

VASCULAR UPDATE

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5 PATIENTS WHO SHOULD SEE A VASCULAR SURGEON



a. Stroke and Transient Ischaemic Attack

Stroke is a sudden and devastating illness. 40% of initial strokes are fatal and it is the leading cause of adult disability in first world countries.

Stroke is defined as a focal neurological deficit lasting more than 24 hours. A transient ischaemic attack (TIA) by definition lasts < 24 hrs. 80% of strokes are ischaemic and 20% are haemorrhagic. 3/4 of the ischaemic strokes (60% of all strokes) involve the anterior and middle cerebral artery territory supplied by the internal carotid artery. Half of these strokes (30% of all strokes) are related to carotid artery disease.

Around 15% of strokes are preceded by a TIA and may be a warning sign of an impending stroke. There is a 10% risk per year of a future neurological event in a patient who has a TIA/stroke, and is found to have a high grade (>70%) carotid stenosis. The most dangerous period is within the 1st 2 weeks. In symptomatic patients with a high grade carotid stenosis, the risk of future stroke drops to < 1% after a successful carotid intervention.

Patients presenting with a TIA/stroke thus require an urgent clinical assessment and a duplex ultrasound assessment of their carotid and vertebral arteries. Timeous intervention in patients with symptomatic high grade carotid stenosis can significantly reduce the incidence of further TIA/strokes.



b. Unilateral swollen leg

Bilateral limb swelling is often related to generalized systemic fluid retention, whereas unilateral leg swelling usually indicates a local problem within that limb. There are a number of reasons why patients develop unilateral limb swelling, but the two most common causes are venous or lymphatic dysfunction.



Venous dysfunction occurs secondary to either obstruction or reflux (backflow) within the deep or superficial veins. This leads to increased venous pressure and accumulation of fluid in the soft tissue.

Lymphoedema is a condition in which the lymphatic channels within the fatty tissue under the skin are dysfunctional. This problem can occur as a primary developmental disorder or secondary to soft tissue infection or injury following surgery or radiation.

Both of these conditions require vascular assessment and investigation in order to treat appropriately.

c. Chronic leg ulcers

By definition, these are defects in the skin, below the knee, that have been present for at least 6 weeks and show no tendency to heal after 3 months. These ulcers always involve loss of the superficial layer of the skin but can extend into the deeper tissues.

Chronic leg ulcers are common and as much as 10% of the population will develop a chronic wound during their lifetime. Venous insufficiency accounts for 70% of all lower leg ulcers, arterial disease accounts for another 5-10% and the remainder of chronic leg ulcers are generally due to neuropathy ('numbness') or a combination of risk factors.

Most lower limb wounds should heal within 2 weeks. Patients with chronic leg ulcers require clinical and radiological assessment by a vascular surgeon to determine the underlying cause so that the appropriate therapy can be administered to ensure healing.

d. Blue Toe Syndrome (BTS)

Blue Toe syndrome is characterized by the sudden onset of blue discoloration of one or more digits, usually associated with significant pain. The cause is embolism of atheromatous material and cholesterol crystals.

Typically, foot pulses are palpable, and the remainder of the foot is well perfused. There may be patchy purple discoloration of the sole of the foot and heel as well. Splinter haemorrhages,



petechiae, purpura and ulcers are associated in many cases, and there may be raised cutaneous nodules caused by inflammatory reaction to the subepidermal cholesterol collections.

The source of the atheroembolism is in the upstream circulation. The common sites are aorta, iliacs, and femoral vessels. Aneurysms of these vessels may embolise, but typically that would cause an acute limb ischaemia rather than a blue toe. Plaques causing vessel stenosis may embolise distally to cause BTS. BTS may be a complication of vascular and endovascular procedures, including aneurysm repair, angioplasty and stenting, cardiac procedures, and coronary angiography.

Treatment involves aspirin, statins, and risk factor modification. Outcomes depend upon identification and

treatment of the underlying source of the embolism. Where there is significant ischaemia of a digit, amputation may even be required.

e. The Six P's

The acutely painful, pale, pulseless, paraesthetic, paralysed and (perishingly) cold lower leg and foot is an acutely ischemic limb until proven otherwise. This is a surgical emergency that is likely to result in loss of the limb and possibly life if not addressed timeously. 80% of cases are due to acute thrombosis, usually in patients with pre-existing vascular disease and 20% due to embolus. Other less common causes could be secondary to extensive venous thrombosis (phlegmasia alba dolens) and even more rarely complex neurological syndromes.

Due to the very high complication that can result from arterial occlusion it is paramount that patients who develop these features should be referred to a vascular surgeon for urgent assessment and investigations and management.



WILL NEW ANTICOAGULANTS REPLACE WARFARIN?

Warfarin was first registered for human use in 1954. It was the first effective oral anticoagulant and made out-patient treatment of thrombotic events possible. As such, it had an unchallenged position in the management of venous thromboembolism (VTE), arterial embolisation and for stroke prevention in atrial fibrillation (SPAF).

Warfarin has many problems associated with its use. Drug interactions are extremely common and the INR needs to be constantly monitored. As a

result, there has been intensive research to find a possible replacement for Warfarin.

The Novel Anticoagulants (NOACs) have been available since 2008.

Rivaroxaban (Xarelto®, Bayer) and Apixaban (Eliquis®, Bristol-Myers-Squibb) are highly selective direct Factor Xa inhibitors. They have predictable oral absorption, and bioavailability and thus monitoring of effect is unnecessary. There are few drug interactions of major significance (ketoconazole, erythromycin, diltiazem, amiodarone,

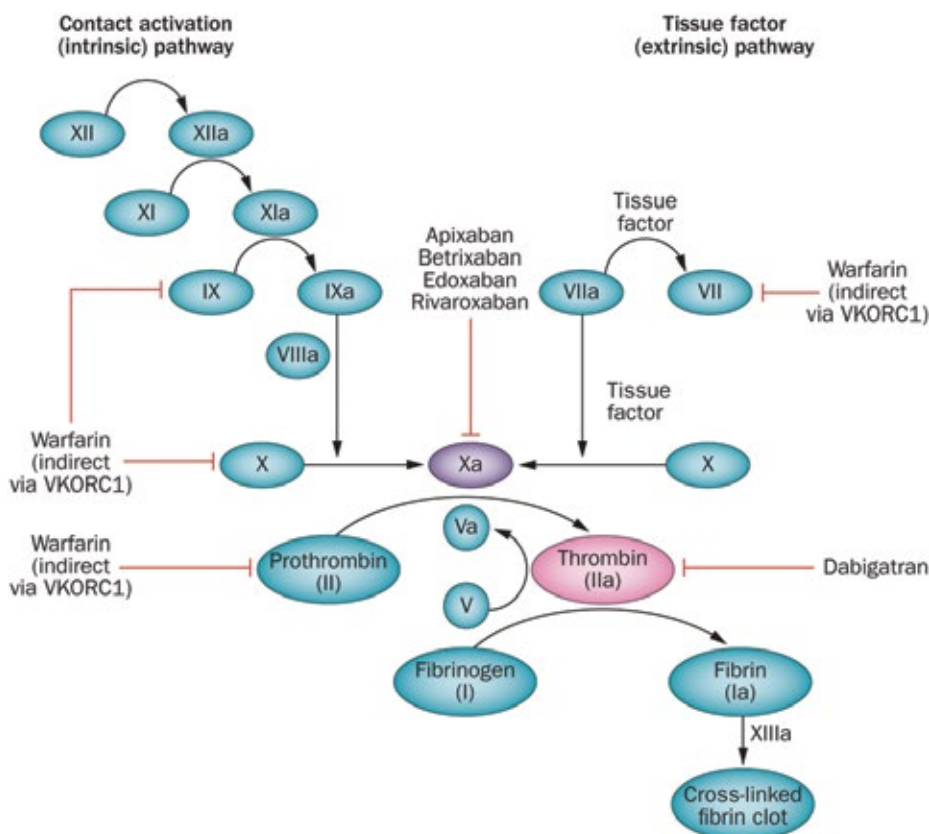
anti-epileptics, rifampicin). Use in hepatic and severe renal impairment is unsafe. The concomitant use of aspirin and clopidogrel should be avoided.

Dabigatran (Pradaxa®, Boehringer-Ingelheim) is a direct Thrombin inhibitor. Like Rivaroxaban, it has a flat dose response curve and predictable bioavailability, meaning that monitoring is unnecessary. Its use in patients with moderate to severe renal impairment is contra-indicated. It has similar drug interaction issues to Rivaroxaban and Apixaban.

Pre-marketing trials of all three drugs have shown non-inferiority when compared with Warfarin for VTE prevention and treatment, as well as SPAF. Xarelto and Pradaxa at 150mg daily were shown to have significantly less major bleeding complications than Warfarin. They are thus considered to be alternatives to Warfarin in clinical use. Real world experience from post market studies, however, has painted a less rosy picture. Pradaxa has had an unexpectedly high rate of major bleeding associated with its use. The situation for Xarelto and Eliquis is currently uncertain.

The main barrier to widespread use of the NOACs is the cost. Warfarin costs approximately R275.00 per month (including one INR test and dosing instruction), whereas the cost of Xarelto for VTE treatment (20mg dose) is R800 per month. Pradaxa is similar. Warfarin treatment is thus MUCH cheaper.

So, at present, in a South African market, Warfarin is still the oral anticoagulant of choice. The NOACs will have to become significantly cheaper before they can realistically challenge Warfarin in that role.





New upgrade of the Kingsbury Vascular Suite keeps the unit at the forefront of technology

In 2003 Kingsbury Hospital opened the first true hybrid-operating suite in South Africa. A hybrid suite combines all the features of a large operating theatre with a built in angiography system so that the full range of vascular procedures (endovascular procedures, open procedures and combinations of these) can be done in a single facility without compromising the standards of sterility and angiographic excellence. The vast majority of vascular patients needing

an intervention can be assessed simply by colour duplex ultrasound and then proceed to definitive treatment within the hybrid theatre environment. This development established the Kingsbury Vascular Unit as the leading vascular unit in South Africa.

Eleven years later the unit is being completely rebuilt and upgraded with the latest multi-plane technology: the latest version of the Artis Zeego system from Siemens. This sort of investment is

only possible in a very busy specialized unit. The unit comprises four vascular surgeons, Philip Matley, James Tunnicliffe, Martin Forlee and Bhavesh Natha, as well as a multi-disciplinary team.

Artis zeego is the first multi-axis system based on robotic technology and includes Large Volume Dyna-CT for visualization of the whole abdomen and thorax during surgery (an intra-operative CT scan). Zeego offers high-end applications for surgery through 3D imaging, and excellent image quality at very low radiation dose to protect both the patient and the staff. It's unique variable isocenter enables the

surgeon to adjust the working height of the system which helps reduce the fatigue associated with performing long procedures.

Most exciting of all is the ability to perform fusion imaging. This imports images from a pre-operative CT into the system allowing the operation to be performed in "virtual reality" using the 3D CT images without the need to perform multiple additional angiographic examinations during the procedure. This reduces contrast load and radiation exposure considerably and is of particular importance in patients with renal insufficiency.

Expansion of Vascular Services at Life Vincent Pallotti Hospital

Matley and Partners are pleased to announce that we have expanded the range and scope of the Vascular Surgery service offered at Life Vincent Pallotti Hospital.

The hospital has recently upgraded the theatre facilities including a state of the art radiological screening table, upgraded C-arm software, new vascular instruments and duplex ultrasound. This enables us to perform open, endovascular and hybrid vascular surgery at Life Vincent Pallotti. The elective vascular operating lists are on

Monday, Thursday and Friday.

Martin Forlee and Bhavesh Natha consult at Vincent Pallotti, meaning there is a vascular surgeon and an ultrasonographer on site every day of the week. Our duplex ultrasound service is available to perform carotid scans, deep vein thrombosis and venous function studies and the assessment of peripheral arteries and arterio-venous fistulae for dialysis access.

We are also launching "The Vein Unit at Life Vincent



left to right: Martin Forlee, Chris Kwane (Admin), Megan Foaden (Duplex ultrasound), Zogera Ganie (Reception), Nazeema Bardien (Reception) Bhavesh Natha

Pallotti Hospital". This endeavor is aimed at the management of all aspects of venous disease, including varicose veins, venous ulcers and deep vein thrombosis. It includes a dedicated treatment

room that is capable of performing office based varicose vein procedures that do not require theatre.

For appointments phone **021- 531 0097** or email deskvpr@surgcare.co.za

OBESITY & VASCULAR SURGERY

According to WHO criteria, overweight is defined as a body mass index (BMI) of $> 25 \text{ kg/m}^2$ and obesity as $> 30 \text{ kg/m}^2$. Nearly 30% or 2.1 billion people worldwide are overweight or obese. The prevalence in South Africa is very high with more than 38,8% of men and 69,3% of women being classified as overweight or obese. This is higher than reported in other African countries, particularly in women, since nearly 42% of South African women > 20 y.o. are obese. Neighbouring sub-Saharan African countries such as Namibia (19.8%), Lesotho (24.1%) and Zimbabwe (33.5%) have significantly smaller proportions of obese women than South Africa. Eritrea only has 4.7% obese women and Ethiopia 1.8% – respectively, about 10 and 20 times less than South Africa¹.

Obesity can be classified as a chronic disease, similar to hypertension or insulin resistance. There are a large

number of clinical problems associated with being obese. These can be categorised into those that are associated with excess adipose tissue including osteoarthritis, sleep apnoea and psychological problems and those that are associated with the metabolic effects of adiposity including coronary artery heart disease, hypertension, type 2 diabetes mellitus and certain types of cancer².

A recent study³ examined the effect of body mass index on surgical 30 day mortality and morbidity in vascular surgical procedures. The outcomes in 7543 patients who underwent procedures including aneurysm repair, carotid interventions, amputations and other peripheral interventions were analysed. Patients were characterized as underweight (BMI $< 18,5$), normal (BMI 18,6-25), overweight (BMI 25,1-30), Obese I (BMI 30,1-35), Obese II (BMI 35,1-40) and Obese III (BMI > 40).

The results were as follows:

- The **incidence** of medically treated diabetes and hypertension was higher in obese patients. Slightly obese patients had the lowest coronary artery disease. Most other risk factors, showed a U-shaped distribution with higher number of risk factors in the underweight and obese class III, and lowest in the overweight and obese class I, (even less than the normal patients).
- 30 day mortality** rates by obesity class demonstrate a “reverse J-shape” with the highest values in the underweight and normal BMI patients. Slightly obese patients had lower mortality than normal patients. This supports the well documented phenomenon known as the obesity paradox: where slightly obese patients have a higher risk of developing heart disease, but have a significant survival benefit once diagnosed with cardiovascular disease. The mechanisms are unclear.
- 30 day composite morbidity** was “U-shaped” with highest complications in the underweight and obese class III extremes. Respiratory complications, wound infections and thromboembolism increased significantly as obesity class increased.

>>> TAKE HOME MESSAGE

- * Overweight or slightly obese patients have less mortality following vascular surgery.
- * Severely underweight and severely obese patients have the highest mortality and complication rates
- * Complications are higher with increasing BMI.

Interesting Reading:

1. Global, regional and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the global burden of disease study 2013. Lancet 2014;384:766-81
2. Goedecke JH et al. Obesity in South Africa. Chapter 7 in MRC Chronic Diseases of Lifestyle in South Africa:1995-2005
3. Davenport et al. The influence of BMI obesity status on vascular surgery 30 day mortality and morbidity. J Vasc Surg 2009;49:140-7

