of these patients, however, may not experience any pain despite extensive tissue loss because of sensory loss due to their peripheral neuropathy.



Pre- and post angioplasty angiogram of patient who presented with a non-healing foot ulcer

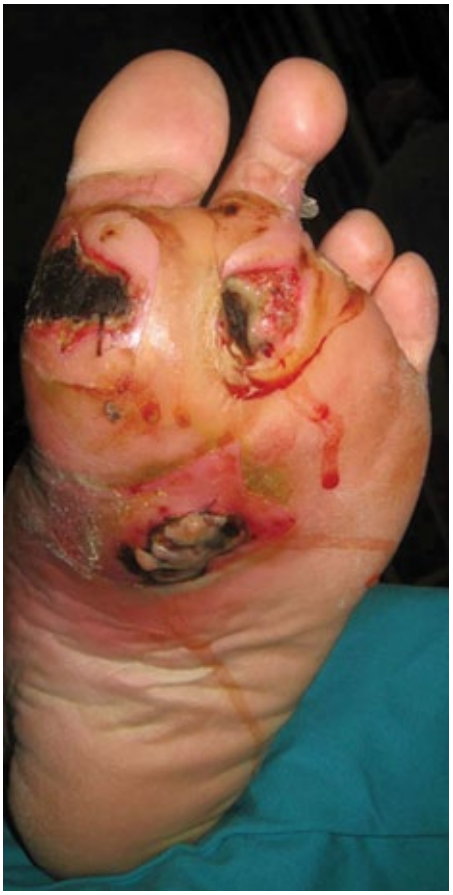
Principles of Treatment

1.The treatment of vascular insufficiency either by bypass grafting or endovascular intervention is crucial for limb salvage, but a multidisciplinary approach addressing the complex pathology and biomechanics of the diabetic foot is crucial if amputation rates are to be decreased.

2.Patients with a short life expectancy (due to co-morbid conditions or terminal cancer), non-ambulatory or bedridden patients are better served with primary amputation.

3.Extensive necrotising infection that after debridement will no longer provide the patient with a functional foot likewise requires primary amputation.

4.In patients presenting with ischaemia and infection, spreading sepsis must be controlled prior to definitive arterial reconstruction. Most infections in diabetics are polymicrobial, and broad-spectrum intravenous antibiotics should be started after cultures have been taken. The patient should



then proceed to debridement to remove all visibly infected and non-viable tissue.

5.Dry eschars without signs of infection should only be debrided if arterial reconstruction is planned. Dry gangrene of individual toes should not be removed until revascularization is completed. Debridement or amputation of dry non-infected tissue without prior restoration of pulsatile flow to the foot can lead to an increase in necrosis of tissue and excacerbation of sepsis.

TAKE HOME MESSAGE

:: Impalpable Pulses + Tissue loss = significant peripheral vascular disease
:: No diabetic should undergo an amputation prior to a proper vascular evaluation