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Acute proximal deep vein thrombosis: presentation in a chiropractic office

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The diagnosis of acute proximal deep vein thrombosis (DVT) can be difficult to make on the basis of clinical findings alone. Since it may be encountered by all clinicians, chiropractors must be aware of the often confusing clinical picture with which it may present. In its early stages patients may present with posterior thigh, calf and groin pain, symptoms that may mimic other types of biomechanical disorders. Because 50% of patients with DVT may develop life threatening thromboembolism, early detection and appropriate referral is crucial. To highlight the clinical presentation of DVT and the phenomenon of "silent embolism" the case of a 58-year-old male presenting to a chiropractic office for assessment and treatment of low back and leg pain is presented. The prevalence, etiology and risk factors associated with its onset are reviewed. Physical examination findings, diagnostic imaging and treatment are discussed. Considerations in the chiropractic management of the post-thrombolytic patient are highlighted.
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KEY WORDS: deep vein thrombosis, thromboembolism, spinal manipulation, chiropractic.

Il peut s'avérer difficile d'établir le diagnostic de la thrombose veineuse profonde aiguë proximale en se basant uniquement sur les résultats cliniques. Étant donné que tous les cliniciens peuvent être confrontés à ce diagnostic, les chiropraticiens doivent être conscients qu'ils peuvent faire face à un tableau clinique souvent confus. Au stade précoce, le patient peut souffrir d'une douleur à la cuisse postérieure, au mollet et à la hanche et présenter des symptômes similaires à d'autres types de troubles biomécaniques. Le repérage précoce de la thrombose veineuse profonde et l'orientation du sujet vers un spécialiste s'avèrent essentiels étant donné que dans 50 pour cent des cas, cette maladie évolue en thromboembolie. Le cas d'un homme de 58 ans se présentant à un chiropraticien afin d'évaluer et de traiter ses douleurs du bas du dos et des jambes souligne le tableau clinique de la thrombose veineuse profonde et du phénomène de l'embolie asymptomatique. On analyse la prévalence, l'étiologie et les facteurs de risque reliés à l'apparition des premiers symptômes. On examine le résultat de l'examen physique et la lecture de l'image diagnostique. L'observation des soins chiropratiques prodigués au patient post-thrombolytique est soulevée.
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MOTS-CLÉS : thrombose veineuse profonde, thromboembolie, manipulation vertébrale, chiropratique.

Introduction

The incidence of deep vein thrombosis (DVT) has been reported to be as high as 2.5 million cases per year in the U.S.A. alone.[1] While DVT in and of itself can be a painful condition, it is the risk of pulmonary embolism that makes early detection of the condition important. It is estimated that 95% of all pulmonary emboli occur as a result of DVT[2] with 30% being fatal.[3] As many as 50% of patients with DVT have been shown to have experienced asymptomatic "silent embolism" on subsequent ventilation perfusion scanning of the lungs.[4]

The diagnosis of DVT can be difficult to make on the basis of clinical signs and symptoms alone.[5] In its early stages patients can present with symptoms of calf, thigh, groin and buttock pain. Because these symptoms are non-specific for a wide variety of biomechanical disorders, chiropractors should anticipate DVT to be a possible differential diagnosis in patients presenting with radiating leg pain. If the mortality and morbidity associated with thromboembolism secondary to DVT is to be minimized, early recognition and timely referral for appropriate treatment is necessary.

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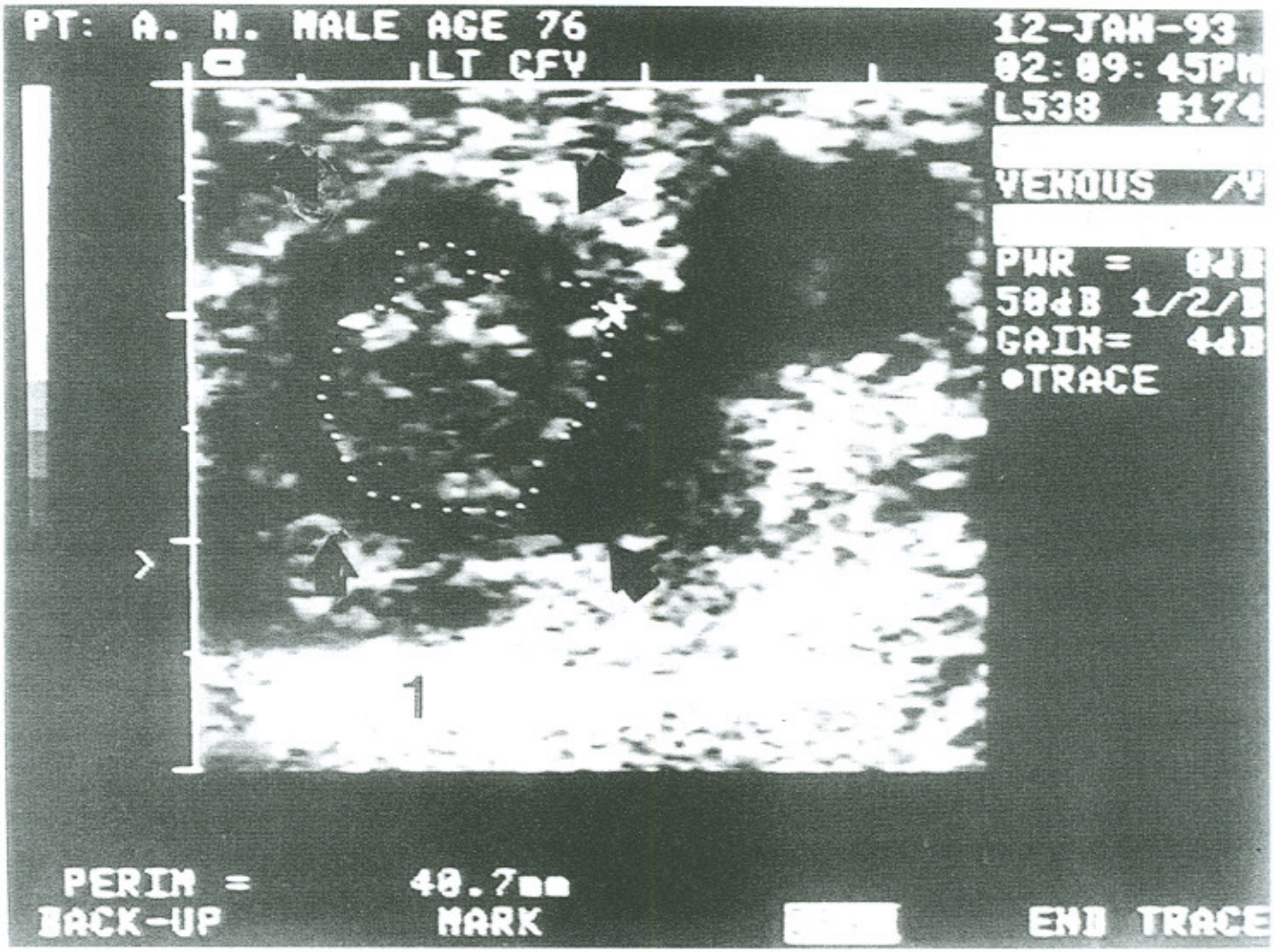

Figure 1 Ultrasound of the left femoral vein (small arrows) demonstrating complete occlusion by a thrombus (dotted margin).

To highlight the often inconclusive physical findings of patients with early DVT and the phenomenon of "silent pulmonary embolism," we present the case of a 58-year-old male presenting to a chiropractic office whose major complaint was low back and leg pain. The etiology, risk factors and the normal venous anatomy of the lower limb as it relates to symptom variations and examination findings are reviewed. The most sensitive diagnostic imaging techniques, current medical treatment and considerations in the chiropractic management of the post-thromboembolytic patient are discussed.

Case presentation

A 58-year-old male presented to a chiropractic office complaining of right buttock, groin, posterior thigh and leg pain of one day duration. The pain, described as severe, dull and constant had developed insidiously and was reported to be increasing in intensity. The pain was aggravated by walking and relieved by rest. The patient's past health history included several incidents of "sciatica" which had responded well to previous chiropractic management. Prostatic carcinoma, diagnosed two years previously, had been treated surgically.

On examination, the patient appeared to be healthy and in good physical condition, but ambulated with a right sided limp. Visual inspection and postural assessment of the low back and limbs were unremarkable. Palpation demonstrated tenderness over the right sacroiliac joint, gluteal region and posterior calf. The right piriformis and gastrocnemius muscles were hypertonic and tender to the touch. Range of motion of the lumbosacral spine, hip

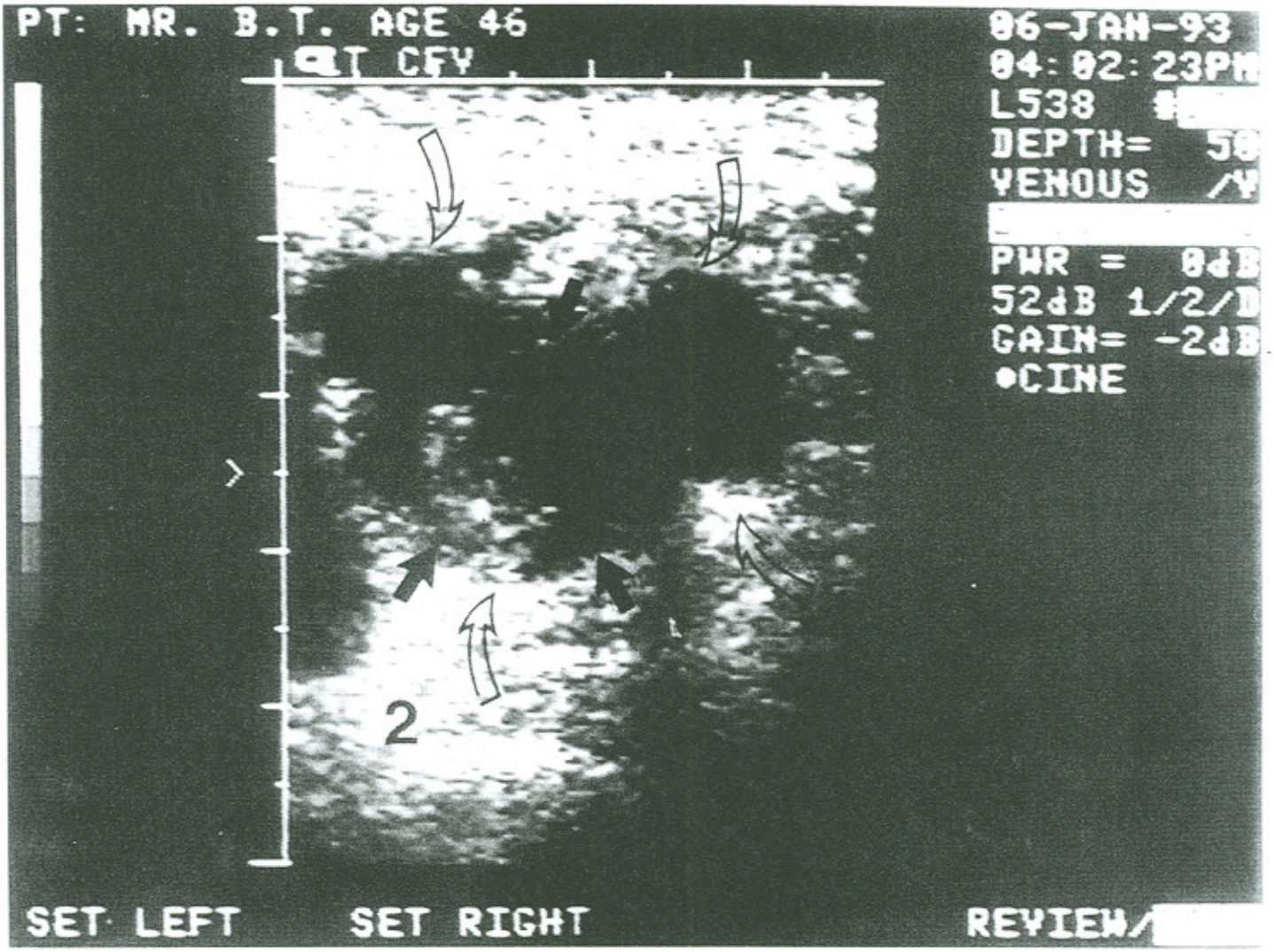

Figure 2 A thrombus (small arrows) can be seen partially occluding the femoral vein (open arrows).

and knee were full and pain free. Peripheral pulses were full and brisk bilaterally.

Neurological examination was negative. Deep tendon reflexes were normal (++/++), muscle strength testing 5/5, with no evidence of sensory deficit. Plantar responses were downgoing. Orthopaedic assessment of the lumbar spine and lower extremities was negative. Sacroiliac joint compression test elicited pain in the right sacroiliac joint.

Based on the history and limited physical findings, a provisional diagnosis of right sacroiliac joint syndrome was made. Gentle manipulation and mobilization was applied to the right sacroiliac joint. The patient was advised to rest, and recommended to return for further treatment the next day.

Upon presentation the following day, the patient's condition had deteriorated. He exhibited great difficulty walking and was visibly distressed. The pain had increased in intensity through the night making sleep difficult. Re-examination of the lower limb revealed marked swelling and erythema of the right foot, leg and thigh to a level three inches above the knee. The superficial veins were moderately dilated and tenderness was elicited on squeezing of the calf. Passive dorsiflexion of the right foot with extension of the knee (Homan's sign) reproduced the pain in the right calf. The right lower limb was palpably warm when compared to the left. Upon further questioning, the patient recalled experiencing a brief episode of severe, immobilizing chest pain several days prior to the onset of low back and leg pain, which resolved spontaneously.

A provisional diagnosis of deep vein thrombosis was made.

The patient's physician was immediately contacted and the patient was referred and admitted to a nearby hospital. Doppler ultrasonography of the right leg revealed an 18–22 cm long femoral vein thrombosis. Contrast radiography of the chest demonstrated pulmonary infarcts in the left lower lobe, lingula and the apex of the right lung secondary to thrombolytic emboli. The patient was administered intravenous anticoagulants and confined to a hospital bed with elevation of the leg for 8 days. Oral anticoagulant therapy was prescribed for six months at discharge.

On two week follow-up by the chiropractor, the patient continued to experience moderate leg pain, aggravated with activity, as well as persistent peripheral calf swelling and erythema. The patient reported continued discomfort in the lower back secondary to inactivity and was prescribed gentle stretching exercises to preserve lower back and limb flexibility. He was advised to gradually increase exercise according to pain tolerance throughout his convalescence.

Discussion

Physiologically, the three main factors associated with the development of DVT are venous stasis, abnormalities of the vessel walls and alterations in the blood coagulation system.[2] Clinical risk factors include left and right ventricular heart failure, fractures, lower extremity soft tissue injuries, chronic deep vein insufficiency, prolonged bed rest, carcinoma, fever, obesity and the use of oestrogen (ie oral contraception not hormone replacement therapy).[2,5,6] When these risk factors influence the formation of a platelet nidus, usually about the cusp valves of the deep veins, tissue thromboplastin is released and fibrinogen entraps the blood cells creating a thrombus. Most thrombi, if left untreated, will resolve spontaneously following a process of fibrinolysis and organization within 7–10 days. It is during the first two days following formation that the risk of free floating emboli is the greatest.[2]

The clinical presentation of DVT can vary greatly and represents a significant diagnostic challenge for all clinicians. Often patients present with leg pain, swelling, erythema, heat and a positive Homan's sign.[5] Interestingly, 50% of these patients who present with these signs and symptoms fail to demonstrate DVT on further imaging.[7] On the other hand, patients who do demonstrate evidence of DVT on further imaging, following the development of pulmonary emboli, are frequently entirely asymptomatic.[8] This wide variation in clinical presentation is due primarily to the normal anatomy of the venous system of the thigh and leg and the location of the DVT.[9] Typically the lower leg contains three major veins; the peroneal, anterior tibial and posterior tibial veins which drain superiorly into the femoral vein. When a thrombosis develops in one of the veins of the leg, the collateral drainage allows for the adequate return of venous blood and the patient often remains asymptomatic. When a thrombosis develops in the femoral vein, where the collateral drainage supplied by the great saphenous vein is minimal, venous return is markedly impaired. As in the case presented, patients will then characteristically demonstrate the signs and symptoms associated with acute proximal deep vein thrombosis: leg pain, swelling, heat and dilation of superficial veins.[9]

When DVT is suspected, further diagnostic imaging is necessary to confirm the presence and location of the thrombus. Contract venography and plethysmography, once extensively used, has been replaced by ultrasonography (Figures 1 and 2) because of its accuracy, cost effectiveness and lack of invasiveness.[10] MRI scans have also been shown to provide excellent images.[10]

Once the diagnosis of DVT has been established, treatment is directed toward reducing the development of emboli. To reduce the risk of dislodging emboli, intravenous anticoagulant therapy in conjunction with 14 days of hospital bed rest is recommended.[11] This initial therapeutic approach is followed by oral anticoagulants for up to six months.[9] When the thrombus has undergone fibrinolysis and organization, usually within 10 to 14 days, mild stretches and exercise can be employed, within patient tolerance, to improve circulation and minimize venous stasis.[11]

Prognosis for most patients is good. The risk of pulmonary embolism decreases from 50% within the first week to 30% within fourteen days.[11] Because the organization process destroys the patency of the venous valves, resulting in venous stasis and scarring of the vein surfaces, 10–20% of patients will develop a second DVT within one year.[12]

The case described above demonstrates the presentation of a patient with signs and symptoms most often associated with DVT. This patient had a history of prostatic carcinoma, a recognized risk factor for the formation of DVT's.[5] The recalled chest pain and shortness of breath were sequelae from pulmonary emboli which likely occurred two days prior to the onset of the DVT symptomatology. Appropriate chiropractic management of this patient encompassed a treatment program consisting of soft tissue therapy, mobilisation and mild stretching. The chiropractor in this case prudently abstained from manipulation due to the danger of intraspinal haemorrhage secondary to anticoagulation therapy.[13]

If chiropractors are to detect those patients who may be in the process of DVT formation, a thorough history and physical examination must be performed. Practitioners should be alert to the clinical risk factors that may place patients at risk for the development of DVTs. Specific questioning regarding transient chest pain and dyspnea, which may be suggestive of subclinical or silent pulmonary embolism, should be conducted.

In addition to a complete neurological and orthopaedic workup, special emphasis should be directed towards peripheral vascular examination of the lower limb. Femoral, popliteal, posterior tibia and dorsalis pedis pulses should be palpated bilaterally.[14] The circumference of the lower limbs should be measured bilaterally and compared to detect any swelling.[6] In some cases Homan's sign may ellicit a painful response, but this test has been shown to have little diagnostic efficacy.[5] If a DVT is remotely suspected, the patient should be referred for further assessment and treatment.

Conclusion

Patients presenting with lower extremity signs and symptoms atypical of biomechanical or musculoskeletal disorders should be carefully evaluated for peripheral vascular disease. The chiropractor should be aware of the clinical findings and risk factors associated with the diagnosis and development of deep vein thrombosis and understand that anticoagulant therapy in the post-thrombolytic patient is a contra-indication to spinal manipulation.

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