Development of Complex Regional Pain Syndrome and Left Femoral Nerve Entrapment After Multiple Revascularization Surgeries for Critical Limb Ischemia

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Introduction

This patient is a 41 year old woman with history of depression and recurrent DVT's who initially presented to the ED in 2018 with left leg pain, numbness and weakness. CT angiogram revealed thrombus within the descending thoracic aorta, and emboli within the left femoral artery, anterior tibial and peroneal arteries and dorsalis pedis artery. She underwent numerous vascular procedures over the next six months for critical limb ischemia. During the next several months she developed pain in the left leg. She was seen and evaluated in the pain management clinic.

Case

41 year old female with history of recurrent DVT's initially presented to the ED in 2018 with left leg pain, numbness and weakness. CT angiogram (Fig. A) revealed thrombus within the descending thoracic aorta, and emboli within the left femoral artery, anterior tibial and peroneal arteries and dorsalis pedis artery. She underwent aortoiliac, left superficial femoral, profunda femoral, and tibial artery cutdown. In early 2019 she presented with left leg pain and was found to have critical limb ischemia. She underwent a second procedure including arteriogram, balloon angioplasty, pseudoaneurysm repair, and tPA catheter insertion. She had recurrence of critical limb ischemia in August 2019 and underwent a third procedure including recanalization and balloon angioplasty.

Over the next few months, she developed worsening numbness, burning pain of the left leg, as well as gait disturbance. Physical exam revealed pallor, coolness, and allodynia, along with diminished light touch sensation of the anterior thigh. Musculoskeletal exam revealed weakness of the left knee extensors as well as an antalgic gait with limited left hip excursion

Results

CT angiogram (Fig. A) revealed thrombus within the descending thoracic aorta, and emboli within the left femoral artery, anterior tibial and peroneal arteries and dorsalis pedis artery.

MRI thigh (Fig. B) confirmed femoral nerve entrapment at the site of her left anterior groin scar tissue causing edema and denervation of the vastus medialis and sartorius. She was diagnosed with type 2 complex regional pain syndrome secondary to her multiple revascularization procedures.

Imaging

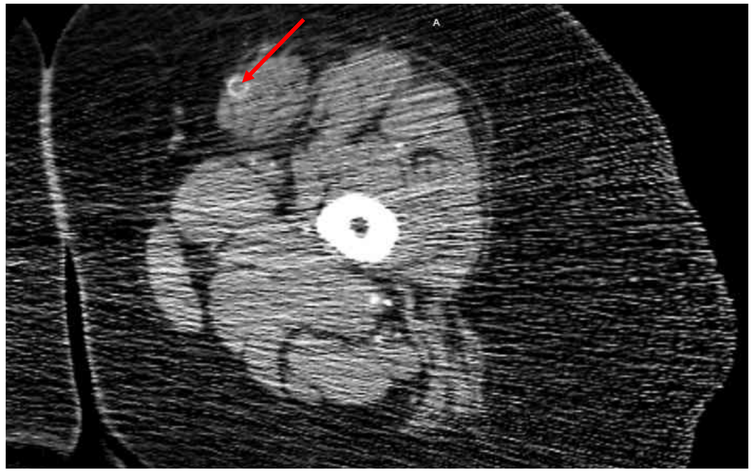

Fig. A: CT Angiogram Lower Extremity, arrow pointing to femoral artery occlusion

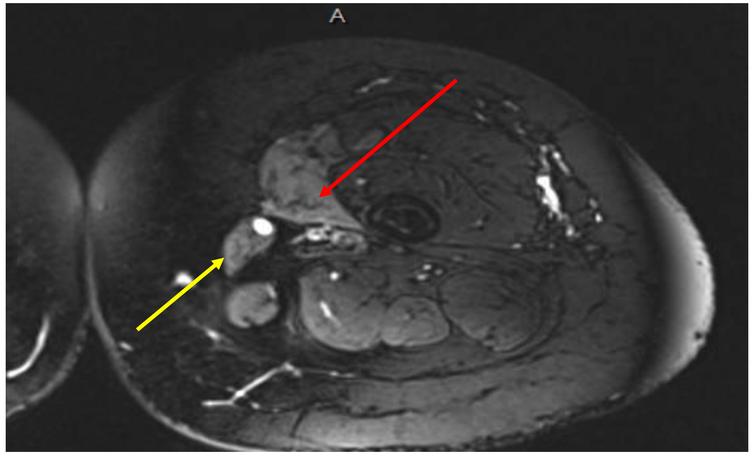

Fig. B: T2-Weighted MRI Thigh, red arrow pointing to edematous vastus medialis and yellow arrow pointing to edematous sartorius, secondary to femoral nerve entrapment and denervation

Discussion

This case presents a potential complication of revascularization surgeries. Likely due to the repeated inguinal access and eventual scar formation, the patient developed entrapment and neuropathy of the femoral nerve and ultimately progressed to complex regional pain syndrome.

CRPS is typically diagnosed using the Budapest Criteria, which incorporates findings of pain, sensation, vasomotor, sudomotor, and trophic changes. Treatments for CRPS include physical therapy, psychological counseling, pharmaceuticals, and procedural interventions. Typical pharmaceutical options include NSAIDs, tricyclic antidepressants (amitriptyline, nortriptyline), gabapentin, SNRI's, and bisphosphonates. Non-pharmacologic options include physical therapy and modalities such as paraffin baths, mirror therapy, and electrical stimulation. For those who do not adequately respond to medications and modalities, procedures that may help with CRPS include trigger point injections, sympathetic nerve blocks, and spinal cord stimulators.

Chronic use of opioids for treatment of CRPS is typically not preferred. As this patient has history of depression and suicidal ideation, it was avoided as studies show prescription opioid misuse is significantly associated with suicidal ideation, suicidal planning, and suicidal attempts.

Conclusion

This case demonstrates the development of CRPS in a 41 year old woman due to femoral nerve entrapment after multiple revascularization procedures. Complex regional pain syndrome is a complicated, chronic pain condition that can occur after an injury or trauma. Symptoms can vary however they usually include pain, paresthesias, vasomotor changes, and skin trophic changes. Her exam, months after surgery, revealed cool, pale skin with vasomotor changes, as well as paresthesias and allodynia. Her muscle strength was significant for quadriceps weakness which correlates with demonstrated femoral nerve entrapment on MRI. She continues to work with physical therapy to work on strength, function and mobility. Overall, revascularization surgeries have gotten safer and more effective over time, however this case demonstrates that CRPS remains a potential complication that must be considered.

References