



## Sneddon Syndrome with the Initial Presentation of Intracranial Hemorrhage: A Case Report

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### ABSTRACT

Sneddon syndrome (SS) is characterized by chronic, progressive arteriopathy, which causes ischemic stroke and skin lesions. It seems that thrombotic or embolic processes in the vessels may be involved in the pathology of this syndrome. Neurological symptoms always occur due to the ischemic events of the cerebrovascular system, and the associated cutaneous manifestations include deep blue skin lesions with irregular margins, known as livedo reticularis and livedo racemosa. Despite the ischemic events, hemorrhagic cerebral accidents are unusual in SS. Our case was apparently a normal woman with negative medical history who, despite the normal ischemic cerebral manifestations, initially presented with intracranial hemorrhage, which progressed to new skin lesions (livedo reticularis) after a few days. In the follow-up, the patient was diagnosed with SS.

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### Introduction

Sneddon syndrome (SS) is characterized by chronic, progressive arteriopathy, which causes ischemic stroke and skin lesions (1-4). Incidence of SS is reported to be four per a one-million population, and it is known to be more prevalent among young women (1). Although the pathophysiology of SS remains unknown (5), it seems that thrombotic or embolic processes in the vessels may be involved in the occurrence of this syndrome.

Antiphospholipid antibodies are variable in the patients with SS. While ischemic stroke is considered to be the most frequent cerebrovascular complication in SS, some studies have reported other neurological manifestations, such as headaches, seizures, cognitive and psychiatric disturbances, tremor, myelopathy, and encephalopathy (1,2,5,6).

In addition, the skin manifestations associated with SS include deep blue skin lesions with irregular margins, known as livedo reticularis (LR) and livedo racemosa. These skin lesions are caused by non-inflammatory vasculopathy and might be detected on the trunk and limbs (3,7,8). The other organs that may be affected by SS are the heart, kidneys, and eyes, giving rise to myocardial, renal, and retinal infarctions. Furthermore, involvement of the cardiovascular system in SS could lead to hypertension and cardiac valve disease (1,9-11).

In this article, we described the case of a 45-year-old woman who, despite the usual ischemic cerebral manifestations, initially presented with intracranial hemorrhage (ICH) and was diagnosed with SS in the follow-up.

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## Case report

A 45-year-old woman was admitted to the department of neurology for the first time due to headache and slurred speech a few hours prior to her admission. Moreover, the patient had complaints of blurred vision and right-sided weakness in her body. She had no history of recent head trauma or systemic febrile illness. The medical history of the patient revealed no hypertension, infertility, fetal loss, skin disorders or other diseases. Personal, drug use, and family history of the patient were negative as well.

In the physical examination of the patient upon admission, blood pressure was 155/85 mmHg, while the other vital signs (pulse rate, respiratory rate, and temperature) were normal. Although the patient had normal overall mental status, she had fluent speech and unilateral (right-sided) hemiparesis. In addition, the right-sided plantar reflex was upward. In the systemic examination, several scattered purple mottling skin rashes (LR) were observed, which were more obvious on the extremities (Figure 1). Otherwise, no significant abnormalities were detected in the general examination of the patient.



**Figure 1.** Dorsal and Palmar Surface of Hands with Purple Discoloration of Skin (Livedo Reticularis)

Laboratory findings of the patient are presented in Table 1.

**Table 1.** Laboratory Findings of Patient

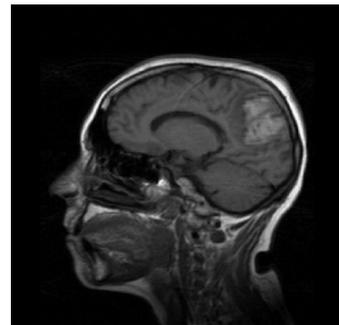
Plt	217000/dl
WBC	7000/mm
Hb	11.7 mg/dl
ESR	26 mm/hour
CRP	10 mg/l
ACLA	1.1 and 5.9 units (normal range: ≤11)
ANA	1 (normal range: ≤10)

Plt: platelet count; WBC: white blood cell count; Hb: hemoglobin; ESR: erythrocyte sedimentation rate; CRP: C-reactive protein; ACLA: anti-cardiolipin antibody; ANA: antinuclear antibody

According to our observations, C3, C4, cANCA, pANCA, protein C, protein S, antithrombin III, blood urea nitrogen, creatinine, and liver function test were in the normal range. Immunoglobulin electrophoresis showed a normal value as well. In the brain CT-scan and MRI, a massive intraparenchymal brain hemorrhage was detected in the left parietal lobe (Figures 2 & 3).

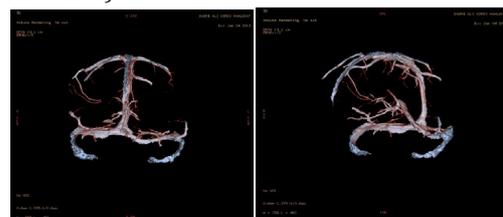


**Figure 2.** Non-Enhanced Brain CT-Scan Showing Intracranial Hemorrhage in Left Parietal Lobe

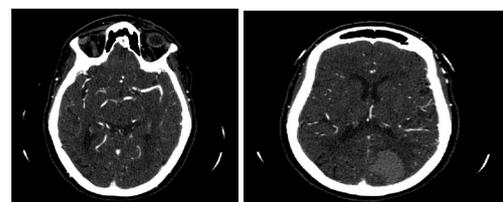


**Figure 3.** Sagittal View of Non-Contrasted Brain MRI Showing a Hemorrhagic Area in Parietal Lobe

For further evaluation, brain CT angiography (CTA) and venography (CTV) were performed. Accordingly, the anterior, middle, and posterior cerebral arteries, as well as the vertebra and basilar arteries, showed a normal course with no evidence of narrowing or aneurysmal dilatation. Moreover, no sign of filling defect was observed in the mentioned vessels, and there was no evidence of arteriovenous malformation in the imaging modalities. Brain CTV of the patient was normal as well (Figures 4 & 5).



**Figure 4 (a, b).** Normal Coronal and Oblique Views of Reconstructed Brain CTV



**Figure 5.** Axial Views of Non-Reconstructed Brain CTA Showing No Abnormalities in Arteries

To evaluate the possible cardiogenic cause of ICH, echocardiography was performed revealing no clue for the embolic source of hemorrhage. Surgical pathology report of the skin lesions was

consistent with the possibility of vasculopathic processes. Based on the observed signs and symptoms, the patient was diagnosed with SS and received conservative treatment. One month after discharge, significant improvement was reported in the patient.

After UAE, vaginal examination was performed by gynecologists to confirm control of bleeding. She was discharged 3 days after UAE procedure. At 6 months follow-up, she had regular menstruation without any symptoms of severe vaginal bleeding.

## Discussion

SS is a vasculopathy associated with skin lesions, which was first detected by a dermatologist who reported LR in a patient with multiple ischemic strokes (2). Despite the unknown etiology of SS, it has been established that the syndrome affects the small- and medium-sized arteries. SS is of three types; in the first type, there is no causative factors, while the second type is attributed to antiphospholipid antibodies, and the third type is the systemic lupus erythematosus, which is associated with the presence or absence of antiphospholipid antibodies (1,2,5,7,12).

Several studies have suggested that SS is inherited in an autosomal dominant pattern (13-15). The syndrome is a type of vasculitis presenting with skin lesions and neurological disorders. The lesions include deep blue skin discoloration with irregular margins (LR). Almost in all the cases, SS presents with the ischemic events of the cerebrovascular system, giving rise to headaches (85%), transient ischemic attacks, visual field defects, cognitive impairment and psychiatric problems, hemiplegia, hemianopia, dysarthria, central facial paralysis, seizures, myelopathy, and encephalopathy. Despite the ischemic events, hemorrhagic cerebral accidents are relatively unusual in SS (1,2,4,6,9,10).

SS could also involve the other systems and present with other symptoms than skin and neurological disorders. For instance, SS might affect the cardiovascular system and lead to valvular cardiac problems, especially mitral valve thickening and hypertension (1,10). Moreover, this syndrome may impair the renal function (1) or occlude the central retinal artery and central retinal vein, with subsequent retinal neovascularization (16,17).

Although SS often presents with ischemic cerebrovascular events, our case was a woman who developed hemorrhagic stroke. In addition, she had LR during hospitalization and at the time of ICH occurrence. Some reports confirm the simultaneous incidence of stroke and LR in the patients with SS (1).

As mentioned earlier, SS has various types with

or without antiphospholipid antibodies (1,2). Our case showed no associations with these antibodies as the results of investigating the antiphospholipid antibodies were negative twice. Furthermore, there was no evidence of cardiac or renal involvement in the physical and laboratory examinations of the patient. Also, biopsy of the skin lesions was non-specific histologically. In the literature, some reports are focused on the non-specific laboratory findings in SS, which is similar to the patient in the current study. On the other hand, SS diagnosis has mostly been based on the clinical symptoms and complementary paraclinical investigations to document the disease (18).

## Conclusion

In spite of most previous reports, which indicate ischemic stroke as an usual central nervous system manifestation, SS could be presented with hemorrhagic stroke even in the initial phase of presentation.

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## Conflict of Interest

The authors declare no conflict of interest.

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