



Jean-Martin Charcot: Mapping Epilepsy and Functional Seizures at the Salpêtrière

(History of Neurology)

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Abstract

In the late nineteenth century, Jean-Martin Charcot played a pivotal role in distinguishing epilepsy from functional seizures at a time when both conditions were often conflated under the concept of hystero-epilepsy. Working at the Salpêtrière Hospital in Paris, Charcot developed a rigorous anatomo-clinical method grounded in systematic observation and detailed documentation, helping transform neurology into an empirically based discipline. Through clinical teaching, photographic documentation, and collaboration with colleagues such as Londe and Regnard, he produced some of the earliest visual and descriptive analyses of seizure semiology and functional neurological disorders. Charcot carefully differentiated seizure types, including petit mal and grand mal, and emphasized the clinical importance of brief absence episodes. His school further advanced the understanding of focal epilepsy, particularly through the work of Albert Pitres, who correlated focal motor seizures with cortical lesions identified at autopsy, anticipating modern concepts of epileptogenic localization. At the same time, Charcot investigated “hysteria”, describing the staged semiology of the “grand hysterical attack” and promoting systematic clinical observation rather than sensational interpretation. Contrary to later portrayals that characterized him as misogynistic or as having “invented” hysteria, historical analyses suggest that Charcot maintained a rigorous scientific approach and supported the careers of several women physicians. Toward the end of his career, he also proposed that psychological trauma could produce somatic symptoms beyond conscious control, anticipating later developments in dynamic psychology by Janet and Freud. Charcot’s work ultimately clarified the relationship between epilepsy and functional disorders while highlighting the complex interaction between neurological and psychological processes.

Keywords: Jean-Martin Charcot, Epilepsy, Functional Seizures, Hystero-epilepsy, Seizure Semiology, Salpêtrière Hospital



Introduction

In the late nineteenth century, the neurologist Jean-Martin Charcot (1825-1893) emerged as a central figure in delineating the boundaries between epilepsy and functional (dissociative) seizures (*Hingray et al. 2025*). Today, these conditions can usually be distinguished through careful semiological analysis and, when available, correlation with video-electroencephalographic recordings (*Revajová et al. 2026; Dudley et al. 2024*). In Charcot's era, however, such distinctions were far from straightforward. Clinical observations were complicated by a conceptual overlap between epilepsy and what was then termed hystero-epilepsy, a category that blurred neurological and psychological interpretations of paroxysmal phenomena (*Drouin et al. 2020*). Within this complex clinical and intellectual landscape, Charcot systematically documented seizure disorders, laying the groundwork for modern neurology and shaping the frameworks through which these conditions would subsequently be understood. His meticulous attention to clinical detail and insistence on rigorous observation helped transform neurology from a descriptive field into an empirically grounded discipline.

The Salpêtrière Hospital: Historical and Medical Context

The Salpêtrière Hospital was the stage upon which Charcot made his foundational contributions. It is also remembered for darker chapters of history: during the 1792 September Massacres, many women hospitalized there were killed. Even a century later, the condition of women within medical institutions remained problematic. Charcot worked within a cultural climate shaped by deeply ambiguous-and often misguided-ideas about female illness. These prevailing notions included the belief that women were inherently more susceptible to emotional and neurological disturbances, a bias that influenced diagnosis and treatment throughout Europe.

In the United States, seizure diaries from the late nineteenth century document patients-sometimes labeled hysterical-who in fact experienced frequent epileptic status (*Devinsky 2007*). In Europe, theories such as the "ovarian theory" of hysteria led to therapeutic practices that today seem astonishing: acute compression of the ovaries during a hysterical attack, or chronic compression devices intended to correct presumed organ dysfunction (*Jarrell and Stahnisch 2021*). Another American theory proposed venous hyperemia as the cause of attacks, leading physicians to compress the carotid arteries during seizures, a practice that reflected the era's blending of physiological experimentation with clinical intervention. While these procedures are now obsolete, they would later evolve into experimental explorations of vagal nerve function and, eventually, vagus nerve stimulation-a therapeutic modality still used in epilepsy management today (*Lanska 2002*).

Charcot's Method and School

Charcot introduced a rigorous anatomo-clinical method and trained an extraordinary generation of neurologists who would shape the future of the discipline. Paintings of his famous lectures depict a crowded amphitheater, with clinicians and artists documenting the proceedings.



Lacking video-EEG or motion pictures, Charcot relied on photography to capture the fleeting and complex manifestations of neurological disorders.

One of his principal collaborators was Albert Londe (1858-1917), a pioneering photographer who devised a multi-lens system capable of capturing sequential images—an early form of chronophotography. Through these sequences, he documented the phases of the "grand hysterical attack," including dramatic opisthotonos postures and bizarre contractures, providing an unprecedented visual record of functional disorders. Another major contributor was Paul Regnard (1850-1927), who, with Désiré-Magloire Bourneville (1840-1909), produced a photographic atlas of neurological patients (*Regnard and Bourneville 1880*). Regnard himself had artistic ambitions, exhibiting photographs derived from clinical subjects, blurring the boundary between science and art. These visual records were not merely illustrative; they became essential tools for teaching, research, and the development of semiology.

Charcot and Epilepsy

Jean-Martin Charcot, as a professor of neurology at the Salpêtrière Hospital, delivered a series of dialogue-style case presentations on general neurological disorders between 1887 and 1889, never previously translated into English. These cases provide a first-hand view of Charcot's teaching method and his perspectives on various neurological conditions. One patient, in particular, exhibited bizarre ambulatory spells, likely representing absence status, which Charcot recognized as epilepsy. This otherwise healthy young man, with no history of generalized epilepsy or hysteria, suddenly became unaware of his surroundings during these spells, wandered across Paris and its outskirts, and engaged in complex interactions with others. Charcot traced the patient's movements, analyzing differential diagnosis, treatment, and pathophysiology of these intermittent episodes (*Goetz 1987*).

On January 31, 1888, Charcot devoted a lecture to epilepsy, carefully distinguishing between petit mal and grand mal. He described individuals who suddenly became unconscious, dropped objects, and resumed conversation as if nothing had happened—a phenomenon resembling childhood absence epilepsy but observed in adults. He also noted a "vertiginous" phase, leaving open whether he observed generalized absences or focal impaired-awareness seizures. Charcot recognized that even brief absence seizures could significantly impair quality of life, demonstrating a modern sensitivity to functional impact beyond dramatic clinical presentation (*Charcot 1887*).

In the photographic collections of Regnard and Bourneville, many patients labeled with "partial epilepsy" showed clear motor or neurological deficits, often sequelae of cerebral palsy or stroke. Contrary to common belief, patients with epilepsy were more numerous at the Salpêtrière than those diagnosed with hystero-epilepsy. Some photographic sequences depict a tonic phase with a cry and progressive contracture, consistent with focal epilepsy, though definitive classification remains uncertain.

Albert Pitres (1848-1928), Charcot's pupil, applied the anatomo-clinical method to nearly fifty cases of focal motor seizures with cortical lesions confirmed at autopsy, revealing somatotopic organization and anticipating modern concepts of epileptogenic and symptomatogenic zones in presurgical evaluation. This meticulous correlation between clinical observation and



neuropathology helped establish principles that continue to underpin modern epilepsy surgery (Brigo 2025).

The "Myth" of Charcot's Misogyny

Charcot faced criticism from contemporary feminist groups, yet historian Christopher Goetz argues that claims of misogyny lack historical foundation. Women such as Blanche Edwards (1858-1941) and Dr. Augusta Klumpke (1859-1927) thrived under his mentorship, challenging the simplistic image of Charcot as hostile to women. More importantly, he did not view hysteria as exclusively female, recognizing male hysteria as underdiagnosed rather than rare (Goetz 1999).

Among Charcot's most famous patients was Louise Augustine Gleizes (born 1861, date of death unknown), known as Augustine. Historical analyses reject any suggestion of inappropriate conduct by Charcot, instead highlighting his scientific rigor in documenting functional disorders. Augustine's case became emblematic of Charcot's method: systematic observation, photographic documentation, and staged demonstrations for educational purposes, without sensationalism or moral judgment (Walusinski 2013).

Was the Hysteria of the Salpêtrière "Invented"?

Some claimed that Salpêtrière hysteria was an "invented disease," a narrative recounted by Pierre Marie (1853-1940) in 1925 (Marie 1925). Administrative changes separating psychiatric and epileptic/hysterical patients inadvertently exposed functional patients to dramatic epileptic seizures, raising the question of how observation and imitation may have shaped semiology. While some exaggeration or mimicry may have occurred, contemporary scholarship emphasizes that Charcot's patients were genuinely afflicted, and that his systematic classification and documentation reflected scientific precision rather than theatrical invention.

The Semiology of "Grande Hystérie"

Charcot's description of the "grand hysterical attack," as reported in Paul Richer's seminal work on hystero-epilepsy, unfolds in stages (Richer 1881):

- Prodromal Phase: Psychic disturbances, hallucinations, emotional lability, and hysterogenic zones. Patients often reported vague sensations or emotional premonitions preceding the attack.
- Epileptoid Phase: Tonic rigidity, staring gaze, carpopedal spasm, clonic movements; variable and exaggerated compared to stereotyped epileptic seizures.
- Contortion Phase ("Clownism"): Extreme postures including opisthotonos and arc de cercle, often photographed for didactic purposes.

- *Attitudes Passionnelles*: Expressive, theatrical, sometimes ecstatic postures; iconic examples include Augustine.

The sequence could last many minutes, occasionally including hallucinations or residual contractures. Early instruments, such as plethysmographs, attempted to quantify motor patterns, differentiating hystero-epilepsy attacks from tonic-clonic seizures (Table 1). Charcot's attention to these fine-grained motor patterns anticipated modern movement disorder analysis and neurophysiological assessment.

Feature	Hystero-epileptic Attacks	Epileptic Attacks
Aura	None	None
Cry	Repeated, prolonged screams at the beginning and during the clonic period; rarely absent	Inaudible, muffled cry only
General stiffness	Yes	Yes
Limb attitude	Variable	Constant
Cruciform (cross-like) position	Yes	No
Clonic movements	Very extended, highly variable; projecting the thorax, pelvis, torsions, etc.	Limited, momentary clonic shocks
Tympanism (distension of the abdomen)	Present	Absent
Attack termination	Ovarian compression stops the attack	No effect on attacks
Consciousness	Rapid recovery	Prolonged deep sleep, associated with stupor
Delirium	Present	Violent delirium
Cried during attack	Yes	No
Attack duration	Series lasting 4 to 5 hours	Isolated attacks
Other features	Delirium, singing	—

Table 1. Comparison of hystero-epilepsy attacks and epileptic seizures (from Richer P. 1881, modified).



Psychic Trauma and Dynamic Psychology

Toward the end of his career, Charcot proposed that psychic trauma-sometimes manifesting in dreams-could generate somatic symptoms, operating outside conscious control. This anticipation of dynamic psychology bridged his work to that of Pierre Janet (1859-1947) and Sigmund Freud (1856-1939). Charcot's recognition of the mind-body interface demonstrated remarkable prescience: he understood that neurological symptoms could be modulated by psychological states, and conversely, that psychological distress could manifest in physical pathology (Gelfand 2024).

Conclusions

In tracing Charcot's trajectory across epilepsy and hysteria, a coherent intellectual arc emerges. He clarified the distinction between epilepsy and hystero-epilepsy, advanced the idea that psychic trauma can manifest somatically, and laid the groundwork for modern dynamic psychology. Charcot's legacy endures not only in the anatomo-clinical method and semiology of seizures, but in the insight that neurological and psychological phenomena are deeply intertwined-a principle that continues to guide neurology and psychiatry today. His work reminds us that careful observation, rigorous documentation, and an integrative approach to mind and body remain as relevant now as they were in the halls of the Salpêtrière over a century ago.

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