

Deep-vein Thrombosis in Runners. Beware the Limping Athlete — Dr Gordon Irving

Dr Gordon Irving

Department of Anaesthesia
Groote Schuur Hospital
Observatory
Cape Town

Curriculum vitae

Gordon Irving studied at Newcastle, England where he obtained a MB BS. He came to South Africa in 1974 where he specialized in Anaesthesia. He then pursued his interest in Sports Medicine, lecturing in Physiology and Sports Science at UCT, and obtained a MSc in Sports Medicine in 1983. Until recently he was in private practice as a GP, seeing mainly sports-medicine problems. He obtained an MMed (Anaes) in 1990 and is at present a consultant anaesthetist at Groote Schuur Hospital with a special interest in chronic pain.

Summary

The histories of three runners are described. They presented with calf pains, initially thought to be muscle tears. Venograms demonstrated deep-vein thrombosis with progression to the femoral veins in two subjects. The mechanism, recognition and treatment of venous thrombosis is reviewed and related to the three patients.

S Afr Fam Pract 1991; 12: 183-5

KEYWORDS:

Sports Medicine; Muscles; Thrombosis; Venous; Running

Three runners with calf pains were seen in a private sports medicine practice. Two had had previous treatment by physiotherapists and were not improving and one was seen untreated.

Runner 1

He was a forty-five year old male who had been a regular runner for eighteen months. He had completed three marathons and one ultra-marathon (56 kilometres) and had had muscle tears previously, successfully treated by physiotherapy. He was running eighty to one hundred kilometres per week up to the time of being seen. He was a non-smoker, was not on any medication and had no other significant history.

He ran a standard marathon in a personal record time of 3 hrs 35 mins four days prior to being seen. The marathon was held in hot conditions and, although he stated that he drank

adequately at each refreshment table, he felt very tired afterwards. He sat down after finishing the race and, on attempting to get up, found he was unable to do so. He was carried to the medical tent where two litres of intravenous fluid were given with rapid resolution of his "total fatigue". Four days after the marathon he prepared to go for his first post-marathon run. However, on arising that morning, he felt a severe pain in his right medial thigh and his calf felt "sore". The discomfort was such that he didn't attempt to run but went to his physiotherapist for treatment. Physiotherapy, including hard, deep transverse cross-frictions over the tender spot in the thigh did not improve his symptoms. The day after physiotherapy he presented with a swollen, painful calf and positive Homan's sign (dorsiflexion of the ankle causing calf pain). An emergency venogram confirmed the diagnosis of a deep-vein thrombosis extending up to the mid-thigh. He was hospitalized and anticoagulation treatment was instituted. The patient made an uneventful recovery, apart from mild haemoptysis on the first day. A chest x-ray, ECG and radionuclide lung scanning failed to confirm a significant pulmonary embolus.

Runner 2

A twenty-eight year old female who had been jogging for one month prior to being hospitalized for a small gynaecological procedure. This procedure was performed in the lithotomy position under general anaesthesia. She was a light smoker (claimed 8 cigarettes per day) and was on the oral contraceptive pill. She had no other medical history of significance.

... Deep-vein Thrombosis in Runners

After resting in bed for two days after the operation she went for her first run and experienced pain in both calves. This was so severe that she was unable to continue the run and was limping badly when first seen.

An emergency venogram confirmed bilateral deep-vein thromboses confined to the calf veins. She was hospitalized, treatment was instituted and she was strongly advised to stop smoking and use other forms of contraception.

Runner 3

A forty-two year old male who had been a regular runner for several years. He had been averaging 30-50 kilometres per week until business commitments forced him to stop running regularly for six weeks just prior to his presentation. These commitments involved several trips to Johannesburg and Durban, often returning the same day, associated with numerous business meetings.

Deep-vein thromboses have been reported to be relatively rare in runners – but now we suspect missed diagnosis

He was a non-smoker, was on no medication and had no previous medical history of relevance.

After his business-enforced lay-off, he resumed his running but almost immediately began to experience discomfort in his right calf associated with slight swelling after reaching the top of his first hill. Thinking it to be a calf tear he went to a physiotherapist who “cross-

frictioned” it, to no avail. When the swelling and discomfort persisted and was affecting his thigh, he sought further advice. An emergency venogram confirmed a deep-vein thrombosis extending into the femoral vein. He was hospitalized and treated uneventfully.

Discussion

Deep-vein thromboses have previously been reported in runners^{1,2,3} but must be relatively rare occurrences. However, as a missed diagnosis may present with a pulmonary embolism and severe respiratory problems,⁴ a high index

Be aware of the possibility of other pathologies mimicking a common injury

of suspicion must therefore be maintained.

Calf pains are an extremely common, almost ubiquitous injury with endurance runners. The majority of these pains are due to chronic, or acute on chronic calf tears. These respond well to stretching exercises, heel raises, shoe replacement where necessary, training modification and physiotherapy modalities, of which, deep transverse frictions or cross frictions appear to be the most effective. Deep transverse frictions is a technique first described by Cyriax⁵ whereby the tender part of the muscle is palpated until the patients symptoms are recreated. The area is then massaged hard across the muscle fibres. The treatment is extremely painful for the patient, to the extent that the cross-frictions are often

known as ‘crucifixions’. An average of four, five to ten minute sessions are usually adequate to symptomatically “cure” a chronic calf tear in a runner.

The above three runners presented with calf pain, and in two cases thigh pain. The diagnosis of chronic muscle

Urgency is necessary to diminish the risk of pulmonary embolism

tear was initially made in two patients with the incorrect treatment instituted. With subsequent careful examination, the calf muscles were found to be swollen, warm, generally tender and with prominent superficial veins, all the clinical criteria for a deep-vein thrombosis.

Virchow, in 1856 described a triad of factors which interact to promote venous thrombosis. This triad consists of vessel wall damage, an activation of the intrinsic clotting mechanism and a slowing of the blood flow. Runner No 1 possibly had some sludging of blood flow due to haemoconcentration because of inadequate hydration during the marathon four days before presenting with pain. Runner 2 was on the oral contraceptive pill and smoked, both of which affect the intrinsic coagulation mechanism making clots more common. She also would have experienced stasis in venous return of the calf veins during her general anaesthetic and possibly pressure on her calf veins during the time her legs were in lithotomy position. Runner 3 possibly suffered venous stasis and pressure behind the knees from

... Deep-vein Thrombosis in Runners

excessive sitting in planes and during long business meetings.

As doctors dealing with the athlete we should be aware of the possibility of other pathologies mimicking a common injury. Athletes who have a previous history of deep-vein thrombosis, smokers, those on the oral contraceptive pill, those who have recently been dehydrated during a race, or have spent excessive time sitting still, must be considered as being at risk of developing a deep-vein thrombosis. An athlete who presents with a calf pain and has generalised tenderness which may be associated with a swollen and hot calf, together with prominent superficial veins, should be investigated promptly with a venogram. Urgency is necessary to institute the correct therapy in order to diminish the risk of a pulmonary embolism. Pulmonary embolism may present with acute onset of pleuritic type chest pain, shortness of breath and haemoptysis. In massive embolism death may rapidly ensue. Treatment of deep-vein thromboses consists of anti-coagulation to prevent further clot formation and to allow the body to seal off or recanalise the affected vessels. The person is initially hospitalized and intravenous heparin is started together with oral warfarin. Oral warfarin is continued to maintain adequate anti-coagulation for three to six months. After this time warfarin is discontinued unless other factors such as recurrent pulmonary emboli are present. Recurrent pulmonary emboli may be treated surgically by clipping off the inferior vena cava to trap emboli before they reach the lungs.

All three patients reported here returned to running and had no further problems. They are presented

to remind those dealing with athletes to be aware of more serious problems which may be missed when seemingly common problems present themselves.

References

1. Ali MS, Kully MS, Corea JR. Deep vein thrombosis in a jogger. *Am J Sports Med* 1984; 12 (2): 169
2. Harvey JS Jr. Effort thrombosis in the lower extremity of a runner. *Am J Sports Med* 1978; 6: 400-2.
3. Mackie JW, Webster JA. Deep vein thrombosis in marathon runners. *Phys Sports Med* 1981; 9: 91-6.
4. Sidler GJ, Bugaieski SM, Sunderlin J, Weltman A. Difficulty in diagnosing and treating deep vein thrombosis in a competitive basketball player. *Phys Sports Med* 1985; 13(7): 113-18.
5. Cyriax J. *Rheumatism and Soft Tissue Injuries*. London: Ballière Tindall & Cassell Ltd. 1947.