Neurology Case Series

Vol 5 | Issue 24 | 2024

Dear Doctor,

Greetings from Micro Labs Limited.

We are happy to bring you "Neurology case series", which contains latest and interesting cases in the field of Neurology.

This issue contains

1. **Case report on adult-onset Alexander disease with external laryngeal tremor**
2. **An uncommon case of giant retinal astrocytoma in a young female patient with tuberous sclerosis**
3. **Case report on ventral brainstem neurenteric cyst**
4. **A Rare Case of Acute Leriche Syndrome mimicking Spinal Cord Infarction**

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Looking forward to your valuable feedback

Best Regards,

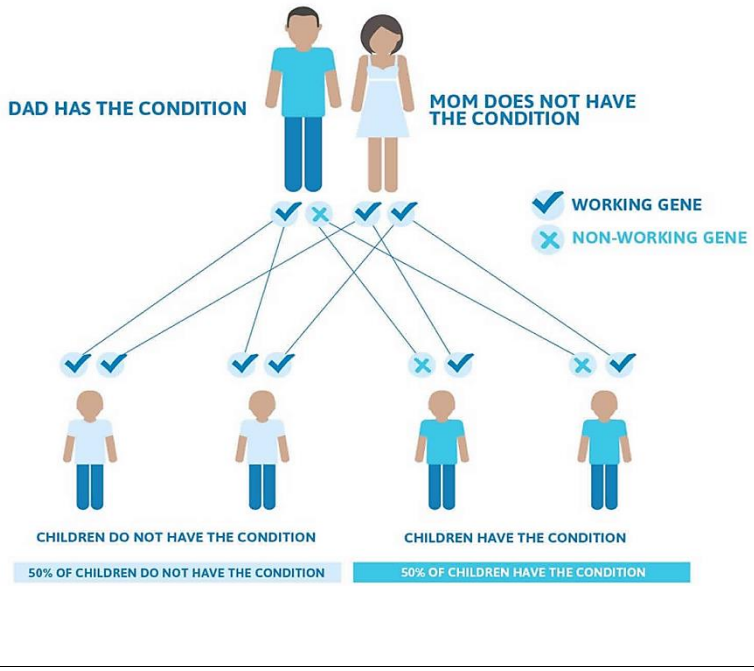
Medical Team,

1. Case report on adult-onset Alexander disease with external laryngeal tremor

Introduction:

The glial fibrillary acidic protein (GFAP) gene is mutated in Alexander disease.

Alexander disease (AxD) is a severe neurological condition caused by de novo mutations in the type III intermediate filament protein glial fibrillary acidic protein (GFAP), which is mostly expressed in astrocytes. These mutations result in neurodegeneration, astrocyte dysfunction, and aggregation of GFAP. Together with vimentin, GFAP forms the cytoplasmic intermediate filament network of mature astrocytes.[1] Clinical symptoms differ based on age at onset, progression is gradual, and there is no curative treatment. The diagnosis depends on the presence of pathogenic variants in GFAP or aberrant astrocytes, also known as Rosenthal fibers. There are no reports of external laryngeal tremor in adult-onset Alexander disease (AOAxD).[2] The purpose of this study was to present one case and examine the literature on palatopharyngeal tremor with AOAxD.



Alexander disease autosomal dominant inheritance pattern

Case Presentation:

A 43-year-old man had involuntary movements in the front of his neck for the past two years. After a long period of lecturing, he also noticed a spasmodic, faltering voice. He denied experiencing any neurologic symptoms, including dyspnea, dysphagia, tinnitus, or ear popping. Upon closer examination, the laryngeal skeleton was shown to be moving continuously and rhythmically. The accompanying video footage also shown synchronized

contractions of the tongue, soft palate, and pharyngeal walls. Upon evaluation, there was dysmetria in the heel-to-shin maneuver and tandem gait was restricted to two steps. There was scandid dysarthria and horizontal nystagmus induced by lateral gazing. A fiberoptic laryngoscopic examination shown that the soft palate, tongue, and epiglottis moved vertically in a rhythmic and continuous manner. The video recording also showed adduction of the pharyngeal walls, arytenoid cartilages, and vocal cords, all without obstructing the airway during respiration or phonation. Pharmacological therapy was not recommended due to minor symptoms. Out of three male siblings, the patient was the eldest. His late father had a degenerative disease that caused behavioural abnormalities, and at another hospital, a paternal aunt and uncle were found to have unidentified etiology cerebellar ataxia. Testing on other family members was not possible, but his mother and younger brother were both asymptomatic and had normal neurological tests. A MR scan revealed cerebral periventricular white matter and the dentate nuclei's hila to be hyperintense, along with atrophy of the medulla oblongata and a normal ventral pons. Figure 1 illustrated spinal MR findings of cord atrophy and hyperintense gray matter. The geniohyoid and thyrohyoid muscles recorded synchronous contractions at 2 Hz using surface electromyography. A heterozygous missense mutation in GFAP's exon 6 was identified using whole-exome sequencing. The gene was identified as pathogenic in the ClinVar database, potentially pathogenic according to the American College of Medical Genetics standards, and not found in the gnomAD database. The patient's younger brother had the same GFAP mutation, but not his mother.

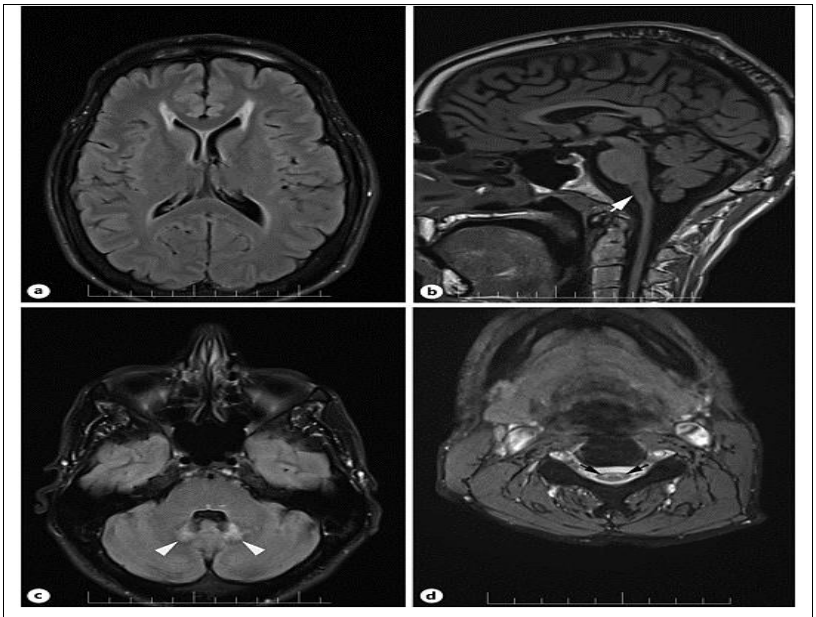


Figure 1. MR imaging of the spinal cord and brain. a) Periventricular hyperintensity in the brain. b) Cerebellar sulci enlargement and atrophy of the medulla oblongata (arrow), maintaining the ventral pons (tadpole sign). c) Dentate nuclei hila hyperintensity (arrowheads). d) Atrophy and hyperintensity of the cervical spinal cord's gray matter.

Discussion:

In this case, the first and most noticeable symptom was an external laryngeal tremor. Type II AxD had a variable rate of progress that did not impair survival, a lifetime onset that occurred mostly in the fourth decade, and a clinically milder course. Patients over 45 years old at onset showed more severe characteristics than those under 45 years old, however the disease duration in AOAxD was upto 22 years.[2] A previous study shown that the initiation occurred after the age of 65, there was a quick transition to dependence within two years.[3]

Conclusion:

The modest phenomenon of external laryngeal, palatopharyngeal tremor, and cerebellar ataxia was consistent with this mutation, which has been documented in isolation for the third time. Imaging showed the "tadpole sign," which was consistent with AOAxD.

Reference:

1. Viedma-Poyatos Á, González-Jiménez P, Pajares MA, Pérez-Sala D. Alexander disease GFAP R239C mutant shows increased susceptibility to lipoxidation and elicits mitochondrial dysfunction and oxidative stress. Redox Biol. 2022 Sep; 55:102415.
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2. An uncommon case of giant retinal astrocytoma in a young female patient with tuberous sclerosis

Introduction:

Tuberous sclerosis complex (TSC), commonly known as Bourneville disease, is a hereditary neurocutaneous condition that presents with multisystem involvement and multiple hamartomatous tumors. The classic clinical triad, known as the Vogt triad, consists of seizures, intellectual impairment, and facial angiofibromas. However, this triad occurs in less than 50% of cases.[1] TS affects approximately 1 in every 5000–10,000 people. Approximately one-third of cases have a favourable family history, with the rest being sporadic. Tuberous sclerosis is diagnosed based on clinical symptoms and genetic abnormalities. The most prevalent ocular symptoms are retinal astrocytic hamartomas, which typically have a maximum size of 0.5 to 5 mm, and an achromic patch. However, only optical symptoms—such as retinal astrocytic hamartomas and achromatic patches—are considered for diagnostic purposes. [2] This case study described a young female patient's uncommon presentation of tuberous sclerosis.

This case highlighted the significance of addressing tuberous sclerosis in patients experiencing seizures and ocular symptoms.

Case Presentation:

A 15-year-old female present to the emergency department after experiencing seizures intermittently for 3 months. These episodes were marked by tonic-clonic limb movements and loss of consciousness, indicating seizure activity. The patient had eyesight problems as well. The patient's vitals revealed a temperature of 37.3°C, a heart rate of 76 beats per minute, a respiratory rate of 15 beats per minute, a blood pressure of 130/80 mmHg, and an oxygen saturation level of 96%. There were maculopapular hyperpigmented skin lesions all over the patient's face. MRI of the brain revealed a significant round-to-oval enhancing tumor lesion. This lesion begins at the left lateral ventricle's antrum, which is located near the foramen of Monroe. On the T1-weighted image, the lesion displays a peripherally hyperintense configuration with core isointensity. On the T2 sequence, blooming was observed, indicating tubers with hyperintense lesions. A single ocular lesion, measuring roughly 1.2 ×1.3

×1.4 cm, was in the posterior region of the left globe. The lesion was heterogeneously hypointense in relation to the surrounding media. Retinal astrocytoma was diagnosed following the ophthalmologic consultation, despite the assessment being significantly hindered by unclear media. Only secondary postoperative alterations were visible during the traditional slit-lamp examination, providing little diagnostic data. Following the patient's first appointment with an ophthalmologist, a comprehensive diagnostic evaluation was conducted. This involved an ultrasonography (USG) of the abdomen, a second ophthalmologic examination, and contrast-enhanced computed tomography (CECT) scans of the brain, orbit, thorax, and abdomen. CECT and orbital imaging confirmed previously observed contrast-enhanced magnetic resonance imaging (CEMRI) brain findings, indicating the presence of the identified lesions. Interestingly, two lung lesions associated with lymphangioleiomyomatosis (LAM) were seen during the CECT thorax assessment (Figure 1), raising questions regarding possible systemic involvement. Furthermore, a single lesion compatible with a left renal angiomyolipoma was seen on the CECT abdomen. Additionally, the USG KUB examination revealed a single hyperechoic round to oval lesion in the left kidney's interpolar cortex that measured about 12 × 9 mm and showed internal vascularity, strongly indicating the presence of an angiomyolipoma. Furthermore, the contralateral renal cortices showed several small (2–3 mm) round to oval variable-sized

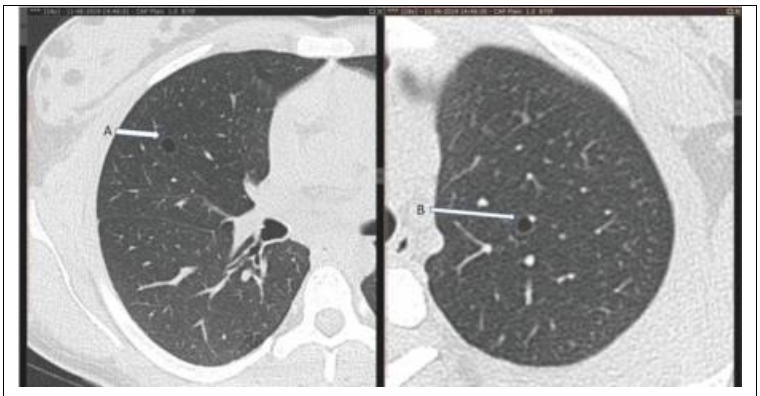


Figure 1: CT thorax revealing cystic lesions in the lateral segment of the right middle lobe (A) and the apical-posterior segment of the left upper lobe (B).

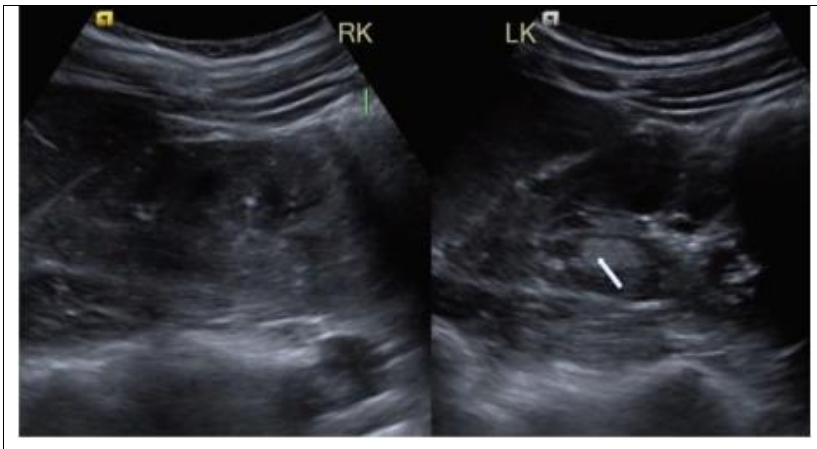


Figure 2: Left kidney ultrasonography (USG) showing many minor (2–3 mm) echogenic foci on both sides, as well as a single hyperechoic angiomyolipoma (white arrow) in the interpolar cortex and possible smaller angiomyolipomas.

echogenic foci, which most likely correspond to smaller angiomyolipomas (Figure 2). The patient was treated with antiseizure drugs, educated on lifestyle changes and sun protection, and scheduled follow-up appointments. This clinical presentation strongly suggested a diagnosis of tuberous sclerosis, a rare genetic disorder characterized by the development of benign tumors in various organs, including the brain, kidneys, lungs, and skin, given the cumulative findings of the cerebral, pulmonary, and renal manifestations.

Discussion:

Tuberous sclerosis complex (TSC) is an autosomal dominant genetic condition caused by pathogenic mutations in the TSC1 or TSC2 genes. Retinal astrocytic hamartomas are commonly associated with TSC; however, other potential causes include neurofibromatosis, retinitis pigmentosa, Leber's congenital amaurosis, and Best's disease. It can be difficult to distinguish them from illnesses that are similar, like retinoblastoma, chronic hyperplastic primary vitreous, or choroidal melanoma.[2] Glial fibrillary acid protein (GFAP) expression and disordered astrocytic growth are two characteristics of ocular retinal astrocytic hamartomas, which are unique masses inside the retinal nerve fiber layer.[3]

Conclusion:

This case demonstrated the importance of rule out tuberous sclerosis in patients who exhibit convulsions together with ocular symptoms and highlighted the importance of prompt diagnosis and adequate treatment in preventing complications and enhancing patient outcomes.

References:

1. Wang MX, Segaran N, Bhalla S, Pickhardt PJ, et al. Tuberous Sclerosis: Current Update. Radiographics. 2021 Nov-Dec;41(7):1992-2010.
2. Thakkar K, Raveena F, Kumar A, Mal D, et al. Giant Retinal Astrocytoma: A Case Report of an Uncommon Presentation of Tuberous Sclerosis in a Young Female. Case Rep Neurol Med. 2024 Apr 24;2024:5559615.
3. Salussolia CL, Klonowska K, Kwiatkowski DJ, Sahin M. Genetic etiologies, diagnosis, and treatment of tuberous sclerosis complex. Annual Review of Genomics and Human Genetics. 2019 Aug 31;20(1):217-40.

3. Case report on ventral brainstem neurenteric cyst

Introduction:

Neurenteric cysts are uncommon, benign tumors of the central nervous system that were initially identified in the the nineteenth century. Neurenteric cysts of the central nervous system account for 0.3-0.5 percent of spinal tumors. In children, neuraleric cysts of the posterior fossa are very rare.[1] They are assumed to develop in the third week of embryonic development following aberrant or delayed closure of the neurenteric canal, which serves as a channel for communication between endoderm and ectoderm via the notochord. When intracranial, they are either found by chance or after presenting with a range of symptoms, from headaches to cranial nerve or brainstem compression symptoms. Radiological diagnosis is challenging due to the cyst's changing protein composition, which causes variability in T1 and T2 MRI signals, as well as the presence of other comparable lesions. Limited follow-up data and the rarity of the disorder make it difficult to determine the optimum surgical management. Complete excision of the NEC, including the cyst wall, is normally recommended. But given the complexities of this site and the potentially dangerous removal attempt, a new strategy must be taken into consideration.[2] In the present case, a 10-year-old child's ventral NEC (near the BS) shown progressive growth on follow-up examinations.

The present case demonstrated the effective surgical excision of a rare congenital brainstem cyst.

Case Presentation:

A healthy 10-year-old girl experienced recurring occipital headaches for a year. The results of the neurological and physical exams were unremarkable. A tiny, spherical, hyperdense lesion was visible on head computed tomography imaging, and it was situated anterior to the pontomedullary junction. The lesion appeared extra-axial on MRI and was primarily hyperintense on T1 and T2/T2 fluid-attenuated inversion recovery, with facilitated diffusion, no gadolinium enhancement, no chemical-shift artifact (not a fatty lesion), and a small nodule within low signal on T1, T2, and T2*, suggesting calcification. The lesion was approximately 10 × 9 × 8 mm in size (anterior-posterior × transversal × craniocaudal) and had a volume of 280 mm^3. There was no surrounding edema and a little mass effect on the BS (Figure 1). At

first, a "watch and wait" approach was used because of the lesion's size and comparatively benign clinical signs. Following a conservative approach and regular brain MRIs, the lesion grew to 19 × 28 × 23 mm in size and 5400 mm^3 in volume, with a considerable mass effect. The prepontine vasculature was not enclosed, but it was shifted even further anteriorly. This led to the decision to undergo neurosurgical treatment. After positioning the patient laterally, a right retro mastoid craniotomy was performed, extending to the foramen magnum. The cyst wall was widely fenestrated, uncovered, and its fluid was drained to reveal a thick yellow liquid content under an operating microscope with assistance from neuronavigation. A portion of the cyst wall was removed following aspiration and extensive irrigation. There was no removal of the cyst wall portion adhering to the basilar artery and BS. The histologic results were consistent with the diagnosis of a benign endodermal cyst, showing a pseudo-stratified epithelium without anaplasia. The patient did not report any neurological changes during the procedure, and the postoperative MRI revealed that the cyst had completely drained and that a small T2 hypointense nodule was still present. The patient remained healthy, active, and symptom-free at the one-year follow-up, and imaging revealed no signs of the lesion's recurrence (Figure 2).

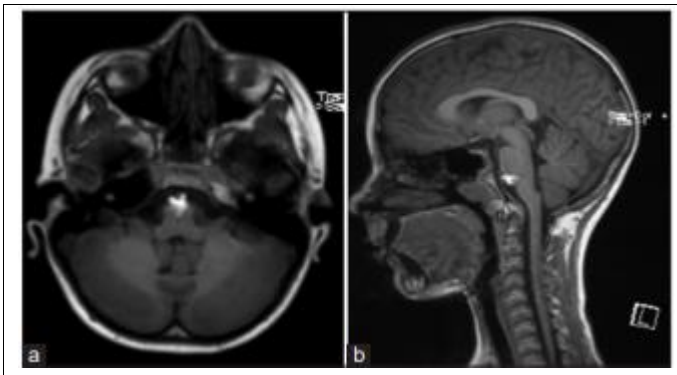


Figure 1. Magnetic resonance imaging of the brain during diagnosis. A spontaneously hyperintense mass can be seen anterior to the pontomedullary junction on (a) axial T1 and (b) sagittal T1.

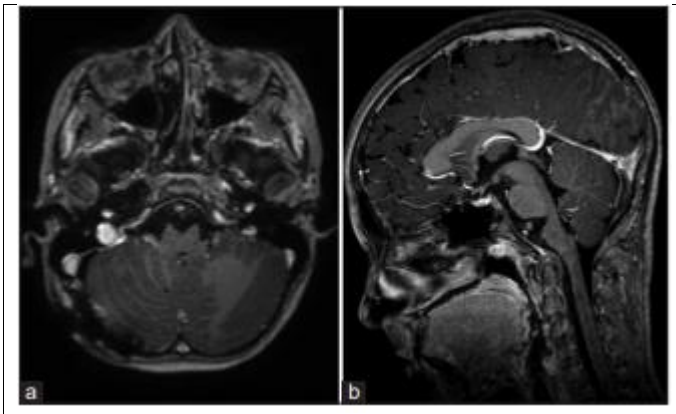


Figure 2. Postoperative T1 sequence brain magnetic resonance imaging with gadolinium (a) axial view and (b) sagittal view demonstrating resolution of the mass impact on the brainstem and no visible residual cyst.

Discussion:

Intracranial NEC is responsible for 0.01% of central nervous system malignancies. A long follow-up is advised since age under 30 was associated with a higher risk of recurrence, even if a 1-year

follow-up MRI revealed no indications of recurrence.[2] A previous study found that ineffective resection was related with a greater cyst recurrence rate. For NEC in general, recurrence rates have been recorded to reach up to 37% over a period of weeks to 14 years.[3]

Conclusion:

This case study described a rare congenital cyst in the ventral brainstem that was successfully treated surgically. It also includes pre- and post-operative imaging results, intraoperative microscopic images of the surgery.

References:

1. Menezes AH, Dlouhy BJ. Neurenteric cysts at foramen magnum in children: presentation, imaging characteristics, and surgical management-case series and literature review. Childs Nerv Syst. 2020 Jul;36(7):1379-1384.
2. Lemos SS, Sá MI, Casimiro CD, Guerreiro C, Faria C. A ventral brainstem neurenteric cyst - A case report and review of the pre-brainstem location. Surg Neurol Int. 2024 Jun 7;15:195.
3. Agresta G, Sokol D, Kaliaperumal C, Kandasamy J, Gallo P. A novel management proposal for intrinsic brainstem neurenteric cysts: case report. J Neurosurg Pediatr. 2019 Oct 18;25(1):83-87.

4. A Rare Case of Acute Leriche Syndrome mimicking Spinal Cord Infarction

Introduction:

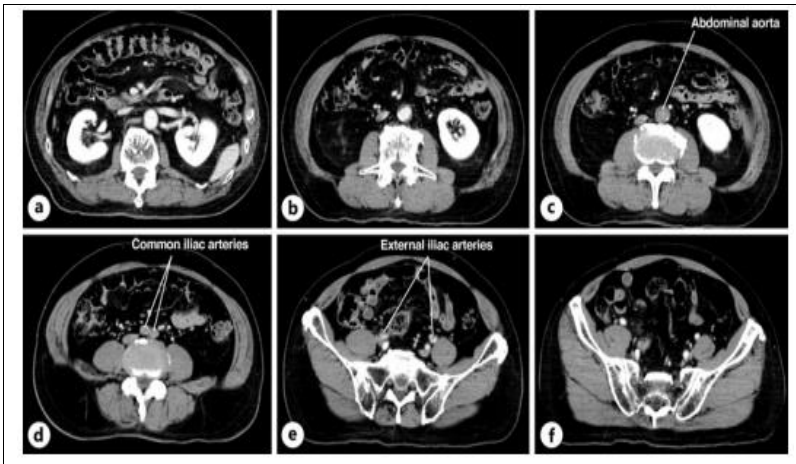
Leriche syndrome is an aortoiliac occlusive disease characterized by thrombotic obliteration of the terminal part of the abdominal aorta. Symptoms may include intermittent claudication, diminished femoral pulse, lower-extremity pallor, and/or impotence, similar to PAD.[1] In most cases, arterial stenosis advances gradually, and the symptoms of Leriche syndrome include long-lasting ischemia. But there have been reports of its acute form, which was known to be associated with a high mortality rate. Thus, it was crucial to get an accurate diagnosis and to start a therapeutic intervention as soon as possible.[2] This case described the patient with the acute form of Leriche syndrome.

When a patient has acute paraparesis, leriche syndrome should be taken into consideration as a possible differential diagnosis.

Case Presentation:

A 83-year-old man admitted to the emergency room after experiencing abrupt paraparesis while walking outside. He denied any earlier intermittent claudication. He had a history of hyperlipidemia, which was managed with statins. His blood pressure was 194/77 mm Hg and heart rate was 60/min in sinus rhythm. Neurological examinations revealed weakness in both lower extremities and paresthesia below the proximal section of the thigh on both sides. However, no sensory level was determined. The lower extremities exhibited widespread weakness, primarily on the left. The left thigh was atrophic relative to the right. Patellar and Achilles tendon reflexes were missing bilaterally. Babinski's sign was negative bilaterally, and no bladder-bowel disruption (BBD) was seen. During admission, blood testing showed increased D-dimer levels (2.9 μg/mL, normal range: 0-0.9 μg/mL), but other laboratory findings were normal, including creatine kinase. The clinical course of acute paraparesis led to the diagnosis of spinal cord infarction. However, thoracolumbar MRI did not reveal any aberrant abnormalities. Aortic dissection was ruled out with contrast-enhanced computed tomography, which showed no filling between the abdominal aorta distal to the renal artery branching and the proximal parts of the bilateral external iliac arteries (Figure 1). Contrast filling in both internal iliac arteries were retained. The ankle-brachial indices were reduced (left, 0.32; right, 0.26; cutoff: 0.9).

Detailed re-examination revealed the absence of pulses in both the dorsal pedis and femoral arteries. These observations led to a diagnosis of Leriche syndrome.



Figures 1 a–f. Contrast-enhanced computed tomography (CECT) findings revealing a lack of perfusion from the renal artery bifurcation to the proximal parts of both external iliac arteries.

The patient was started with intravenous heparin, oral cilostazol, and limaprost alfadex. On the day of admission, blood tests showed high creatine kinase levels (2,845 U/L; normal range: 59-248 U/L). However, with appropriate extracellular fluid infusion, levels returned to normal. On day 10 after admission, nerve conduction investigations revealed a significant decrease in the amplitude of compound muscular action potentials in the tibial nerve and sensory action potentials in both sural nerves. Somatosensory evoked potentials with left tibial nerve stimulation only elicited the P38 potential, which was derived from the primary somatosensory cortex and has a longer latency. Tibial nerve somatosensory evoked potentials were measured using standard laboratory protocols, and results were compared to published normal ranges. A follow-up thoracolumbar MRI revealed no abnormalities in the spinal cord. On day 16 after admission, a 3D computed tomography angiography from the abdominal aorta to the femoral artery indicated significant stenosis of the abdominal aorta distal to the renal artery bifurcation (Figure 2). Pain in both lower extremities progressively developed during nighttime rest. This is an indication of ischemia, and on day 28 of admission, he had an aorto-bilateral external iliac artery bypass. Following surgery, the patient was moved to a rehabilitation hospital. Six months later, his ankle-brachial index values improved to 1.12 and 1.03 on the right and left

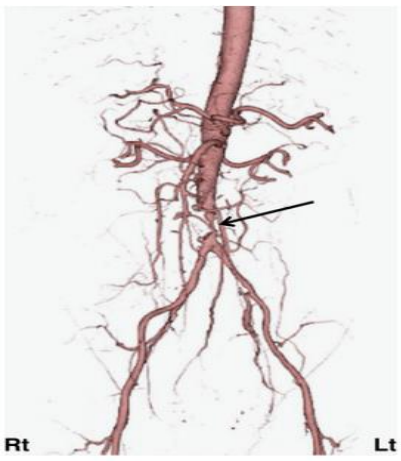


Figure 2. 3D computed tomography (CT) angiogram results showing a severe stenosis of the abdominal aorta distal to the renal artery bifurcation (black arrow).

sides, respectively.

Discussion:

Patients with Leriche syndrome frequently experience symptoms of chronic atherosclerotic occlusion, including as discomfort, pallor, coldness in the lower extremities, impotence in males, and intermittent claudication. In the present case, Leriche syndrome was managed with intravenous heparin and oral cilostazol and limaprost alfadex.[2] A previous study concluded that endovascular therapy for Leriche syndrome has a high technical success rate, a good short- and mid-term primary and secondary patency rates and could be a viable alternative to surgery for high-risk patients.[3]

Conclusion:

Leriche syndrome should be evaluated as a possible differential diagnosis in patients with acute paraparesis. Acute Leriche syndrome with inconspicuous indications of atherosclerotic occlusion can be identified by excessive muscle loss in the lower limbs compared to the clinical history.

References:

1. Lee BC, Oh DS, Lee HS et al. Leriche Syndrome Misdiagnosed as Complex Regional Pain Syndrome in a Patient with Neuropathic Pain Caused by a Chip Fracture: A Case Report. Medicina (Kaunas). 2021 May 12;57(5):486.
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