MENINGOVASCULAR SYPHILIS

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October 10, 2025

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Primary Disciplinary Field(s): Neurology, Infectious Disease, Neurosyphilis

1. Core Definition

Meningovascular syphilis (MVS) is a distinct form of cerebral syphilis that arises when the infectious agent, the spirochete bacterium *Treponema pallidum*, attacks the blood vessels and the protective coverings of the brain and spinal cord, known as the **meninges**. This condition constitutes a major manifestation of neurosyphilis, which is the invasion of the central nervous system (CNS) by the syphilitic organism.

A crucial distinction of MVS, when compared to other severe forms such as meningo-encephalitic syphilis (or general paresis), is the primary target of the damage. In MVS, the damage is typically **diffuse**, affecting the cerebral vasculature and surrounding membranes through inflammatory processes (arteritis and meningitis), rather than directly destroying the neural tissue itself. In general paresis, the neural tissue undergoes extensive destruction. However, it is common in clinical practice for patients to present with a mixture of both meningovascular and parenchymal (neural tissue destroying) types of neurosyphilis.

2. Etiology and Epidemiology

Meningovascular syphilis typically arises during the later stages of secondary or early stages of tertiary syphilis, often occurring several years after the primary infection if treatment was inadequate or non-existent. The underlying mechanism involves chronic inflammation (endarteritis obliterans) of the smaller and medium-sized arteries supplying the brain and spinal cord, leading to restricted blood flow and ischemia.

While historically a significant cause of neurological and psychiatric illness, meningovascular syphilis is considered relatively rare in modern medical settings, especially where robust public health screening and early syphilis treatment are practiced. It constitutes a very small percentage--less than one per cent--of first admissions to psychiatric or mental hospitals, though its prevalence may be underestimated in populations with high rates of untreated syphilis or coinfection with HIV, which can accelerate the progression of neurosyphilis.

3. Major Clinical Forms

Meningovascular syphilis is clinically categorized into two major forms, based on the anatomical structures most severely compromised, although these conditions frequently coexist:

Syphilitic Meningitis: This involves inflammation of the brain coverings (meninges).

Vascular Neurosyphilis: This involves inflammation and damage to the cerebral blood vessels, leading to circulatory disruption.

Syphilitic meningitis itself can be further subdivided based on the location of inflammation and the resulting physiological impairment.

Acute Syphilitic Hydrocephalus: A rare form characterized by impairment in the absorption of the cerebrospinal fluid (CSF).
Basilar Meningitis: Inflammation concentrated at the base of the brain, often affecting the emergence of cranial nerves.
Vertical Meningitis: Inflammation of the meninges surrounding the upper convexities of the cerebral cortex.

4. Clinical Presentation of Syphilitic Meningitis

The symptoms of syphilitic meningitis are highly dependent on the location and extent of the inflammatory response. The hydrocephalic type, which is uncommon, presents classic signs of elevated intracranial pressure, including **severe headache**, nausea, vomiting, and rigidity of the neck.

In **basilar meningitis**, the predominant symptoms reflect the involvement of localized brain structures and cranial nerves. Patients typically experience persistent headache, a noticeable dulling of mentality, and specific impairment of **memory for recent events**. Other common neurological features include sleepiness, and in more severe or advanced presentations, confusion, delirium, and even stupor. Cranial nerve involvement is a hallmark of this type, potentially resulting in symptoms like double vision (diplopia), deafness, or facial numbness (anesthesia).

The **vertical type** involves more extensive cortical areas and consequently produces a broader range of neurocognitive symptoms. Patients often report severe, unremitting headaches, chronic dizziness, marked irritability, and a debilitating **loss of concentration**. Cognitive processing is noticeably retarded, affecting both the speed of thought and speech functions, and confusion or delirium may be present. Significantly, and unlike the widespread personality and judgment disturbances seen in general paresis, syphilitic meningitis typically does not lead to serious deterioration of personality structure, fixed delusions, or profound disturbances in social reactions.

5. Clinical Presentation of Vascular Neurosyphilis

Vascular neurosyphilis usually presents in conjunction with or shortly after the onset of syphilitic meningitis. The early phase is often marked by intermittent, subacute symptoms related to compromised cerebral circulation. These include recurring headaches, which are characteristically

worse at night, generalized dizziness, chronic insomnia, increased irritability, and emotional instability. As the disease progresses, patients frequently report increasing apathy and gradual impairment of memory functions.

The defining feature and most dangerous consequence of vascular neurosyphilis is the occurrence of **vascular (circulatory) accidents**, which manifest as strokes or transient ischemic attacks (TIAs). These events arise from the syphilitic arteritis narrowing or occluding blood vessels. Such accidents cause acute neurological deficits, such as **aphasia** (difficulty with language production or comprehension) and **hemiplegia** (paralysis affecting one side of the body). These repeated or severe circulatory disturbances result in measurable and potentially irreversible loss of intellectual capacity.

6. Diagnosis and Therapeutic Management

The accurate diagnosis of meningovascular syphilis requires demonstrating evidence of active syphilitic infection within the central nervous system, typically through specialized serological tests on both the serum and the cerebrospinal fluid (CSF), such as the VDRL-CSF test.

The established and most effective treatment protocol for all forms of meningovascular syphilis is systemic administration of **penicillin**. Penicillin is highly efficacious in eradicating the *Treponema pallidum* organism and arresting the inflammatory and destructive processes within the CNS. Excellent clinical results are generally achieved following treatment, leading to resolution of active inflammation and prevention of further damage.

However, the long-term prognosis is heavily influenced by the pre-treatment status of the patient. If significant or permanent structural damage to the neural tissue or severe vascular injury has already occurred--particularly if multiple strokes have taken place--these resulting neurological deficits (such as paralysis, intellectual loss, or aphasia) may not be reversible, even after the successful microbiological cure of the infection.

7. Further Reading

Neurosyphilis (Wikipedia)
Syphilis (Wikipedia)
Treponema pallidum (Wikipedia)