

History of the ‘geste antagoniste’ sign in cervical dystonia

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Abstract The *geste antagoniste* is a voluntary maneuver that temporarily reduces the severity of dystonic posture or movements. It is a classical feature of focal and particularly cervical dystonia. However, the precise historical aspects of *geste antagoniste* still remain obscure. The goals of this review were (1) to clarify the origin of the *geste antagoniste* sign; (2) to identify the factors that led to its

diffusion in the international literature; (3) to follow the evolution of that term across the twentieth century. We used medical and neurological French, German and English literature of the late nineteenth and early twentieth centuries, and the PubMed database by entering the terms *geste antagoniste*, *antagonistic gesture* and *sensory trick*. The *geste antagoniste* sign is a legacy of the Paris Neurological School of the end of the nineteenth century. The term was introduced by Meige and Feindel in their 1902 book on tics, written in the vein of their master, Brissaud, who first described this sign in 1893. The almost immediate translations of this book by Giese into German and Kinnier Wilson into English contributed to the rapid spreading of the term *geste antagoniste*, which is still in use worldwide today. The term *antagonistic gesture* is the translation proposed by Kinnier Wilson, which also led to the use of the term *geste antagonistique*. The *geste antagoniste* sign has long been considered a solid argument for the psychogenic origins of dystonia until the 1980s when Marsden made strong arguments for its organic nature.

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Introduction

Dystonia is a hyperkinetic movement clinically defined as involuntary sustained or repetitive abnormal muscle contractions resulting in abnormal postures. It is also characterized by a cocontraction of the agonistic and antagonistic muscles and by the overflow phenomenon, consisting of the contraction of surrounding muscles during voluntary muscle activation. The *geste antagoniste*, also known as the ‘sensory trick,’ is a classical feature of focal dystonia. It

is defined by a voluntary maneuver that temporarily reduces the severity of dystonic posture or movements. It has been widely described in patients with spasmodic torticollis, but it can also be present in other focal dystonias such as blepharospasm and even in some cases of general dystonia. For this reason, the *geste antagoniste* is an important sign that should be searched for any time a dystonia is suspected. For example, in case of cervical tremor, the presence of a *geste antagoniste* reveals the dystonic nature of the tremor and helps to distinguish it from essential tremor. However, the historical aspects of *geste antagoniste* are only known by a few specialists, and especially the different steps in the history of this sign still remain obscure. The goals of this historical review were to clarify the origins of the *geste antagoniste* sign and to identify the factors that led to its rapid spread in the international literature of the late nineteenth and early twentieth centuries. An overarching goal was to follow the evolution of that term and its influence on the pathophysiological concept of dystonia across the twentieth century.

Methods

We started our search concerning the origins of the *geste antagoniste* sign using medical and neurological French, German and English literature of the late nineteenth and early twentieth centuries. We also used the PubMed database by entering the terms *geste antagoniste*, *antagonistic gesture* and *sensory trick*. We reviewed more than 60 scientific articles and books referring to these different terms.

Results

The widely used term *dystonia* was introduced in 1911 by Hermann Oppenheim [1] (1858–1919, Berlin). Before that, several names, such as tics, spasms and athetosis, were employed instead. The word *torticollis* is much older and used to be used for cervical dystonia [2, 3]. The term *torticollis* has its source in the sixteenth century with the famous French physician and novelist François Rabelais (1494–1553) in his novel *Pantagruel*: ‘...afin qu’il ne fust torty colly.’ One century later, the medical use of this term became more popular after Paul Scarron (1610–1660). Several masters of neurology, including Erb, contributed to the clinical and pathophysiological description of torticollis during the second half of the nineteenth century [4, 5].

The roots of the ‘*geste antagoniste*’ term in torticollis remain largely unknown. As cited by Steyerthal [2] and Cruchet [3], Georg Friedrich von Jäger (1714–1787) described torticollis in a thesis published in 1737 in Tübingen in Germany with the Latin title *Caput obstipum*

affectum variorem in librns et praxi. He noted that ‘some patients cannot turn their head without help from their hand; as soon as this help is removed the head instantly reverts to its initial abnormal position.’ This could be the first description of the *geste antagoniste*, but no specific term was proposed. In 1872 in Paris, Guillaume Benjamin Amand Duchenne (1806–1875) noted the positive effect of a voluntary contraction of all neck muscles in a case of spasmodic torticollis [6]. Erb also reported improvement of blepharospasm from pressure of defined points, ‘*Druckpunkte*,’ which are cutaneous areas innervated by the trigeminal nerve, and this observation led to treatment with electrical current applied to these points [4]. However, the identification and full description of *geste antagoniste* should be credited to the work of three neurologists from the Salpêtrière School in Paris, Brissaud and his pupils, Meige and Feindel, at the turn of the nineteenth and the twentieth centuries.

Edouard Brissaud (1852–1909) (Fig. 1) had an important share in the study of neurological disorders [7, 8]. He described pseudobulbar palsy, published a brain atlas, *Anatomie des centres nerveux*, in 1893, and did pioneering work on disorders related to psychic traumatism and proposed the term ‘sinistrosis’ for what is also called ‘compensation neurosis.’ Brissaud also gave an extensive description of tics and spasms in his 24th lecture in 1893 [9]. He contrasted on the one hand ‘spasms’ as mere phenomena originating in the spinal cord, which are only ‘reflexes,’ and on the other hand tics as coordinated phenomena originating in the cortex, which are automatism [9, 10]. Brissaud placed torticollis in the tic category and suggested the term ‘*torticolis mental*’ (i.e., ‘mental torticollis’) in order to emphasize the non-organic nature of torticollis, which he believed to be hysterical, in line with the contemporary convictions of the Charcot school of neurology. In addition, he described an important feature

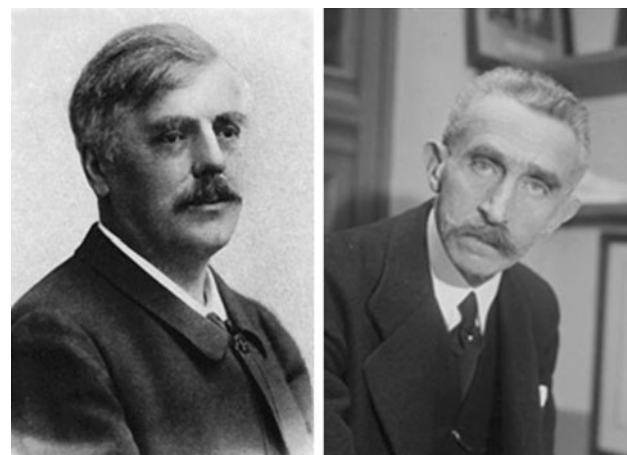


Fig. 1 Photographic picture of Edouard Brissaud (left) (Académie Nationale de Médecine) and of Henry Meige (right) (photo Henri Martinie, Roger-Viollet; www.parisenimages.fr)



Fig. 2 Woman with cervical dystonia (left) and a *geste antagoniste* (right). This picture has been used by Brissaud in 1895 as a clever illustration of his 24th lesson about tics and spasms

associated with *mental torticollis*. Actually, he reported seven patients with spasmodic torticollis. Interestingly, all of them attempted to prevent the abnormal movement by using their hand or finger, or by leaning their head against a wall. His clever description was particularly well illustrated by photographs of his patients (Fig. 2). In order to describe this phenomenon, he used the expressions: ‘*simple manie, détour puéril, supercherie malade*’ (i.e., ‘simple mannerism, childish behavior, pathological fake’). He described this phenomenon as a ‘*violente action musculaire corrigée par une réaction insignifiante*’ (i.e., ‘a violent muscular contraction reversed by a minor reaction’).

The term *geste antagoniste* itself was employed for the first time in 1902 by two of Brissaud’s disciples, Henry Meige (1866–1940) and Eugène Louis Clément Feindel (1862–1930) (Fig. 1). Meige is renowned for his extensive work on facial spasms and especially on the ‘*spasme facial médian*.’ His name is connected with Meige’s syndrome or idiopathic orofacial dystonia [11]. His colleague Feindel also participated in various medical studies and under Brissaud’s direction; he had a special interest in tics. In 1902, Meige and Feindel published a masterful book on tics written in the vein of their master, Brissaud [12], which covered all categories of tics, but also spasms, and as such might be considered as the first book dedicated to movement disorders. In this book, chapter 12 was entirely devoted to the *geste antagoniste* and ‘*stratagèmes*’ (‘stratagems’ or ‘subterfuges’). Meige and Feindel described that some patients ‘*sont conduits de la sorte à exécuter des gestes singuliers, à prendre des attitudes étranges, à utiliser des moyens de contention bizarres, procédés correcteurs quelque peu enfantins*’ (i.e., according to Kinnier Wilson’s English translation [13], ‘whose inventive faculty leads them to adopt singular attitudes, to execute curious gestures, to utilise elaborate apparatus—proceeding always more or less childish’). In the same chapter, they also used the terms ‘*subterfuge, stratagème* or *stratagème antagoniste*’ as well

as ‘*invention*’ to describe this phenomenon (i.e., in English: ‘stratagem, antagonistic stratagem, invention’). Following Brissaud, Meige and Feindel interpreted the *geste antagoniste* as proof of the psychogenic nature of ‘*mental torticollis*.’ Indeed, Meige and Feindel added, as translated by Kinnier Wilson: ‘in some cases the mere threat of this gesture suffices for the purpose;...before the patient has actually touched his face the mental torticollis is corrected by this antagonistic gesture;...it would be difficult to find more conclusive evidence of the purely psychical value of such corrective acts.’

Discussion

The *geste antagoniste* is a term commonly used in association with spasmodic torticollis, but it is also a major feature of several other focal dystonias. It is characterized by its clinical heterogeneity and the possible coexistence of different forms of *geste antagoniste* in the same patient that allow different degrees of relief [14–19]. This gesture can take the form of a classical sensory trick or of a ‘forcible’ trick [17, 20]. A ‘forcible trick’ consists of performing a forceful counter-pressure in opposition to the dystonic head turn, which may become necessary in more severe forms of dystonia where a purely sensory trick may not be sufficient to counteract the dystonia. The positive effect of the *geste antagoniste* tends to decrease as time passes. This can be responsible for a shorter time of relief and/or an increasing need for more forceful sensory stimulation to maintain the beneficial effects [15, 18]. In some cases, the *geste antagoniste* even becomes ineffective [15–18]. The *geste antagoniste* has also been used as a therapeutic strategy [21]. As shown above, the denomination *geste antagoniste* was used for the first time by Meige and Feindel, and is still being used more than one century later. This is related to the rapid translation of their book into English by Kinnier Wilson [13] and into German by O. Griefe [22]. The German literature of the early twentieth century referred to the *geste antagoniste* as ‘*antagonistische Bewegungen*’ or also ‘Brissaud’s maneuver’ (‘*Brissauds Handgriff*’) [23–25]. Samuel Alexander Kinnier Wilson (1878–1937), who worked in London at the National Hospital in Queen Square, played a great part in the diffusion of the *geste antagoniste* sign in English language medical journals [13, 26]. Among his numerous studies, in 1912 he described hepatolenticular degeneration, an illness that is currently called Wilson’s disease. In his 1907 English translation of Meige and Feindel’s book [13], he translated the *geste antagoniste* as *antagonistic gesture*.

One of the consequences of the identification of the *geste antagoniste* was that it subsequently and for a long time reinforced the belief in a psychological origin of Brissaud’s

mental torticollis despite several strands of evidence for an organic origin of torticollis and dystonia. [27–29]. Nevertheless, the idea of a psychological origin of torticollis was reinforced after an international congress on torticollis in Paris in 1929 [30–34]. Unfortunately, in the same meeting Meige was almost the only one to present an opposing view [18]. He proposed a relationship between torsion spasms in relation to basal ganglia pathology on the one hand and on the other hand some of his patients suffering from idiopathic spasmodic torticollis. This made him change his opinion on mental torticollis [18]. In addition, he had noticed several associations among torticollis, writer’s cramp, *spasme facial médian* and torsion spasm. Relying on their common features, Meige introduced the concept of focal dystonia as part of the clinical spectrum of Oppenheim’s generalized dystonia [18]. Regrettably, this important viewpoint was largely neglected by the mainstream of neurology with few exceptions [10]. Thereafter, focal dystonia was considered as a psychological disease that was treated by psychoanalysis for almost half a century [33–36]. In the 1980s, Charles David Marsden (1938–1998) clearly established the organic origin of cervical dystonia and other dystonic syndromes [33, 37]. Currently, the proposition of a psychological origin has given way to the modern view of dystonia as a disease of sensorimotor integration [38, 39]. The exact mechanisms of the *geste antagoniste* phenomenon remain unknown. Positron emission tomography for patients suffering from cervical dystonia has shown that the application of a sensory trick stimulus leads to increased activation of the superior and inferior parietal lobule ipsilateral to the original head turn and to a decreased activity of the supplementary motor area and the primary sensorimotor cortex contralateral to the head turn [39]. This reinforces the idea that the application of a *geste antagoniste* could exert a modulation of the sensory-motor intergration that is disturbed in dystonia [38–41]. This effect could be age dependent [17].

Nowadays the English expression *sensory trick* is also often used instead of *geste antagoniste*. This term stems from observations of Foerster who noticed that certain “Kunstgriffe” or tricks consisting of simple sensory input could improve athetosis in patients [42]. The terms *trick maneuvers* [40], *corrective gesture* [43], *reverse sensory geste* [44], *geste antagonistique*, which is an anglicism [13, 38] and, in French, *geste conjuratoire* (i.e., ‘conjuring gesture’) are also used, but less commonly.

Conflicts of interest None.

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