Case Report





Unilateral Leg Edema Not Cause by Deep Vein Thrombosis: 3 cases report

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Unilateral leg edema occurs for various reasons, including deep vein thrombosis (DVT), Baker's cyst, pelvic tumors, fractures, and cellulitis. Prompt diagnosis helps patients receive proper treatment and prevent treatment-related complications. Here, we report three patients with unilateral leg edema caused by Baker's cyst rupture, lymphedema, and iliac vein tumor compression.

Key words: venous thrombosis, Baker's cyst, pelvic tumor, lymphedema, unilateral leg edema

Introduction

Unilateral leg edema occurs for various reasons, including deep vein thrombosis (DVT), pelvic tumors, fractures, and cellulitis. The clinical presentations of these disorders may partially or completely overlap, leading to difficulty in distinguishing them from each other. Lack of an accurate diagnosis leads to incorrect treatment. Therefore, prompt diagnostic work-up is critical in patients with unilateral leg swelling and a high suspicion of DVT. Here, we report three cases of unilateral leg edema not due to DVT for differential diagnoses and discussion.

Case Report

Case 1: Baker's cyst rupture in osteoarthritis

A 91-year-old woman with hypertension

who could independently perform activities of daily living was admitted to the emergency department for right calf pain and right leg edema for ten days. The right thigh eventually became swollen, as well. She was afebrile, and her vital signs were stable at the time of hospital admission.

The laboratory findings showed a white blood cell (WBC) count of 14,870 cells/µl, Creactive protein (CRP) of 111.51 mg/L, alanine aminotransferase (ALT) of 27 U/L, serum creatinine of 0.92 mg/dL, and D-dimer of 2.57 mg/L. Urinalysis revealed no pyuria or bacteriuria. Because WBC and CRP levels were elevated, cellulitis of the right leg was considered; with antibiotic treatment, the values decreased compared to the initial ones. Because the D-dimer level was elevated, she had a high risk of DVT according to Wells' criteria for deep vein thrombosis; hence, administration of low-molecular-weight heparin was ordered.

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However, the edema and pain in the right leg showed little improvement during treatment. The result of the phleborheography (PRG) was within the normal range. The patient then underwent venous Doppler ultrasonography. No evidence of DVT in the lower extremity veins was detected, but a Baker's cyst with fluid extension causing popliteal vein compression was identified. Computed tomography (CT) showed a right Baker's cyst suspicious for recent rupture, and presence of contrast opacification from bilateral popliteal veins to bilateral common femoral veins (Fig. 1). Lowmolecular-weight heparin was discontinued to prevent bleeding. Her right leg edema showed no progression during anticoagulant treatment. Ultracet (Tramadol 37.5 mg/Acetaminophen 325 mg/tab) was prescribed for pain control with the impression of Baker's cyst rupture. The patient received conservative treatment at an orthopedic outpatient clinic after discharge.

Case 2: Lymphedema in prostate cancer

A 75-year-old man was diagnosed with prostate cancer with bladder invasion and underwent transurethral resection of the bladder tumor and radiotherapy four years ago. The radiotherapy dose was 76 Gy/38 fractions to the pelvis, and no radiation-related adverse effects



Fig. 1 Computed tomography shows Baker's cyst in the right popliteal region, 6.6 cm in size, suspicious of recent rupture.

were observed after the treatment. He received leuprolide 3.75 mg every three months, followed by antiandrogen medicine at the urology outpatient clinic. In the month prior to consult, he complained of right leg and thigh swelling for more than ten days. The urologist ordered a CT, which revealed a stable prostate size, urinary bladder wall, and right pelvic wall lymphadenopathy. The patient was referred to a cardiovascular outpatient clinic for further work-up.

The patient was afebrile and his vital signs were stable. Physical examination showed mild pitting edema in the right leg and skin thickening. The laboratory findings showed a WBC count of 4,740 cells/µl, serum creatinine of 0.77 mg/dL, and D-dimer of 0.73 mg/L. Because of the history of cancer, he had a high risk of DVT according to Wells' criteria. The patient initially received a non-vitamin K antagonist oral anticoagulant (NOAC). The result of the PRG was within the normal range. Venous Doppler ultrasonography revealed no evidence of DVT in the lower extremity veins. Because a systolic murmur was detected by physical examination, echocardiography was performed, which revealed severe aortic stenosis with an aortic valve area of 0.6 cm^2 . The patient also reported mild exertional dyspnea, and his B-type natriuretic peptide level was 56 pg/mL (normal < 100 pg/mL).

There was partial improvement of the patient's right leg edema after leg elevation at night, but recurred during the daytime. The above examination did not indicate DVT, and anticoagulant therapy was discontinued. Since lymphedema is a possible cause of unilateral leg swelling in cancer patients, a lymphoscintogram was performed, which revealed partial obstruction of lymphatic drainage in the right lower extremity (Fig. 2). Because of severe aortic stenosis and lymphedema stage 2, the patient was referred to a plastic surgeon for lymphovenous anastomosis (LVA), after discussion.



Fig. 2 Lymphoscintogram shows partial obstruction of lymphatic drainage in the right lower extremity.

Case 3: Iliac vein compression by tumor

A 57-year-old man with hypertension consulted for right leg swelling and erythema for one month. He was transferred to a cardiovascular outpatient clinic with the suspicion of DVT. The patient was afebrile, and had donated blood regularly in the past.

Physical examination showed bilateral leg and foot edema and erythema, which was worse on the right side. A scaly rash was observed on his feet. The laboratory findings showed a WBC count of 6,850 cells/µl, ALT of 21 U/L, serum creatinine of 0.75 mg/dL, and D-dimer of 0.49 mg/L. The result of the PRG was within the normal range. Since the D-dimer level and PRG did not support the diagnosis of DVT, cefadroxil 500 mg twice daily and topical antifungal medicines were prescribed for possible cellulitis and fungal infection of the feet. Echocardiography was performed for bilateral leg edema, which revealed a left ventricular ejection fraction of 65%.

After treatment with antibiotics for one week, his leg swelling and erythema showed no improvement. Antibiotics were discontinued and diuretics were titrated. Obstruction of the proximal venous system was suspected and required further examination. Pelvic CT was performed, which revealed a fat-containing right pelvic mass favoring liposarcoma. Enlarged lymph nodes in the right iliac and right inguinal regions, 4.6 cm in size, caused external compression of the right iliac vein and subsequent venous thrombosis (Fig. 3). A NOAC was prescribed for the right iliac vein thrombosis, even if the D-dimer level was within the normal range. The patient reported a right inguinal mass that had persisted for more than one month. This is a rare condition, and magnetic resonance imaging offers better image resolution. Magnetic resonance imaging revealed a lobulated fat-containing mass lesion with enhancing solid components, 18.2 cm in size, and enlarged lymph nodes producing external compression of the right iliac vein (Fig. 4). Treatment options were discussed with the urologist and oncologist, and they suggested debulking surgery for tissue diagnosis and subsequent adjuvant chemotherapy depending on the pathologic result. Leg edema minimally improved after anticoagulant administration; however, no complete remission was observed. The patient eventually decided to undergo surgery at a medical center.



Fig. 3 Computed tomography of pelvis shows a lobulated fat-containing tumor with solid components and enhanced septations and calcifications in the pelvis and partially herniated into the right inguinal canal. Enlarged lymph nodes in the right iliac and right inguinal regions, 4.6 cm in size, are seen, causing external compression of the right iliac vein and venous thrombosis.



Fig. 4 Magnetic resonance imaging shows a lobulated fat-containing mass, 18.2 cm in size, containing enhancing solid components, septations and calcifications in the pelvis and partially herniated into the right inguinal canal. The lesion produces a mass effect, resulting in a deviated urinary bladder. Enlarged lymph nodes and solid components in the right iliac and inguinal regions causes external compression of the right iliac vein.

Discussion

Baker's cysts are usually the result of osteoarthritis and cause a bulge behind the knee. They may be asymptomatic, but a ruptured Baker's cyst may cause pain and leg edema, which can be clinically indistinguishable from acute DVT. The most common complication of Baker's cysts is rupture, occurring in up to 50% of complicated cysts. Baker's cysts can sometimes lead to compartment syndrome if not properly diagnosed and treated.¹ Treatment of suspected DVT with anticoagulants can cause bleeding and worsen the prognosis of complicated Baker's cysts.² Venous Doppler ultrasound and CT help rapidly diagnose ruptured Baker's cysts and distinguish ruptured Baker's cysts from other diseases in patients with painful swollen legs before evaluation for DVT.³ With an accurate diagnosis, most patients with ruptured Baker's cysts respond well to conservative treatment.⁴

Lymphedema is a condition characterized by tissue swelling caused by obstruction of the lymphatic system. Lymphedema is a frequent complication of cancer treatment, and the incidence of cancer-related lymphedema ranges from 5% to 83% in various cancers.⁵ A sizable proportion of cancer-related lymphedema patients have problems of underdiagnosis and undertreatment.⁶ Venous Doppler ultrasonography can help rule out other causes of tissue edema. Lymphoscintigraphy showed that the radioactive dye had moved through the lymph vessels and highlighted the obstructions. CT and magnetic resonance imaging revealed the size and number of the lymph nodes. Lymphedema is not a life-threatening disease, but can lead to negative psychosocial impact and social isolation in affected individuals.⁷ Decongestive treatment with compression stockings, skin care, and manual lymphatic drainage partially relieve the tissue swelling. Surgical intervention, including vascularized lymph node transfer surgery and lymphaticovenous anastomosis, may be recommended if a patient responds poorly to decongestive treatment. Prompt diagnosis will help patients receive proper treatment and improve their quality of life.

A normal D-dimer level excludes acute DVT when combined with a low pretest probability; however, D-dimer cannot be used to exclude DVT without an assessment of pretest probability.⁸ A normal D-dimer level can sometimes be observed in outpatients with distal DVT. Venous Doppler ultrasound excludes most deep vein thromboses from the common femoral vein to the distal venous system, but more central venous thromboses cannot be excluded. An ovarian pelvic mass should be considered as an obscure cause of asymmetric leg edema. Pelvic tumors or lymphadenopathies in patients with cancer cause iliofemoral venous obstruction due to external compression, which sometimes leads to venous thrombosis.⁹ Combination therapy with anticoagulants and systemic therapy is mandatory for these patients, since anticoagulant therapy alone is usually ineffective.

Conclusions

DVT, lymphedema, Baker's cyst, pelvic tumor, and cellulitis should be considered as causes of unilateral leg edema. A prompt diagnostic work-up to identify the cause of unilateral leg swelling is important to prevent treatment-related complications. Prescribing anticoagulants owing to inaccurate diagnosis can lead to serious complications. D-dimer, venous ultrasound, CT, and lymphoscintograms are useful imaging tools to aid in diagnosis.

Author Contributions

Concept or design: HHsing-Shan Tsai, Thung-Lip Lee, Chen-Feng Hsuan and Huai-Wen Liang; Acquisition of data: Hsing-Shan Tsai; Analysis or interpretation of data: Hsing-Shan Tsai, Thung-Lip Lee, Chen-Feng Hsuan and Huai-Wen Liang; Drafting of the article: Hsing-Shan Tsai; Critical revision for important intellectual content: Hsing-Shan Tsai, Thung-Lip Lee, Chen-Feng Hsuan and Huai-Wen Liang.

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Conflicts of Interest

The authors declare no conflict of interest.

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