

The Babiński sign: from “toes phenomenon” to “great toe phenomenon”

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Abstract. The Babiński sign is one of the most important signs in clinical neurology. It refers to the extension (dorsiflexion) of the great toe following stimulation of the sole. However, in the first description of this sign, Joseph Francois Félix Babiński (1857-1932) did not mention the movement of the great toe, but of all toes. The terms used by Babiński in his first description of the sign is “orteils” (toes, in the plural), and not “grand orteil” (great toe). This article traces back the initial descriptions of the Babiński sign made by the great French neurologist of Polish descent and other influential neurologists of the 19th Century. Contrary to what is commonly believed, the Babiński sign was not described in its complete form from the very beginning: it took some time for its discoverer to fully realize that what characterized the sign was the extension of the great toe alone, and not of all toes.

Key words: Babiński sign, Extensor cutaneous plantar reflex, History of Neurology, Joseph Francois Félix Babiński

The extensor cutaneous plantar reflex is one of the most important signs in clinical neurology. It is also known as Babiński sign (BS), from the name of Joseph Francois Félix Babiński (1857-1932), a French neurologist of Polish descent who was a pupil of Jean-Martin Charcot (1825-1893) at La Salpêtrière, Paris (1). Babiński described this sign in a very short article published on February 22, 1896 (2). This article had no references, was written with brevity and clarity, without mentioning the number of patients in whom the BS had been studied, and not reporting the part of the sole that was stimulated.

This BS can be elicited in patients with damage to the central nervous system motor pathways (3,4). The BS refers to the extension (dorsiflexion) of the great toe following stimulation of the sole. However, the first description of this sign does not mention the movement of the great toe, but of all toes. The terms used by Babiński in his first description of the sign is “orteils” (toes, in the plural), and not “grand orteil” (great toe)

(1). It was only in 1898 that Babiński recognized that the extension is predominating in the great toe or the first two toes (2). The movement is more evident in the great toe due to the structure of the metacarpophalangeal joint and the limited extension of the little toes. The movement arises from the contraction of the extensor hallucis longus muscle, which has its insertion at the terminal phalanx of the great toe.

In an article published in 1903 in the *Revue Neurologique*, the neurologist André Léri (1875-1930) – who had studied under Babinski – still wrote about toes extension (in the plural), although in a note he mentioned the existence of a reflex of the great toe in abduction (3). Interestingly, in the same issue, the Romanian Neurologist Gheorghe Marinesco (1863-1938) wrote that “the toes phenomenon [phénomène des orteils] consists, according to Babinski, in a movement of extension which is more evident at the level of the great toe, whereas the other toes extend a little, remain immobile, or even flex” (4).



Figure 1. Drawing illustrating the Babinski sign with extension of the great toe alone. From: Babinski J, Froment J. *Hystérie-pithiatisme et troubles nerveux d'ordre réflexe en neurologie de guerre*. Paris: Masson et Cie; 1917.

In 1903 Babiński completed his initial description, by drawing attention to the abduction of the toes (“the fan sign”, “*signe de l'éventail*”) (5). Thus, in 1917, when discussing the signs useful to differentiate organic from hysterical hemiplegia, Babiński provided a comprehensive description of the sign: “the reflex movement of toes following stimulation of the foot sole is usually inverted: the toes and particularly the great toe instead of flexing extend on the metatarsus (phenomenon of the toes). The extension of the great toe is often associated with the abduction of the other toes (the fan sign)” (6). Of note, the corresponding figure clearly illustrates the extension of the great toe alone (Fig. 1).

Hence, although initially Babiński described the sign emphasizing the extension of all toes (“phé-

nomène des orteils”, “toes phenomenon”), later on - probably recognizing that extensions of all toes not always occur - he narrowed the definition by drawing attention to the extension of the big toe, and the abduction of the other toes. The BS was not described in its complete form from the very beginning, but it took some time for Babiński to fully realize that what characterized the sign was the extension of the great toe alone, and not of all toes.

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