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Pulmonary Arterial Thrombosed Aneurysm Associated with Intracardiac Thrombus and Pulmonary Embolism in a Patient with Neuro-Behçet's Disease

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Abstract

Background: Neurological, cardiac, and vascular involvement in Behçet disease is very rare with higher mortality. The coexistence of manifestations in the same patient is exceptional. This makes management challenging because of the very high risk of bleeding. **Case Summary:** We report the case of a 25-year-old man who was admitted with an acute motor deficit in all four limbs. A thoracic angioscan showed a thrombosed aneurysm of the inferior lobar pulmonary arteries bilaterally with an obstructive intraluminal thrombus of a segmental branch of the right higher lobe. Transthoracic echocardiography (TTE) revealed a mobile right atrial thrombus measuring 13 × 10 mm. The patient was treated with methylprednisolone (1 g), cyclophosphamide, colchicine, and anticoagulation (heparin sodium at curative dose, relayed by antivitamin K). **Conclusion:** The outcome was satisfactory with complete resolution of the intraventricular thrombus and the aneurysm, and mild neurological sequelae.

Subject Areas

Nephrology, Neurology

Keywords

Neuro-Behçet's Disease, Intracardiac Thrombus, Aneurysm, Pulmonary Embolism

1. Introduction

Behçet disease (BD) is a systemic vasculitis with unknown etiology, characterized by relapsing episodes of oral and genital aphthous ulcers often associated with uveitis, skin lesions and frequent joint involvement. The central nervous system, gastrointestinal tract, and vessels are less frequently affected, but their involvement may result in life-threatening complications. This vasculitis can affect vessels of all sizes (small, medium and large caliber arteries, venules, veins) in multiple organs. Behçet's disease is generally not a chronic persistent inflammatory disease, but rather a disease characterized by recurrent acute inflammatory flare-ups [1].

Central nervous system (CNS) involvement in BD is commonly referred to as Neuro-Behçet (NB) and is classified as a parenchymal, non-parenchymal or mixed syndrome [2] [3]. The parenchymal type has a worse prognosis. It is the more prevalent subtype and presents as brainstem, hemispheric, spinal, and meningoencephalitis manifestations. Non-parenchymal type includes cerebral venous sinus thrombosis (CVST) and arterial involvement [4].

The prevalence of NB is variable between 5% - 10% of patients with BD. It is more common in males with the age of onset of symptoms between 15 and 45 years [5].

The association of neurologic, pulmonary, and cardiovascular manifestations is very rare, and presents challenges with respect to disease management [6].

We report the case of a 25-year-old patient hospitalized for Neuro-Behçet complicated by pulmonary and cardiovascular involvement.

2. Case Presentation

2.1. Chief Complaints

A 25-year-old man presented to the Emergency Department complaining of acute motor deficit of all four limbs.

2.2. History of Present Illness

The patient presented with weakness on all four limbs and an inability to deambulate. Symptoms started one year before hospitalization with mild headaches without photophobia or vomiting. Symptoms progressed rapidly with the onset of motor deficits on the right half of the body and then the involvement of the left half of the body with difficulties with speech. The patient denied fever or other constitutional symptoms.

2.3. History of Past Illness

The patient had recurrent mouth and genital ulcers going back five years before hospitalization and a history of head trauma two years before hospitalization. He was followed up for posttraumatic epilepsy and was placed on sodium valproate at a dose of 1000 mg/day.

2.4. Physical Examination

The patient's temperature was 38.5˚C, the peripheral pulses were present and symmetrical, heart rate was 95 bpm, respiratory rate was 18 cycles per minute, blood pressure was 120/80 mmHg and oxygen saturation in room air was 99%. The neurological examination revealed a tetrapyramidal syndrome (upper motor neuron signs in all four limbs with spastic dysarthria) with cerebellar involvement (statokinetic cerebellar syndrome), a Glasgow coma scale of 15/15, without any other pathological signs. Dermatological examination revealed three oral and one genital ulceration (Figure 1). Cardiovascular and pulmonary examinations were unremarkable. Electrocardiography was unremarkable. The ophthalmologic examination did not reveal any signs of inflammation in the anterior chamber or the vitreous humor.

2.5. Laboratory Studies

The laboratory findings were as follows (Table 1): The cytogenetics study of HLA B51 was positive. Proteins C and S, and antithrombin III assays were normal. Antiphospholipid antibodies were negative.

2.6. Imaging Examination

Brain magnetic resonance imaging (MRI) revealed a large left thalamic lesion which was hyperintense on T2 and fluid-attenuated inversion recovery (FLAIR)-weighted images (Figure 2 and Figure 3).

Table 1. Laboratory findings.

Result	Normal values
Complete blood count	
• White blood cells (WBC): 24,940/µL	• 4 - 10 × 10^3/µL
• Neutrophiles: 23,580/µL	• 2 - 7.5 × 10^3/µL
• Hemoglobin (Hb): 9.5 g/dL	• 13 - 17 g/dL
• Platelets: 131,000/µL	• 150 - 450 × 10^3/µL
C-reactive protein (CRP): 143.32 mg/L	• 0 - 5 mg/L
D-dimer: 12.5 µg/ml	• 0 - 5 µg/ml
Serologies (HIV, Syphilis, Hepatitis B and C): negative	• Negative
CSF study	
• Macroscopy: Clear, lucid	• Clear, lucid
• Protein: 0.29 g/l	• 0.15 - 0.45 g/l
• Glucose: 0.44 g/l	• 0.50 - 0.70 g/l
• Lymphocytes: 9/mm^3	• <3/mm^3
• Red blood cells: 260/mm^3	• 0/mm^3
• Direct exams: absence of germs	• Absence of germs
• Culture: negative	• Negative

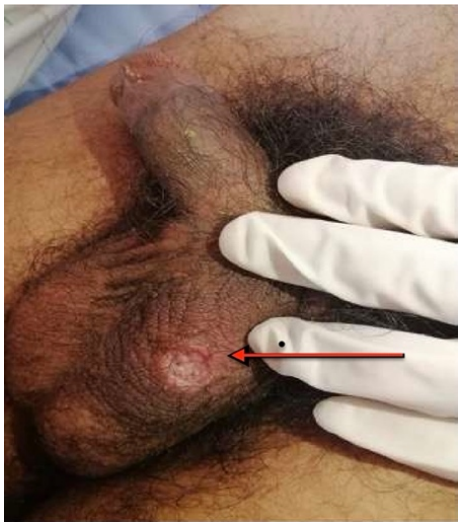

Figure 1. Genital aphthous ulcer.

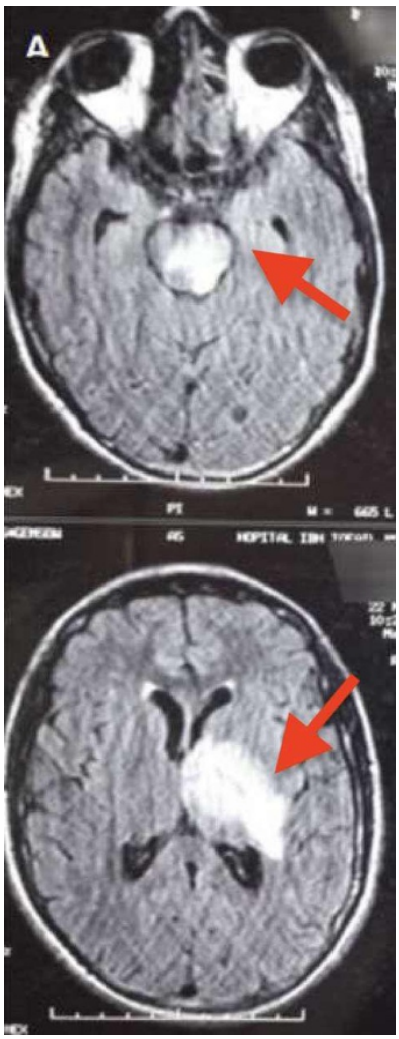

Figure 2. Brain MRI showing axial images demonstrating a bilateral pontine and left capsulo-thalamus lesion, hyperintense on FLAIR-weighted sequence, and little mass effect on the third ventricle.

2.7. Evolution during Hospitalization

On the fifth day of hospitalization, the patient developed a non-productive cough with polypnea. On physical examination, he was apyrexial and his respiratory rate was 50 cycles/min. A thoracic angioscan revealed a thrombosed aneurysm of the inferior lobar artery bilaterally with an obstructive intraluminal thrombus of a segmental branch of the right superior lobe (Figure 4). Transthoracic echocardiography (TTE) revealed a mobile right atrial thrombus measuring 13 × 10 mm (Figure 5).

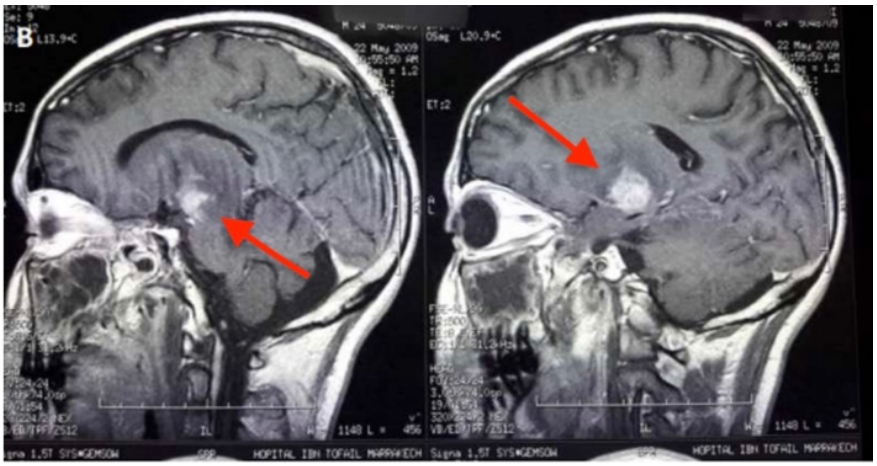

Figure 3. Brain MRI showing sagittal T1-weighted images with contrast enhancement of a mesencephalo-diencephalic lesion with a crown of edema and little mass effect.

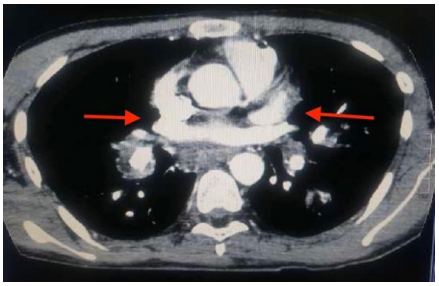

Figure 4. Chest CT with contrast revealing thrombosed aneurysm of the inferior lobar artery bilaterally with an obstructive intraluminal thrombus of a segmental branch of the right superior lobe.

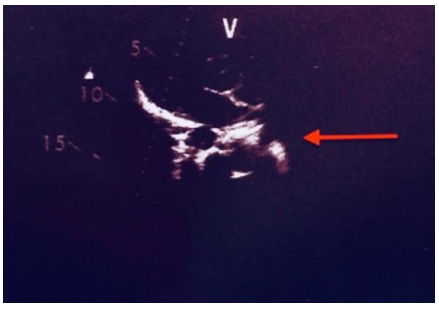

Figure 5. Transthoracic echocardiography (TTE) revealed a mobile right atrial thrombus measuring 13 × 10 mm.

3. Final Diagnosis

The diagnosis of Neuro-Behçet with cardiac and pulmonary thromboembolism was retained, according to the 2014 International Study Group Criteria for Behçet disease [7].

4. Treatment

The medical treatment combined methylprednisolone (1 g/day) for 3 days, followed by oral prednisone 50 mg/day (1 mg/Kg/day), intravenous cyclophosphamide at a dose of 750 mg (15 mg/kg) every 4 weeks for a total of 6 cycles, followed by oral azathioprine, colchicine, and anticoagulation (heparin at curative doses relayed by antivitamin K).

5. Outcome and Follow-Up

The evolution of neurological symptoms under treatment was satisfactory with some resolution of motor deficits and persistence of spasticity and mild cerebellar symptoms. Cardiovascular and pulmonary involvement also progressed satisfactorily under anticoagulant therapy.

6. Discussion

Neurological, cardiac, and vascular involvement in Behçet disease is very rare. The coexistence of manifestations in the same patient is exceptional. This makes management challenging, because of the very high risk of bleeding. The frequency of vascular involvement in Behçet disease is estimated to be between 2% - 46% in endemic regions. It is more common in men, and arterial lesions are less common than venous disease and its prevalence is about 1.5% - 3% worldwide [8].

This paper illustrates a case of Neuro-Behçet with systemic vascular involvement including arterial involvement in the form of a thrombosed aneurysm of the inferior lobar arteries, and cardiac involvement in the form of intracardiac thrombosis.

The mechanisms of thrombus formation are multiple: ischemia or rupture of endothelial cells, antiphospholipid antibodies found in 18% of cases or the presence of other prothrombotic plasma factors such as deficiency in protein C and or S [9], the increase in factor VIII, Leyden factor V homozygosity or prothrombin gene mutation [10].

After the first case by Budge *et al.* in 1977, around ten cases of intracardiac thrombosis with or without endomyocardial fibrosis were reported. Recently, 19.2% of cases of intracardiac thrombosis were reported in a study including 52 patients with cardiac involvement of Behçet's disease [11]. Several factors have been implicated in the genesis of cardiac or vascular thrombosis, and include plasma prothrombotic factors, the presence of antibodies against enolase, and hyperhomocysteinemia [12].

According to the available data, 7% to 29% of patients with Behçet have vascular lesions [13]. During Behçet's disease, aneurysms of the pulmonary arteries are considered exceptional, with a prevalence of 1.5% - 3% worldwide [8]. These aneurysms have been the subject of a few publications.

Clinically, these aneurysms are manifested by recurrent hemoptysis of low abundance, but in our case, it was a non-productive cough.

Arterial involvement occurs in 1% to 7% of patients with Behçet's disease but may be at the forefront of the clinical picture causing life-threatening complications. The most commonly affected artery is the aorta, followed by the pulmonary artery, femoral artery, subclavian artery, popliteal artery, and common carotid artery [14].

Pulmonary artery aneurysms are rare, but most often represent the second aneurysmal location after the abdominal aorta. These aneurysmal lesions are usually multiple, bilateral and of proximal location involving the trunks and the lobar or segmental bronchi of the pulmonary arteries and involve a risk of hemoptysis and death due to arterial rupture [15].

Even rarer is the association of pulmonary arterial aneurysms with cardiac thrombosis. Consequently, the high risk of bleeding inherent in the aneurysm is potentiated by the administration of anticoagulants in the event of associated intracardiac thrombus, as is the case in our patient [16]. Several authors have reported the resolution of intracardiac thrombi after medical treatment combining: corticosteroids alone or associated with colchicine and/or immunosuppressants (azathioprine, cyclophosphamide, cyclosporine) and treatment with antivitamin K or aspirin [17] [18]. These data show the major role that vascular inflammation plays in the formation of the thrombus. With regard to vascular involvement, the surgical treatment of an aneurysm with all its risks in patients with Behçet's disease frequently results in the recurrence of aneurysm.

Surgical treatment usually involves reconstruction using vascular grafts [19]. But it is often difficult and some specialists prefer to achieve only closure of the communication of the aneurysm. Neo-aneurysms have been observed at the vascular puncture sites and therefore exploration by arteriography should be avoided. Given the absence of a well-coded therapeutic approach concerning anticoagulation in the presence of such a very lethal pathological association due to its hemorrhagic and/or thrombotic risk, we opted for an initial treatment with heparin for better management of hemorrhagic accidents. The outcome of this treatment was favorable for our patient.

7. Conclusion

Neurological, cardiac, and vascular involvement in Behçet disease is very rare with higher mortality. The prognosis is unpredictable due to the occurrence of overwhelming hemoptysis. In our patient, pulmonary embolism and the right mobile atrial thrombus did not cause right heart failure and regressed totally under medical treatment.

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Ethics Approval and Consent to Participate

The study was reviewed and approved on May 1, 2020 by the Ethics Committee of the Faculty of Medicine and Pharmacy of Marrakesh in accordance with the Declaration of Helsinki.

As approved by the ethics committee, the patient included in the study gave his verbal consent before inclusion in the study. Reference number not applicable.

Authors' Contributions

All authors took part in the conceptualization of the Clinical presentation. Reine BIKOUTA and, Nissrine LOUHAB obtained and analyzed patient data and did the literature review; Reine BIKOUTA wrote the first draft. All authors read and approved the final manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] Gorial, F.I. and Jabbar, M.A. (2020) Impact of Disease Activity on Health-Related Quality of Life in Patients with Behçet's Disease: A Cross-Sectional Study. *Annals of Medicine and Surgery*, **54**, 43-46. https://doi.org/10.1016/j.amsu.2020.03.010

[2] Toledo-Samaniego, N., Galeano-Valle, F., Ascanio-Palomares, P., González-Martínez, B., Valencia-Kruszyna, A. and Demelo-Rodríguez, P. (2020) Manifestaciones neurológicas en la enfermedad de Behçet: Estudio de 57 pacientes. *Medicina Clínica*, **154**, 488-492. http://www.sciencedirect.com/science/article/pii/S0025775319307134

[3] Al-Araji, A. and Kidd, D.P. (2009) Neuro-Behçet's Disease: Epidemiology, Clinical Characteristics, and Management. *The Lancet Neurology*, **8**, 192-204. https://doi.org/10.1016/S1474-4422(09)70015-8

[4] Borhani-Haghighi, A., Kardeh, B., Banerjee, S., Yadollahikhales, G., Safari, A., Sahraian, M.A., *et al.* (2020) Neuro-Behcet's Disease: An Update on Diagnosis, Differential Diagnoses, and Treatment. *Multiple Sclerosis and Related Disorders*, **39**, Article ID: 101906. https://doi.org/10.1016/j.msard.2019.101906

[5] Toledo-Samaniego, N., Galeano-Valle, F., Ascanio-Palomares, P., González-Martínez, B., Valencia-Kruszyna, A. and Demelo-Rodríguez, P. (2020) Neurological Manifestations of Behçet's Disease: Study of 57 Patients. *Medicina Clínica* (*English Edition*), **154**, 488-492. https://doi.org/10.1016/j.medcle.2019.11.009

[6] Demirelli, S., Degirmenci, H., Inci, S. and Arisoy, A. (2015) Cardiac Manifestations in Behcet's Disease. *Intractable & Rare Diseases Research*, **4**, 70-75. https://doi.org/10.5582/irdr.2015.01007

[7] International Team for the Revision of the International Criteria for Behçet's Dis-

ease (ITR-ICBD) (2014) The International Criteria for Behçet's Disease (ICBD): A Collaborative Study of 27 Countries on the Sensitivity and Specificity of the New Criteria. *Journal of the European Academy of Dermatology and Venereology*, **28**, 338-347. https://doi.org/10.1111/jdv.12107

[8] Kwon, T.-W., Park, S.-J., Kim, H.-K., Yoon, H.-K., Kim, G.-E. and Yu, B. (2008) Surgical Treatment Result of Abdominal Aortic Aneurysm in Behçet's Disease. *European Journal of Vascular and Endovascular Surgery*, **35**, 173-180. https://reader.elsevier.com/reader/sd/pii/S1078588407005564?token=B80412C9129711F5BDC5E9B00D1F5135F882B783C282D23A07E0488AC251DAEDC357A6A88E77B3B080DCEA49B53D6E27

[9] Emmi, G., Silvestri, E., Squatrito, D., Amedei, A., Niccolai, E., D'Elios, M.M., *et al.* (2015) Thrombosis in Vasculitis: From Pathogenesis to Treatment. *Thrombosis Journal*, **13**, Article No. 15. https://doi.org/10.1186/s12959-015-0047-z

[10] Silingardi, M., Salvarani, C., Boiardi, L., Accardo, P., Iorio, A., Olivieri, I., *et al.* (2004) Factor V Leiden and Prothrombin Gene G20210A Mutations in Italian Patients with Behçet's Disease and Deep Vein Thrombosis. *Arthritis & Rheumatology*, **51**, 177-183. https://doi.org/10.1002/art.20237

[11] Eren, H., Öcal, L., Kalçik, M., Efe, S.Ç., Evlice, M. and Akçakoyun, M. (2016) Intracardiac Thrombus in Behçet's Disease. *Journal of Cardiovascular Echography*, **26**, 22-24. https://doi.org/10.4103/2211-4122.178472

[12] Ricart, J., Vayá, A., Todolí, J., Calvo, J., Villa, P., Estellés, A., *et al.* (2006) Thrombophilic Risk Factors and Homocysteine Levels in Behçt's Disease in Eastern Spain and Their Association with Thrombotic Events. *Thrombosis and Haemostasis*, **95**, 618-624. https://doi.org/10.1160/TH05-10-0659

[13] Alpagut, U., Ugurlucan, M. and Dayıoglu, E. (2007) Major Arterial Involvement and Review of Behcet's Disease. *Annals of Vascular Surgery*, **21**, 232-239. https://doi.org/10.1016/j.avsg.2006.12.004

[14] Kim, H.-K., Choi, H.H. and Huh, S. (2010) Ruptured Iliac Artery Stump Aneurysm Combined with Aortic Pseudoaneurysm in a Patient with Behçet's Disease. *Annals of Vascular Surgery*, **24**, 255.e5-255.e8. https://doi.org/10.1016/j.avsg.2009.07.012

[15] Park, H.S., Chamarthy, M.R., Lamus, D., Saboo, S.S., Sutphin, P.D. and Kalva, S.P. (2018) Pulmonary Artery Aneurysms: Diagnosis & Endovascular Therapy. *Cardiovascular Diagnosis and Therapy*, **8**, 350-361. https://doi.org/10.21037/cdt.2018.04.01

[16] Farouk, H., Elsaid, E. and El-Chilali, K. (2016) Diagnosis of Behçet's Disease in Patients with Intracardiac thrombi: A Real Big Challenge. *International Journal of Rare Diseases & Orphan Drugs*, **1**, Article 1001. https://www.jscimedcentral.com/RareDiseases/Articles/rarediseases-1-1001.pdf

[17] Aksu, T. and Tufekcioglu, O. (2015) Intracardiac Thrombus in Behçet's Disease: Four New Cases and a Comprehensive Literature Review. *Rheumatology International*, **35**, 1269-1279. https://doi.org/10.1007/s00296-014-3174-0

[18] Darie, C., *et al.* (2005) Pseudotumeur cardiaque révélant une maladie de Behçet. *La Revue de Médecine Interne*, **26**, 420-424. https://www.researchgate.net/publication/246642472_Pseudotumeur_cardiaque_revelant_une_maladie_de_Behcet

[19] Kechida, M., Salah, S., Kahloun, R., Klii, R., Hammami, S. and Khochtali, I. (2018) Cardiac and Vascular Complications of Behçet Disease in the Tunisian Context: Clinical Characteristics and Predictive Factors. *Advances in Rheumatology*, **58**, Article No. 32. https://doi.org/10.1186/s42358-018-0032-x

List of Abbreviations

BD: Behçet Disease
CNS: Central Nervous System
NB: Neuro-Behçet
CVST: Cerebral Venous Sinus Thrombosis
MRI: Brain magnetic Resonance Imaging
CT: Computerized Tomography
TTE: Transthoracic Echocardiography