Calf Pain in Runners May be Caused by Venous Insufficiency

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Abstract

Sportsman complaints in the legs are most often associated with diseases and/or trauma of the musculoskeletal system. More rarely disturbances of the vascular system, e.g., popliteal artery entrapment have been reported in sportsman. Venous entrapment or venous claudication is mainly observed in cases of deep venous thrombosis.

We report a case of venous claudication in the right leg of a sportsman (long distance runner) without any history of venous thrombosis who presented himself to the Praxisklinik Sauerlach. After running one to two km the man had to stop running due to increasing numbness in the lower leg, aching muscles in the calf and finally pain.

An orthopaedic evaluation including magnetic resonance imaging of the leg by two orthopaedic specialists did not reveal any disturbance in the musculoskeletal system being responsible for the pain.

At the first clinical evaluation in ambulatory surgery clinic in Sauerlach there were no visible signs of varicose veins in the legs. B-mode and duplex-sonographic investigation of the right leg revealed an enlarged (0.63 cm) insufficient sapheno-popliteal junction with reflux in the right leg, the investigation of the venous system in the left leg was normal. A popliteal artery entrapment was excluded by colour duplex sonography. The operative procedure, ligation of the sapheno-popliteal junction with segmental saphenous vein stripping, has been well tolerated.

2-3 weeks after ligation of the sapheno-popliteal junction and segmental saphenous vein stripping the patient resumed his running program and could run without any painful disturbances.

Conclusion: Athletes, e.g., runners with complaints in the leg should be investigated for musculoskeletal defect but also for vascular diseases, e.g., small saphenous vein insufficiency. The choice of treatment is ligation of the sapheno-popliteal junction with segmental saphenous vein resection which gives the patient optimal results and allows practicing long-distance running shortly after the operation.

Introduction

Pain in the leg is quite often found in athletes practicing long distance running, soccer or field and track. Normally it should not be a problem to find the cause of pain by physical examination and history taking. But it may be appropriate in certain cases to have a neurological, orthopaedic or vascular examination. We have demonstrated that groin hernia with nerve entrapment may be a cause of leg and/or groin pain in athletes (Holzheimer and Gresser 2007). The term popliteal-entrapment syndrome has been coined by Love and Whelan in 1965 to describe a singular constellation of neuromuscular and ischemic symptoms of the lower extremity (Love and Whelan 1965). A change of the anatomical location of the popliteal artery with a medial displacement caused by the gastrocnemius muscle has been identified as cause of these symptoms (Insua et al. 1970). Intermittent claudication that is normally associated with arterial disease may be rarely diagnosed to be of venous origin (Provan et al. 1979). Intermittent claudication has been described as a pain syndrome of the thigh or leg together with entrapment symptoms and a restriction of flow in the iliac or femoral vein in case of physical activity (Cockett et al. 1967; Bjordal 1970; Killewich et al. 1984; Negus and Cockett 1967; Raju and Fredericks 1991). It has been accused to be the least investigated complication of deep venous thrombosis (Delis et al. 2004).

Case Report

A male sportsman (long-distance runner) complained of numbness, muscle aching and pain in the right calf after running one kilometre. There was no history of trauma or deep vein thrombosis. He was first examined by an orthopaedic surgeon who thought the right knee may have a defect. In the magnetic resonance imaging examination an already known lesion of the anterior part of the meniscus was demonstrated. As there were no other lesions visible and the clinical symptoms were not related to the meniscus lesion the orthopaedic surgeon did not recommend a surgical treatment of the knee. This decision has been supported by another orthopaedic examination.

History and clinical examination of the lower extremities did not indicate the presence of arterial disease, history of deep vein thrombosis or neurological disease. B-Mode and duplex-sonographic examination of the legs revealed an enlarged (0.63 cm) insufficient sapheno-popliteal junction in the right calf; the investigation of the left leg was normal. There were no signs of an old or acute deep vein thrombosis in both legs. The duplex-sonographic test for popliteal artery entrapment was negative.

A ligation of sapheno-popliteal junction and a segmental inverse saphenous vein stripping was per-
formed in the Praxisklinik Sauerlach. The small saphe-
nous vein was macroscopically enlarged, the histologi-
cal examination showed a phlebosclerosis. The post-
operative follow-up was uneventful. 2-3 weeks after
the operation the patient started to do the long dis-
tance running again – without painful interruptions.  
Follow-up B-mode and duplex-sonographic evaluation
showed a normal venous system in the right leg with a
closed sapheno-popliteal junction. The patient is now
ten months free of symptoms and enjoys his long dis-
tance running without any painful disturbances.  

**DISCUSSION**

Venous claudication has been detected in 8% of pa-
tients with chronic venous insufficiency after deep
vein thrombosis (Labropoulos et al. 1997). The inci-
dence of 43.6% venous claudication in patients after
deep vein thrombosis as reported by Delis et al. in
2004 underscores the significance this disease may
have.

The differential diagnosis of pain in the lower ex-
tremity in athletes includes venous aneurysms (Hall-
stensson et al. 2005), trauma of the musculoskeletal
system, tibial stress syndrome, stress-fracture, exercise-
associated compartment syndrome or less often
radiculopathy, lumbosacral spinal stenosis, focal nerve
entrapment, popliteal artery entrapment or arterial
occlusive disease (Fredericson and Wun 2003; Mozes
et al. 1975). A rare pathogenesis of claudication is the
cytic degenerative disease of the adventitia of the
popliteal artery (Baron et al. 1993). Chronic compart-
ment syndrome is caused usually by overstraining in
athletes, mostly long distance runners; however, it
does not respond to protection, anti-inflammatory
medication and physiotherapy (Turnipseed et al. 1989).

The clinical symptoms of our patient correspond to
the symptoms reported by Provan (1979). The venous
claudication stands out by pain in the calf, which can
be so intensive, that the patient is forced to sit down.
The physical examination usually shows no sign of ar-
terial occlusive disease. Patients are often young and
had sustained a deep vein thrombosis in the past. Some-
times the patient is able to localize exactly the pain. If
the patient is stressed until the maximum ca-
pacity varicose veins may be demonstrated. Insuffi-
ciency of perforating veins has been accused to cause
this syndrome (Provan et al. 1979). As the patients
symptoms started after one kilometre we were unable
to do a provocation test.

The diagnosis of venous claudication has been main-
ly confirmed by plethysmography, treadmill, phle-
bography and Doppler sonography (Brülisauer et al.
1987; Walker et al. 1985; Baumgartner and Bollinger
1991). In several studies it has been demonstrated the
there is a good correlation between clinical classifica-
tion and venous reflux (Lin et al. 2004; Labropoulos et
al. 1996). Actually there is no gold standard available
to determine the extent of a venous drainage (Neglen et
al. 2000; Delis et al. 2004). The duplexsonography re-
mains the most important method to diagnose venous
insufficiency and popliteal artery entrapment
(Labropoulos and Leon 2005). The arterial entrapment
has been excluded; however, there were signs of reflux
and venous insufficiency in the small saphenous vein,
which may lead to the symptoms reported by this pa-
tient. Long-term venous hypertension can cause long-
term morphological damage in the skeletal muscle,
which may then be followed by atrophy, denervation
and myopathy (Taheri et al. 1984). Occlusion of the ili-
ac vein and venous claudication may be associated with
increased intra-muscular pressure, increased deposit of
water in the muscle, increase in lactate and diminished
blood flow (Ovarford et al. 1984).

Several authors recommended a fasciotomy to get
rid of the increased muscular pressure (Ovarford et
al. 1984; Snook 1975). Others emphasized a structured
training of the calf muscles for 6 months (Padberg et
al. 2004). Several investigators preferred to do a surgi-
tical treatment of the superficial varicose veins (Ting et
al. 2001; Lin et al. 2004). In this presented case the lig-
ation of the sapheno-popliteal junction with a seg-
mental inverse varicose vein stripping, causing no pain
or loss of quality of life to the patient, has been suc-
cessful in the elimination of the symptoms of venous
claudication and allowed the patient to start with his
long-distance running only 2-3 weeks after the proce-
dure.

**CONCLUSION**

Pain in the lower extremities of athletes may not only
be caused by musculoskeletal alterations but may be
associated with venous claudication caused by small
saphenous vein insufficiency. Treatment of choice can
be the ligation of the sapheno-popliteal junction with
segmental stripping of the saphenous vein. The pa-
tient can take up his running program shortly after the
successful operation.

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