

Babinski the great: Failure did not deter him

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Abstract

Joseph Babinski (1857-1932) was born on November 17, 1857. He worked in a clinical arena dominated by Charcot and a focus on hysteria. His primary aim was in trying to find the reliable clinical signs to distinguish organic from non-organic disease of the nervous system. He was considered as masterly diagnostician, relying considerably less on neuropathological reports. Babinski's first attention to the reflex of the toes occurred during a chance observation of the contrasting responses between two female patients, one a hysteric and the other a hemiplegic. He first published description of his famous "sign" in 1896. Babinski's love for research works could be gauged from his desire to publish and by the age of 27 years, he had to this credit, 12 important articles, mainly concerned with histological and neurological themes and one of his articles on the basic description of muscle spindles was considered to be a significant one. He was awarded the doctorate degree in 1885. Babinski introduced the concept of pithiatism, meaning "curable by suggestion." He anticipated the emergence of neurosurgery in France and only 6 days prior to his death he is on record to have said that his most vital contribution to the cause of neurosciences was not the sign he described, but that he could goad Clovis Vincent and Martel to take up neurosurgery as a specialty.

Key Words

Babinski, extensor plantar, hysteria

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Though innumerable clinical signs have been described over the last few centuries, none perhaps, is comparable with the one described by Joseph Juan Felix Francois Babinski. The demonstration of an up going great toe on scratching the lateral aspect of the sole is accepted universally as the incontrovertible evidence of a lesion in the corticospinal tract, from its origin in the motor area of the cerebral cortex, down to its termination in the anterior horn cells in the spinal cord and this singular observation has immortalized Babinski in the world of medicine and neurology [Figure 1].

Babinski, a French neurologist was actually of Polish origin. He was born in the same year with Sir Charles Scott Sherrington, the peerless neurophysiologist, who won the Nobel Prize in 1932.^[1,2] His father's name was Alexander Babinski and his parents were forced to leave their motherland and take refuge in France when a reign of terror was unleashed in Poland.^[2]

After early schooling in Batignolles, Babinski decided on a career in medicine and joined at the Faculty of Medicine as a medical student in 1875. He passed "Internat," the university examination held in 1879 and secured 4th position. Charcot appreciated Babinski's talents as an astute clinical observer and he was soon admitted to his affection, which Sigmund Freud described as the "preferred pupil of the Maitre."^[1] His love and dependence on his pupil is well-exemplified in the famous painting of André Brouillet while Charcot had been delivering a lecture .

Babinski studied pathology, physiology and internal medicine as a part of his internship training and later pursued neurology in clinical residency under the able guidance of Edne Felix Vulpian, a great contemporary of Jean Martin Charcot, who had an abiding interest in pathological changes in neurological diseases.^[1] Babinski's love for research works could be gauged from his desire to publish and by the age of 27 years, he had to this credit, 12 important articles, mainly concerned with histological and neurological themes and one of his articles on the basic description of muscle spindles was considered to be an important one. He was awarded the doctorate degree in 1885 for a thesis on multiple sclerosis, the title being "Etude Anatomique et Clinique sur la sclerose en plaques (Anatomical and Clinical study of Multiple Sclerosis)."^[1] Thereafter, he was appointed as "Chef de Clinique" to Charcot, a post comparable with that of the registrar in the present days, in spite of the fact that he never

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served in any capacity under him. However, for reasons that were curious, inexplicable and far removed from the academic, he failed to assume the position of the "Professor Agrégé," the title that Charcot held. The denial of that title to Babinski was only the reflection of the pettifogging internecine feud that was prevalent in Paris in those days and which did a lot of harm to the growth of neurosciences in France.^[2,3] He was thoroughly disappointed and decided not to appear for the examination again and preferred to quit once for all, his beloved Salpêtrière and to settle in La Pitte in 1890, a comparatively lesser known institute, where he was nominated the Chief in 1895 and stayed there until his retirement in 1922.^[2,4] Ad' Arsenal wrote to Charles-Édouard Brown-Sequard "...hence the reign of Charcot at the medical school is over"

Babinski's contribution to neurology had been phenomenal and highlights of some of them are as follows:^[5,6]

Introduced the following terms such as, asynergia, dysdiadochokinesia, pronator sign, pithiatism.

Babinski-Anton syndrome: Denial of blindness in occipital cortical lesion.

Babinski-Nageotte syndrome: Seen in unilateral bulbar lesions of medullo-bulbar transitional region.

Babinski-Fröhlich's syndrome: The other name for dystrophia adiposo genitalis.

Babinski-Froment syndrome: Vasomotor and trophic disorders diffuse amyotrophy and muscle contractions following traumatic tissue damage.

Babinski-Vaquez syndrome: Cardiac pathology in tabes dorsalis.

Babinski-Weil test for vertigo and Babinski's trunk raising test to distinguish organic paraparesis from hysterical paraparesis.

Babinski sign II: Galvanic test for unilateral hearing disturbance.

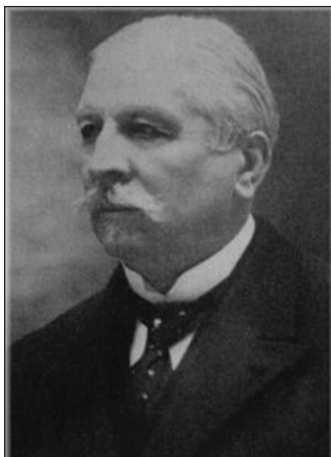


Figure 1: Joseph Babinski on his election to the *Société de Neurologie*

Babinski sign III: Diminished ankle jerk in sciatica is the magnum opus: "Phenomenon des Orteils".

Babinski in the late 1880s was instructed by Charcot, at a time when the Master of Clinical Neurology was virtually obsessed with hysteria [Figure 2], to test each and every dermatome in all patients for exteroceptive sensation. Babinski observed that in many cases where the spinal cord had been compromised, the great toe, on scratching the lateral aspect of the sole turned upward. This phenomenon struck him as curious and he called it "phenomenon desorteils," simply (phenomenon of the great toe). Reflex testing had been introduced into the neurological examination several decades earlier by two German neurologists, Carl Westphal (1833-1890) and Wilhelm Erb (1840-1921) who in 1875 described the sign in *Archiv für Psychiatrie* where Erb wrote the actual paper and Westphal wrote the editorial review.^[2] Richard Khalil in his book, *Vie et Oeuvre de Babinski*, published in 1979, wrote that Babinski was initially attracted to the reflex during a chance observation of the contrasting responses between two female patients, one a hysteric and the other a hemiplegic.^[1] He presented his observations before the "Société de Biologie" on the 22nd of February 1896. His publication ran only into 28 lines.

Babinski published his observations in "Semaine Medicale" in 1898 with accounts of cases of hemiplegia, Jacksonian epilepsy and strychnine poisoning and also explained in detail its significance. He concluded that the sign was to be explained by affection of the pyramidal tract and he also noticed that it was found in healthy infants as well. He further wrote that the sign did not appear in hysteria and thus elicitation of this sign could differentiate the two conditions.^[7] It is worth remembering that nevertheless in this first paper in 1896, he simply described extension of all toes with pricking of the sole of the foot. It was not until the second paper of 1898 that he specifically described the extension of the hallux with strong tactile stimulation of the lateral border of the sole.^[8-10]

Babinski introduced the concept of pithiatism, meaning "curable by suggestion".^[11] In 1893, he presented the case of



Figure 2: Charcot demonstrating hysteria before his pupils. Babinski is supporting the patient: Courtesy Jan Van Gijn. The Babinski Sign: A Centenary, Utrecht: Universiteit Utrecht, 1996

Gabrielle, a hysterical patient who was also hemiplegic on the right side. He demonstrated that in pure hysterical response, most of the time some muscular rigidity was noticed and the reflexes were identical, while on the hemiplegic side, the reflexes were exaggerated.^[1] Babinski advanced some acceptable criteria for differentiating hysteria from organic illnesses. Charcot felt that he discovered a new entity "hystero-epilepsy," a disorder of the mind and brain, which combine features of hysteria and epilepsy.^[12] Babinski believed that hysterical patients displayed symptoms of epilepsy as they were vulnerable to suggestions and could imitate the attacks of epilepsy since they repeatedly witnessed such organic attacks in the wards. Hence he could ultimately persuade Charcot to realize that these emotionally troubled, young and labile women were highly sensitive to suggestions. The master and the pupil thereafter, devised a two-stage treatment schedule of isolation and counter-suggestion that turned out to be highly effective.^[12]

Babinski was a tall, handsome, quiet and unassuming man. His examination was painstaking and pertinacious, which often lasted for several hours. He carefully observed the spontaneous abnormalities in a patient's behavior and then systematically proceeded to evaluate the reflexes and reactions with infinite care. André Breton, one of the initiators of the surrealist movement, was initially a pupil of Babinski at the La Pitié, wrote, "He pursued the inspection of his patients relentlessly to the point that it was more than a mere physical exam. Here and there he would make a comment and without putting down his neurologist's hammer and pin, he engaged in his examination..."^[13] In 1912, he published four lectures in the Bulletin Médical with the title "Tendinous and cutaneous reflexes," in which he stated that he considered a reflex to be a means of interrogating the central nervous system: "The hand carrying the neurologist's hammer interrogates the nervous system, which replies to the questions asked with clarity through the reflexes. The precious revelations obtained reveal the damage to the fabric of the nervous system sometimes with a draftsman's precision. The reflexes disclose the seat and extent of the grave dangers threatening the nervous system." Philippon and Poirier wrote an excellent biography on him under the title of Joseph Babinski: A Biography^[14] and Sir Francis M. R. Walshe, one of the most intellectually gifted neurologist and known for his barbed and acerbic comments, wrote "His sign, the extensor plantar, has continued to fascinate me each time I evoke it. Hence simple it tells so much, seeming to bear fate like the thumb of the Roman citizen at a gladiatorial contest. Some rash essayists have endeavored to minimize its value, gravely misquoting its discoverer in his misguided labor. Yet neurologists will continue to use it and it is the essays, not the sign, that will be forgotten."^[2]

Babinski was fond of classical music, opera, ballet and was a great admirer of the skilled movements of the dancers.^[1] Apart from being a supreme clinician he was a discerning histologist and recognized muscle spindles and distinguished between neuropathic and myopathic changes in the muscles. He recognized the features of muscular dystrophy and drew attention to the hemiplegic variety of multiple sclerosis by identifying the plaques.^[6] He successfully localized a tumor in the spinal cord clinically, which turned out

to be neurofibroma.^[2,6] He anticipated the emergence of neurosurgery in France and only 6 days prior to his death he is on record to have said that his most vital contribution to the cause of neurosciences was not the sign he described, but that he could goad Clovis Vincent and Martel to take up neurosurgery as a specialty.^[6] At La Pitte, he organized the "Societe de Neurologie de Paris" along with Joseph-Jules Dejerine, Pierre-Marie, Édouard Brissaud and he became the Editor of Review Neurologie in 1907.^[6] He was elected to Academy of Medicine, American Neurological Association, Royal Medical Society of London, Wilnow University and Warsaw Neurological Sciences, among others.^[11] Egaz Moniz from Portugal, who received the Nobel Prize in 1949, was attracted toward him and Babinski wrote the preface for his monograph published in 1931.^[1,6] In his last years, he developed Parkinsonism and died of pneumonia in 1932.^[1,6] His friends and admirers buried him at the Polish Cemetery in Montgomery. Babinski's obituary in the Lancet ended with the following words: "None of Charcot's pupils is surer to be remembered for his achievements in the field of neurology."^[2] Although Babinski is considered to be iconic, the extensor plantar sign described by him will remain immortal.

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