

Spanish eponyms in clinical neurology

S. Giménez-Roldán

Former head of Neurology, Hospital General Universitario Gregorio Marañón, Madrid, Spain.

ABSTRACT

Introduction. Despite criticism of the use of eponyms in medicine due to their inaccuracy, we cannot deny that they represent a way of honouring historical figures. We rarely reflect on how the use of these terms has persisted over time. No previous research has analysed the original descriptions of Spanish eponyms in clinical neurology and their later use in the medical literature.

Materials and methods. Research was carried out into original work by Spanish authors whose names gave rise to eponyms linked to clinical neurology and referenced by the authors' names. While Internet resources were employed (search terms including "eponyms", "Spanish authors", etc.), the main source used was a range of texts on the history of neurology in Spain. It cannot be guaranteed, therefore, that the search was exhaustive: there may be additional authors whose eponyms would warrant mention in this paper.

Results. Nine authors were found to have originated ten eponyms. These are presented in chronological order of the publication of the papers describing the eponyms. The literature continues to cite Lafora disease, Tolosa-Hunt syndrome, and Marín-Amat syndrome with relative frequency. The Barraquer reflex (grasp reflex of the foot), Tapia syndrome, and Sanchís-Banús syndrome (paranoid delusion of the blind) are mentioned only rarely in the literature today. Barraquer-Simons syndrome (cephalothoracic lipodystrophy) is occasionally cited in the endocrinology literature or linked to metabolic diseases. Mal de la rosa ("disease of the rose"), with the "Casal necklace" sign, is a classic of the history of pellagra. Only four of the authors found were neurologists or neuropsychiatrists; they all worked at hospitals in Madrid or Barcelona, and the majority of their publications appeared between 1906 and 1926, a period of relative prosperity in Spanish science. The fact that the articles found appear on ten occasions in languages other than Spanish (French, German, and English) demonstrates the importance of the language barrier in the dissemination of science.

KEYWORDS

Eponyms, clinical neurology, Casal, Tapia, Cajal, Barraquer Roviralta, Lafora, Marín Amat, Sanchís Banús, Marañón, Tolosa

Introduction

In medicine, the adjective "eponymous" usually refers to a specific sign or symptom, syndrome, disease, or anatomical structure. This use of language has its detractors, and they do not lack justification: the unfairness of excluding the names of the researchers who did the work and honouring only the director of the laboratory or clinic where the research was performed¹;

the overabundance of proper nouns, for example in brainstem syndromes, whose definitions are subject to disagreement among neurologists²; and not to mention the over 30 eponyms in neurology acknowledging Nazi criminals.³ Outspoken critics of the use of eponyms have included Sir William Gowers (1845-1915), the renowned Victorian neurologist whose name is associated with Duchenne muscular dystrophy and one of the spinocerebellar tracts.⁴ These are all justified arguments



Figure 1. The title page of the *Historia Natural y Médica de el Principado de Asturias* and an original illustration from Casal's book (p. 328), showing the areas typically affected by lesions in "mal de la rosa": the backs of the hands and feet, and the Casal necklace around the neck (images reproduced from the original book, Spanish National Royal Academy of Medicine [RANM]). The text reads: "A posthumous work of Dr Gaspar Casal, physician to his Majesty, Protophysican of Castile, and member of the Royal Academy of Medicine of Madrid. Brought to light by Dr Juan Joseph García Sevillano, physician to the family of our Lord the King, examiner of the Protophysicians, physician formerly of the Royal Hospitals and currently of the Royal Palace of Buen Retiro, and member of the Royal Academies of Medicine of Madrid and of Porto". Spanish translation of the Latin original consulted in: *Mal de la Rosa, Su historia, causas, casos, curación*. Tipografía de los Laboratorios del Norte de España, 1936, Masnou, Barcelona.

for renouncing eponyms in favour of descriptive terms.⁵ However, this remains an unrealistic prospect: how could we stop using terms like the Babinski sign or Parkinson's disease? Besides their evocative power, eponyms bring historical rigour to medicine and acknowledge the work of those responsible for the advancement of our science.⁶⁻⁸ While Spanish eponyms relating to the nervous system are relatively few in number, they are by no means insignificant. According to Ezpeleta⁹, only eight of 2078 medical eponyms (609 in the field of neurology) are attributed to Spanish authors; more specifically, these are mainly related to neurohistology. Research for the present article found a somewhat larger number.

This article aims to recover the original descriptions by nine Spanish authors whose eponyms are related to clinical neurology and have warranted reference in the medical literature.

Material and methods

Nine Spanish authors were found who have been attributed eponyms, whether related to diseases, syndromes, or neurological signs. In chronological order of the publication giving rise to the eponym, the authors are as follows: Casal (1762), Tapia (1905), Barraquer-Roviralta (cephalothoracic lipodystrophy; 1906), Cajal (interstitial nucleus; 1909), Lafora (1911), Marín Amat (1919), Barraquer-Roviralta (grasp reflex of the foot; 1921), Sanchís Banús (1924), Marañón (1926), and Tolosa (1954). Selection criteria were that the eponyms were pertinent to clinical neurology, and the fact of having been cited as such in the medical literature.

Following identification of these authors, the article or book giving rise to the eponym was located, and the full text, the full reference, or most important excerpts were transcribed. Although such authors as Del Río Hortega, Achúcarro or Cajal are very often cited, they were excluded (with the exception of the interstitial nucleus of Cajal) for not being directly connected with clinical neurology.

Results

Casal disease or *mal de la rosa* (1762)

In some sense, Gaspar Casal Julián (Gerona, 1680-Madrid, 1759) salvaged the image of Spanish science from its unhappy situation in the 18th century. He received no university education, perhaps to his benefit, according to Marañón.¹⁰ He completed his studies at the college of Sigüenza as little more than a tooth-puller, but during his travels around La Alcarria and Soria, Casal, now a licensed physician, honed his observational skills. In 1718, aged almost 40, Casal had the good fortune to find himself in Oviedo, where Father Feijoo, a fearsome polemicist against doctors of his time, represented a refuge of wisdom in his cell in the convent of Saint Vincent. He provided Casal with books, introduced him to foreign masters, and encouraged his interest in experimentation.

Work that stands the test of time tends to have an extended gestation, and Casal wrote his magnum opus *Historia Natural y Médica de El Principado de Asturias* (1762) near the end of his life, when he was serving in Madrid as a physician in the royal chambers of Ferdinand VI (Figure 1).¹¹ The work was published three years after he died, thanks to Juan José García Sevillano, a

former colleague from the Protomedicato, the body that regulated the medical profession in Spain. Much is yet to be fully understood about Casal's life, such as his mother María Ruíz's persecution by the Spanish Inquisition.¹²

Gaspar Casal described *mal de la rosa* in the fourth text of his book, *Historia affectionum quarundam regionis hujus familiarum*, in which he addresses diseases endemic to Asturias.

[...] It is the most terrible and refractory of all endemics in this region [...]. Only one of [its symptoms] is given the common name: a terrible scab that, though at first only reddens the affected spot and leaves it with a somewhat rough crust, eventually degenerates into an extremely dry, rough, and blackish scab, broken by deep cracks that penetrate to the living flesh [...]. To merit the name of "mal de la rosa", this malignant crust must be attached only to the metacarpus or matatarsus on the hands or feet [...]. It is well to know that these scabs develop almost always near the spring equinox, and very rarely at any other time. In the summer they are usually sloughed off [...] but the red stigma remains [...] like the scars that usually remain when burns have healed [...]. It returns every year in the spring, like the swallows [...]. There is another visible sign of this disease, which is a darkly ashen, crusty roughness on the lower front of the neck which extends in the form of a collar¹³.

A keen epidemiologist, Casal attributed the disease, which we now know to be a nutritional disease caused by a niacin (vitamin B₃) deficiency, to *mijo de Indias* or maize, a staple for the peasant workers of Asturias. Besides the typical "three Ds" (dermatitis, dementia, and diarrhoea) memorised by every student of medicine, the disease can have more complex neurological manifestations, including headache, peripheral neuropathy, and sensory or cerebellar ataxia.¹⁴

From 1751, François Thiéry, court physician to Louis XIV in France, who had met Casal in Madrid, disseminated the latter's discoveries across Europe.¹⁵ Pellagra is almost forgotten about today: in one drug-addicted patient with severe malnutrition, it took years for the condition to be diagnosed.¹⁵ Looking back to a besieged Madrid in the Spanish Civil War, pellagrous psychosis was the most frequently observed manifestation of nutrition disorders.¹⁶

No known image exists of Gaspar Casal, besides a tile depicting an imaginary figure, which was to be displayed in an Oviedo street and which Carlos Hernández Lahoz generously sent to Bruyn and Poser to be used as an illustration in their extensive historical review of

pellagra. The city's officials are yet to decide where to place the tile.¹⁷

Tapia syndrome (1905)

Antonio García Tapia (Ayllón, Segovia, 1875-Madrid, 1956) was the founding member of a lineage of otorhinolaryngologists (father, son, and grandson). His early life was difficult: the son of a rural physician, García Tapia fought in the Philippines, where he contracted yellow fever. He specialised during a long journey around Europe, but his greatest successes were in Madrid, where he funded an otorhinolaryngology dispensary under the municipal health system, was president of the National Royal Society of Medicine from 1915 to 1917, and held the position of chair at Colegio de Cirugía de San Carlos from 1926. "He was the professor who taught everything: from the most abstruse of physiological theories to conduct towards patients," writes Marañón¹⁸ (Figure 2A).

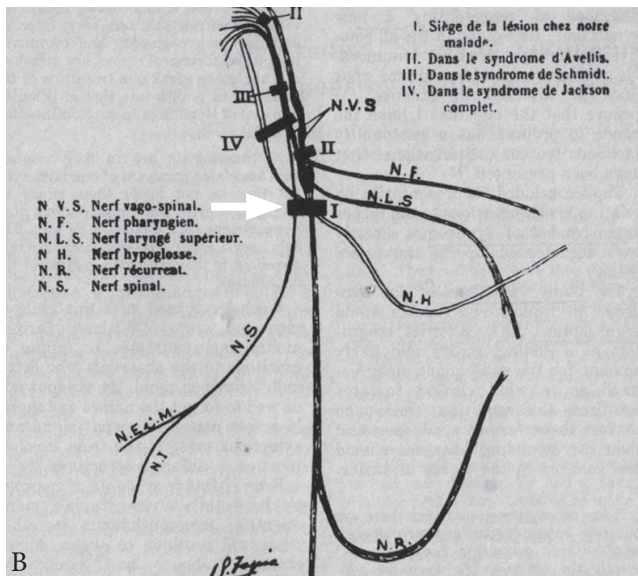
In 1905, now a renowned otorhinolaryngologist, García Tapia published an article in *El Siglo Médico* describing the case of a bullfighter suffering significant neurological sequelae after being gored in the ring.¹⁹⁻²⁰

The patient was a man aged thirty, a bullfighter, who attended my clinic for the poor on 20 January 1904 with acute coryza. However, the hoarse, bitonal voice, typical of patients with laryngeal paralysis and paralysis and atrophy of the right side of the tongue [...] made me realise that I had a most interesting case before me. On 2 September 1895, while planting a pair of *banderillas*, he was struck in the side of the neck by the bull's horn, slightly behind the angle of the mandible. At the time, he was rendered almost completely unable to produce voiced sound, his tongue dragged, and he experienced difficulty swallowing saliva [...]. He was not permitted to continue the fight due to profuse bleeding. He recalls the wound being sutured, but suddenly lost consciousness three hours thereafter. He was told that he recovered consciousness within 36 hours, awaking to discover his left arm and leg were paralysed and his face twisted to the right-hand side. [...] Paralysis gradually faded, to the extent that there was no sign of hemiplegia eight months after the accident; however, the hoarseness, dysarthria and swallowing persisted, albeit with some improvement.

Examination revealed a scar of around 2 cm in length at the lower edge of the right parotid area, immediately below the jaw, stretching obliquely upward and backward [...], almost reaching the sternocleidomastoid muscle [...]. The right sternocleidomastoid and trapezoid muscles were



A



B

Figure 2. Dr García Tapia as a young man (A) and his elaborate diagram (B) showing that the lesion affects (from left to right) the spinal nerve (NS), the recurrent laryngeal nerve (NR), and the hypoglossal nerve (NH). The superior laryngeal nerve (NLS), just above the lesion (arrow added), remains intact.

paralysed, and when the patient moved his tongue forward, the tip strayed toward the injured side, while the right side of the tongue showed atrophy. Soft palate mobility was intact, without absolutely no indication of paralysis. Laryngoscopy showed that the right vocal cord was completely paralysed. Laryngeal sensitivity was intact.

García Tapia's first consideration was how the left hemiparesis, which manifested hours after the accident, may be related to the other findings. Although mitral stenosis was subsequently detected, he believed that the carotid artery had probably suffered a contusion during the accident, followed by thrombosis and cerebral embolism. What Tapia did not understand was why soft palate mobility remained intact in spite of the paralysed spinal and hypoglossal nerves. A second paper displayed his masterful knowledge of anatomy, including a detailed diagram distinguishing the lesion site in his case from those present in Avellis, Schmidt and Jackson syndromes. In Tapia's patient, the lesion would have been just below the superior laryngeal nerve, responsible for soft palate mobility, which would explain the absence of alterations to the soft palate. Tapia's articles were published simultaneously in Spanish and in French, which was not uncommon at the time.^{21,22}

A year later, he had observed a further three cases (one of them also in a bullfighter) with ipsilateral vocal fold and hemilingual paralysis, but no involvement of the sternocleidomastoid and trapezoid muscles, which would have been present if the lesion had been slightly lower, respecting the spinal nerve, according to Tapia's illustration (Figure 2B).

In one of life's ironies, the physician, a renowned expert in auditory diseases, developed severe hearing loss in the final years of his life. When the Nobel prizewinner Jacinto Benavente visited him as a patient, he exclaimed: "Don Jacinto, you came to see me for this, did you not?" signalling his own ear. "Well, I am afraid that nothing is to be done! When they invent something to help me, I will let you know."²³

Tapia syndrome was disqualified for being "erratic", due to varying descriptions in numerous American texts²⁴ confounding the condition with García Tapia's second publication.^{21,22} This confusion may be explained by the limited access to the original article and insufficient understanding of Spanish and French, the languages in which it was published.

This author believes that the true interest of Tapia

syndrome lies in its status as a unique example of alternating paralysis in which rather than being located on the brainstem, the lesion is extracranial, at the level of the neck.

Cephalothoracic lipodystrophy or Barraquer-Simons syndrome (1906)

Luis Barraquer Roviralta (Barcelona, 1855-1928) was indisputably the father of neurology in Catalonia and one of the pioneers of the speciality in Spain as a whole. His eponym is linked to cephalothoracic lipodystrophy, or Barraquer-Simons syndrome, as well as the grasp reflex of the foot as a manifestation of prefrontal lesions (the “Barraquer reflex”).^{25,26} Those who worked with him recall an astonishing capacity to imitate the semiological peculiarities of neurological conditions in his lectures. He was also known for the way he spoke, “a model of verbal architecture, seductive in its clarity and succinctness.”²⁷

Barraquer Roviralta published the case of the patient with cephalothoracic lipodystrophy in 1906. The author of these pages possesses a 15-page pamphlet, probably an offprint.²⁸ A year later, the text also appeared in a German journal.²⁹ The article included three photographs of the patient, including two of her face, (at rest and smiling) and a full-body image showing her almost fully dressed, clearly of little use to illustrate the thoracic involvement (Figure 3).

The patient I.P. was a 25-year-old woman referred by the paediatrician Dr P. Ribera Mallofré, who reported rapid weight loss in the face and upper chest starting at age 13. This was contrasted by normal weight in the rest of the body [Barraquer omits the patient's body measurements “out of respect for the patient”]. I shall say that as regards adipose tissue from the thorax down, nutritional development perfectly corresponds to what we would expect in a healthy, post-pubescent woman. In the upper part of her body, the condition especially affected the face, which was very thin and pale on both sides, but perfectly symmetrical. [...] It is differentiated from conditions caused by high temperatures or consumption [...] by the liveliness, promptness and the expressiveness of her features.

We should note Barraquer's thorough physical examination of his patient, doubtless thinking of neurological manifestations of numerous systemic diseases. He explains that “the skin in the affected areas was thin, but not atrophic, and had normal elasticity.” He also notes the absence of goitre and the preserved mobility of the eyes and eyelids, presumably to rule out Basedow disease.



Figure 3. Cover of Barraquer-Roviralta's article, showing the patient inflating her cheeks and smiling; also shown is a full-body photograph (note that the patient is clothed, making it impossible to observe the thoracic component of the lipodystrophy).

In the discussion section, he meticulously analyses the possibility of scleroderma, facial hemiatrophy, or “Parry disease”, as well as trophic disorders secondary to such nervous system diseases as syringomyelia. The possibility of “keratoderma caused by elastic tissue or collagen alterations was excluded due to the absence of skin abnormalities.” Regarding facial hemiatrophy, he mentions a potential association with a trigeminal neuritis, but dismisses this on account of the strict symmetry of the atrophy and its extension to the upper half of the trunk.

Barraquer's favoured hypothesis was a trophic disorder of the adipose tissue secondary to an undetermined lesion of the sympathetic nervous system. However, this explanation did not satisfy him, demonstrating his precision in localisation and his great knowledge of anatomy:

The trophic disorder of the adipose tissue must include a trophism of the face [...] but does not extend as far as the stellate ganglion, the adjacent portion of the limiting cord, the nerve root fibres of the fourth dorsal nerve, or the corresponding segments of the spinal cord, as the upper limbs are well developed.

The second member of the dynasty, Barraquer-Ferré, named the condition “Barraquer disease”, clarifying that Simons' work was published five years later than

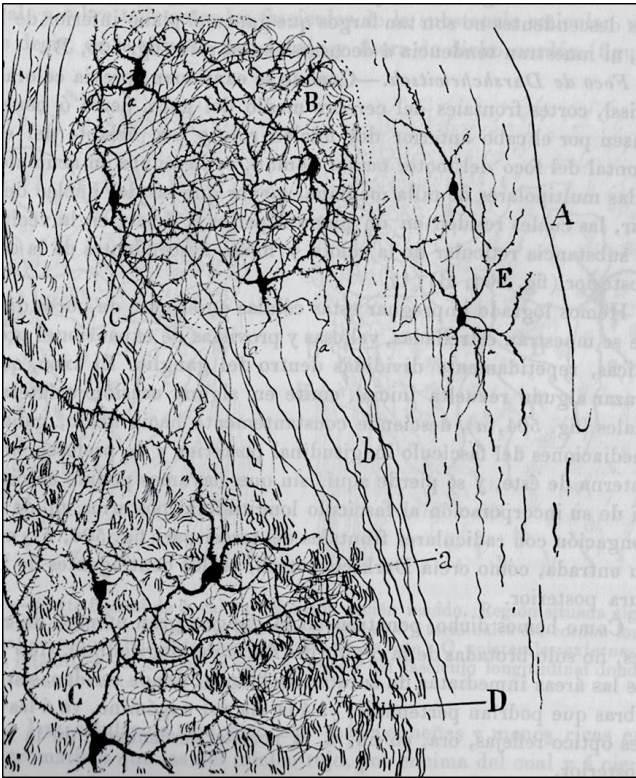


Figure 4. Interstitial nucleus of Cajal “in a cat of a few days old”, reproduced from figure 504 of *Histología del Sistema Nervioso de los Vertebrados*. The aqueduct of Sylvius can be seen at the right of the image (A). The “focus” (sic) of Darkschewitsch is shown in the upper part of the image (B); structure C (at the bottom of the image) is the “interstitial focus of the anterior end of the posterior longitudinal fasciculus”. Annotation (a) indicates “the pericellular nests of the interstitial focus”, close to the axons of the nucleus of Darkschewitsch (b).

his father's.³⁰ Barraquer analysed 10 of his own patients, providing images depicting their symptoms. One patient presented cephalothoracic lipodystrophy (in this case, the patient was shown partially undressed). Given that the patient's mother and daughter also appeared to be affected, he postulated a hereditary degeneration of the hypothalamus.

Barraquer-Roviralta's publication sparked considerable interest across Spain, with a proliferation of contributions appearing, although perhaps lacking reliability at times.^{31,32} At present, cephalothoracic lipodystrophy is considered to be a syndrome of unknown origin.³³ Unlike generalised forms, it tends not to be associated with insulin-resistant diabetes or kidney failure.³⁴ The

majority of patients are carriers of an IgG-type serum immunoglobulin which causes adipose tissue lysis through the expression of the serum protein adipsin.³⁵

Arthur Simons (1879-1942), the second author referenced in the eponym, lived a tragic life. A German neurologist of Jewish origin and follower of Hermann Oppenheim (1858-1919) at the Berlin Charité, Simons was expelled from his post as an extraordinary professor after the Nazis came to power. He was imprisoned at the Vaivara concentration camp in Estonia, where he was murdered. A recently recovered film from 1916-1919 shows Simons demonstrating how rotation of the neck affects the paralysed limbs of patients. The flexion and extension of the paralysed limb (*Mitbewegungen* or “Walsh associated reactions”) were his greatest research interest.³⁶

Interstitial nucleus of Cajal (1909)

The interstitial nucleus of Cajal (INC) is a small structure located in the rostral midbrain, dorsomedial with relation to the anterior pole of the red nucleus. In conjunction with the nucleus of Darkschewitsch and the interstitial nucleus of the medial longitudinal fasciculus (inMLF), it is part of the premotor system regulating vertical eye movement.^{37,38} The INC's role is to maintain fixation of the eyes following an ocular saccade.³⁹

Cajal described this body in what Francisco Tello (1880-1958) called the “second period” of his scientific life.⁴⁰ Cajal, while holding the chair of anatomy in Barcelona (1887-1892), was determined to put the Golgi method of silver staining to good use, and began applying it systematically to different anatomical structures of the nervous system. Cajal's description of the INC appeared in his magnum opus, the *Histologie du système nerveux de l'homme et des vertébrés* (Histology of the nervous system of man and vertebrates), published in French in 1909 and translated into Spanish in 2007.^{41,42} He addressed the body in his description of the structure of the “posterior longitudinal fasciculus” in frontal sections taken from brainstems of neonatal mice:

Note the way in which the fibres of this bundle are dispersed, leaving space for the cells of the *interstitial focus* [original italics], and the way in which their trajectory gives rise to three types of collateral fibre [...]. The descending fibres have been demonstrated in lower vertebrates by Edinger, van Gehuchten, and by my brother [...]. The posterior longitudinal fasciculus sharply reduces in size, and at the same time becomes plexiform; [inside] there

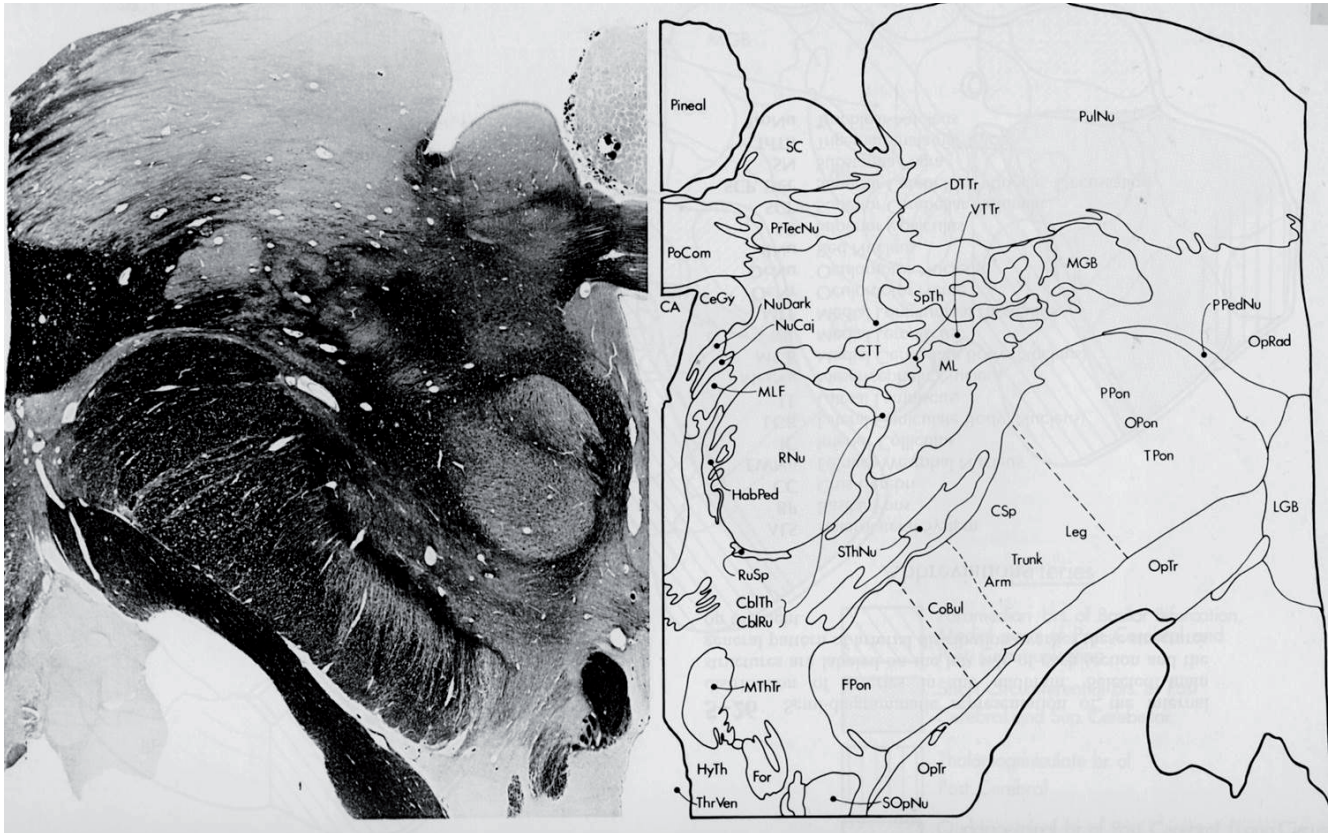


Figure 5. Pretectal area, with a semischematic depiction (right) showing the nucleus of Darkschewitsch (NuDark), the interstitial nucleus of Cajal (NuCaj), and the medial longitudinal fasciculus (MLF). Taken from D.E. Haines.⁴⁴

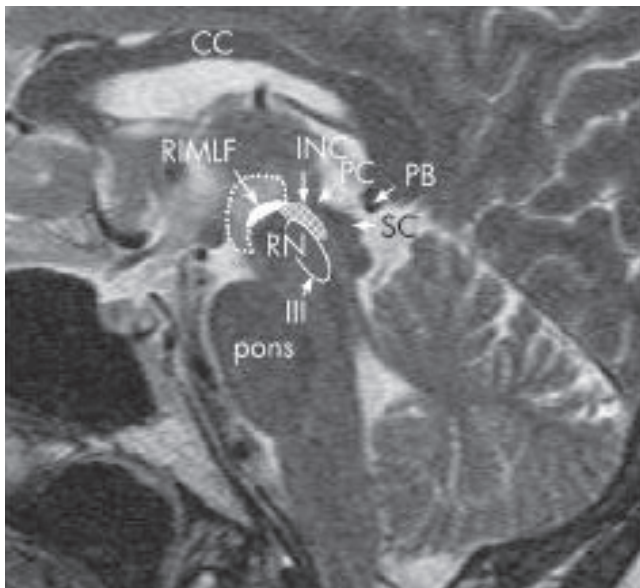


Figure 6. Localisation of the interstitial nucleus of Cajal (INC) in T2-weighted magnetic resonance images, above the posterior part of the red nucleus (RN) and below the posterior commissure (PC). Note the anatomical difference between the rostral interstitial nucleus of the medial longitudinal fasciculus (RIMLF) and the INC.³⁹

is a focus [of neurons] which we had not ourselves recognised in our early investigations [of the red nucleus]. We call this accumulation of grey matter the interstitial focus due to its location among the somewhat dispersed bundles of the longitudinal cord (Figure 4).

The anatomical complexity of the region has been problematic for the determination of the exact clinical correlate of potential lesions limited to the INC (Figure 5),^{43,44} which can now be identified by magnetic resonance imaging (Figure 6).³⁹ According to some authors' interpretation, the preservation of vertical oculocephalic movements in Parinaud syndrome would indicate that the structure is undamaged.⁴⁵

Lafora disease (1911)

Nicolás Achúcarro (1880-1918) and Gonzalo Rodríguez Lafora (1886-1971), six years his junior, first met in Madrid, at the histology laboratory shared by Luis



Figure 7. Gonzalo Rodríguez Lafora on finishing his medical studies (A; taken from Valenciano Gaya^{47(p33)}); several localisations of corpora amylacea (B).⁵⁴

Simarro and Juan Madinaveitia at Calle General Oráa 3. Lafora was still a third-year medical student, and Achúcarro was soon to finish his degree.⁴⁶ Lafora's participation in a study led by Simarro on the nervous system of fish led to his being awarded a grant to study the anatomy of the nervous system from the Board for Study Extensions on 15 December 1908, aged just 22 years old. At the psychiatry clinic at La Charité in Berlin, Lafora would admire the work of the director, Ziehen; however,

it was his time working with Emil Kraepelin (1856-1926) and Alois Alzheimer (1864-1915) at the *Nervenklinik der Maximilianum Institut* in Munich that would leave a profound mark on the future neuropsychiatrist's training (Figure 7 A).^{47,48}

Achúcarro had already worked for a year in the neuropathology laboratory of the Government Hospital for the Insane (now Saint Elizabeths Hospital) in Washington, D.C., where he had been accepted on recommendation from Alzheimer.⁴⁹ He wanted to return to Spain to marry his cousin, Lola Artajo; the hospital's superintendent, Dr William A. White, had agreed to allow Lafora to substitute him. The young medic never could have imagined that that letter of acceptance, dated November 1909, would lead to his becoming an enduring name in the history of science. While the laboratory was well equipped in terms of technology, Lafora had only a limited knowledge of English⁵⁰ and was not convinced by his director Adolf Meyer's (1866-1950) view that "mental hygiene" was conditioned by social influences.⁴⁷ In all, Lafora spent two fruitful years in Washington (May 1910 to September 1912).

His first year, 1911, was particularly productive scientifically: he published a total of nine works, with three appearing in English, one in Spanish and five in German.⁴⁶ This work included a paper he published with Bernard Glueck, on progressive myoclonus epilepsy, which would give rise to the best known of all the Spanish neurological eponyms.⁵¹

A 17-year-old boy was admitted to the Government Hospital for the Insane in Washington in April 1910. Family history of alcoholism and epilepsy. Poor academic performance. In 1909, he began experiencing epileptic attacks [...] and in 1909 'myoclonus [appeared] in the muscles of the eyes and lips, later spreading to the muscles of the patient's limbs and trunk.' Later, he began to exhibit 'decreased visual acuity [...], which continued to progress [...], and loss of memory and intelligence'. Upon admission, the patient showed general hypertonia, constant, generalised myoclonus, exaggerated tendon reflexes and mechanical sensitivity, double Babinski sign [...] and double papilloedema. In the final phases of progression, dementia, perseveration and echolalia appeared, accompanied by daily epileptic seizures. Decompressive craniectomy was performed. Weeks later, the patient died during an epileptic seizure.

The autopsy revealed no brain abnormalities, with the exception of a certain degree of atrophy of the Purkinje cells. The most striking finding was the presence of corpora amylacea in the cerebral cortex,

predominantly in the second and third layers [...], with a particular proliferation in the visual cortex. The Betz cells displayed only mild chromatolysis and no corpora amylacea. Corpora amylacea were also found in the quadrigeminal bodies, pons, medulla oblongata, and in the posterior and lateral horns of the spinal cord; few were observed in the anterior horn (Figure 7 B).

Bernard Glueck, who co-authored the paper and was responsible for the clinical data, was 27 at the time. Although he would later become a distinguished forensic psychiatrist,⁵² his experience in neurology would presumably have been limited. Curiously, his obituary does not mention his collaboration with Lafora. Objectively, the patient's clinical history was not particularly precise: it does not identify such typical symptoms as paroxysmal visual manifestations⁵³; nor is persistent, progressive blindness a feature of the disease. The most unusual element of the report is that the patient developed papilloedema; this led to an exploratory craniotomy, which perhaps precipitated the patient's death. The same year, Lafora published an article, this time as the sole author, on the histopathological characteristics of amyloid corpuscles, as he called them, describing no fewer than 14 different staining properties.⁵⁴

In 1963, Van Heycopten Hamm and De Jager proposed the denomination "myoclonus epilepsy with Lafora bodies" after studying two sons of consanguineous parents, also noting significant anomalies in electroencephalography readings.⁵⁵ In 1965, Schwarz and Yanoff referred to the entity as Lafora disease, a distinct clinico-pathological form of Unverricht syndrome.⁵⁶

Throughout his life, Lafora repeatedly returned to corpora amylacea to defend his description, which was attacked from various sides.^{57,58} Today, corpora amylacea are identified as PAS-positive intracytoplasmic inclusions composed of polyglucosans. The role of laforin is unknown. A mutant version of the protein is present in 80% of cases, potentially giving rise to glycogen synthetase hyperfunction and the formation of the inclusions observed in many organs.^{59,60} Skin biopsy has emerged as a diagnostic method to reveal the characteristic PAS-positive inclusions in the excretory ducts of the eccrine sweat glands, although it is now also possible to detect the mutation of the causal gene, *MTTK*. However, and without disregarding his praiseworthy first description of a new anatomo-clinical entity, perhaps the most important achievements of "the maestro Don

Gonzalo" were his neurological and psychiatric work and the school of neuropsychiatrists that followed him.⁶¹

Marín Amat syndrome or inverse Marcus Gunn phenomenon (1919)

On 28 August 1917, Dr Marín Amat, who had already earned prestige as an ophthalmologist at the Hospital Provincial in Almería, was following his usual routine of consultations. C.G., an 18-year old woman, had travelled from the village of Albánchez seeking medical attention for ectropion: yet another case of trachoma to include in his already extensive series (Figure 8).⁶² But his examination of the patient revealed a striking phenomenon: the drooping right eyelid, which the patient had had since birth, rose with chewing motions. When she opened her mouth wide, the upper lid rose so far as to leave a large part of the sclera uncovered. "It's a congenital tic, we've been told it doesn't have a cure," the mother noted. Marín Amat was completely certain of the diagnosis: a typical case of Marcus Gunn syndrome.

The situation of M.X., a 56-year-old man, was rather different. Following violent trauma to the right cheek, M.X. experienced optic atrophy, deafness, and peripheral facial paralysis on the ipsilateral side of the face, with severe lagophthalmos and loss of tearing. One year and a half later, the patient requested that his tarsorrhaphy be removed.⁶³

The right orbicularis now contracts normally, as do the muscles innervated by the facial nerve [...]. The right eye opens and closes simultaneously and with the same strength and speed as its counterpart. [...] *When the patient chews, there is an uninterrupted flow of tears* and the patient must constantly wipe his nose and cheek. We also observed an even stranger phenomenon, one which we have never before seen described. When the lower jaw moved, synergistic contractions can be clearly observed in the right orbicularis. As the jaw opens, the eyelid also descends, with the palpebral fissure remaining closed until the lower jaw is raised. We observed the same contractions with lateral jaw excursion during mastication, but not when crying, laughing, coughing, yawning, etc. We can conclude from this that the patient has *an inverse Marcus Gunn syndrome or phenomenon* [italics added].

Marín Amat describes the differences between his two cases; the young woman had congenital ptosis which momentarily reverted with each masticatory jaw movement: a case of Marcus Gunn syndrome. In the second patient, the condition appeared following

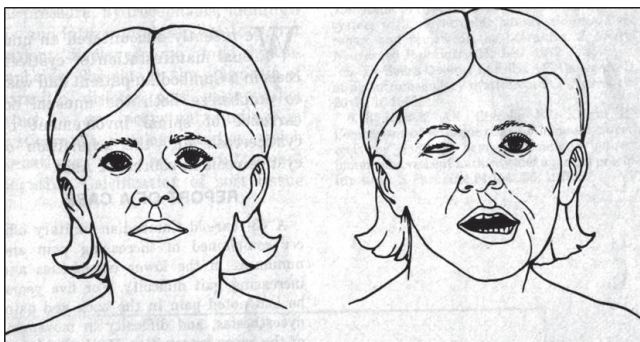
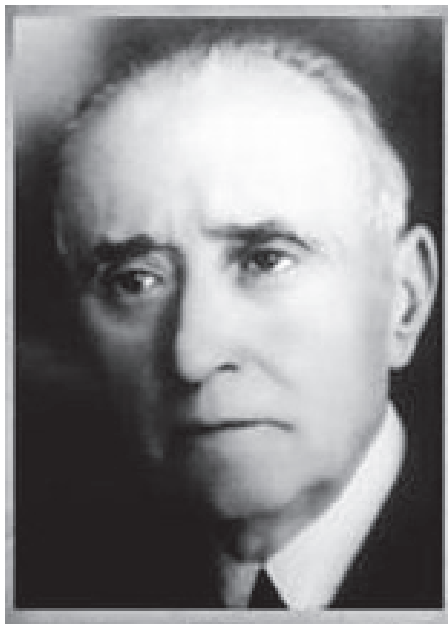


Figure 8. Dr Marín Amat as a young man and later in his life (images taken from RANM). Diagram depicting Marín Amat syndrome. Unlike with the Marcus Gunn phenomenon, ptosis is not observed in the primary gaze position; the palpebral fissure reduces in one side of the face as the jaw moves to the other.

recovery from a serious lesion to the facial nerve⁶⁴; in this case, the palpebral fissure was normal at rest, with the eyes closing when the patient ate. Referring to Testut's acclaimed treatise on anatomy, he concludes that the condition had never before been described. Marín Amat named the condition "inverse Marcus Gunn syndrome", attributing it to an aberrant regeneration of the nerve "when its fibres reach different territories".

Marín Amat was not mistaken in reaching these conclusions; the phenomenon mainly appears following peripheral facial paralysis with incomplete recovery and aberrant facial nerve regeneration due to anastomosis between the facial nerve branch for the palpebral orbicularis and the trigeminal nerve branch for the muscles of mastication.^{65,66} However, electromyographic examination of the ocular muscles in Marín Amat syndrome suggests two possibilities for pathogenesis. Some cases are explained by inhibition of the levator palpebrae superioris due to forced opening of the mouth, in which case the upper lid descends without concomitant orbicularis oculi activity.⁶⁷ In other cases, the palpebral fissure closes due to synkinesis between the orbicularis oculi and the lateral pterygoid muscle.⁶⁸ Therefore, electrophysiological examination of the ocular muscles would be essential if the intended treatment involves tucking the levator palpebrae superioris or the application of botulinum toxin to the orbicularis oculi.⁶⁹

The passing years have not diminished the originality of the purely clinical research of Manuel Marín Amat (Roquetas de Mar, Almería, 1879-Madrid, 1972). A man of humble origins, Marín Amat initially worked as a rural physician in Almería, later specialising in ophthalmology and ultimately becoming an instructor in the specialty at the Hospital Provincial in Madrid.

If we analyse the original publication, we can see the association between the Marín Amat phenomenon and the so-called "crocodile tears syndrome". In the latter, parasympathetic fibres of the preganglionic portion of the facial nerve are misdirected to the lacrimal gland during regeneration, instead of reinnervating the salivary glands. As far as we are aware, there has been no previous mention of this "double effect" of aberrant facial nerve regeneration in Marín Amat syndrome. Were he to receive this patient in the present day, the good doctor would have treated the unwelcome tears with a simple botulinum toxin injection in the lacrimal gland.⁷⁰



FIG. 2
 erniers du côté sain, tandis que, au contraire, le chatouillement de la plante du pied non paralysé amenait une flexion des orteils des deux côtés. En présentant ce cas, je ne dois pas supposer que d'autres cliniciens n'en aient pas observé d'analogues. De toutes façons, il est digne d'être mis en ligne de compte, parce qu'il constitue un bon exemple du signe des orteils absolument inversé par suite de la flexion plantaire forcée de tous les orteils, notamment du gros, sous l'effet de l'excitation plantaire du même pied.

Figure 9. The plantar grasp response, according to Barraquer-Roviralta. The patient shown is a boy, showing evident flexion of the right arm (left). Unlike the plantar reflex, the plantar grasp response is in this case produced by stimulating the sole of the foot with gentle pressure (right), as in the palmar grasp reflex.

The Barraquer reflex, or plantar grasp response (1921)

In 1921, Barraquer Roviralta published a short article, barely three pages in length, in the prestigious journal *Revue Neurologique*.⁷¹ In the article, entitled “Contribution à l'étude du réflexe plantaire pathologique”, he asserts that “the eloquence of the two figures accompanying the study say it all”, no doubt in justification of its short length (Figure 9).

The patient was a 12-year-old boy who had suffered acute-onset hemiparesis during the progression of an infectious disease. The physician was surprised by the “extreme, forced and sustained” flexion in response to stimulation of the sole of the foot. In a sense, writes Barraquer, this constitutes an inversion of the classic

Babinski sign. It is distinguished from the normal plantar reflex by the forced, sustained nature of the phenomenon and the flexion of all the phalanges. The phenomenon had gone unnoticed until that time, however Barraquer did not attempt to explain the pathogenesis of the reflex or its significance in terms of localisation.

The plantar grasp response is considered normal in the first six months of life; an absent or weak response in infancy is a predictor of underlying neurological abnormalities.⁷² In adults, it may occur only when walking,⁷³ in which case it would represent a focal form of action dystonia following anterior choroidal artery infarcts.⁷⁴ However, the plantar grasp response is most frequently caused by premotor cortex lesions.

Sanchís Banús syndrome or paranoid delusion of the blind (1924)

José Sanchís Banús (Valencia, 1898-Ibiza, Alicante, 1932) was an unusual character in the Madrid School of Neurology prior to the Civil War: despite working in neurology, psychiatry, and psychology at the Hospital Provincial in Madrid, he lacked training in neurohistology, unlike Achúcarro, Gayarre, and Lafora, who combined their clinical work with the teachings of Cajal and Luis Simarro.⁷⁵ Marañón describes him as “a clear-headed, universally knowledgeable man with a natural sense of devotion to the sciences; at the same time, he is a combative man, incensed by the uncertainty of the times,” perhaps alluding to his commitment to the Socialist Party (Figure 10).⁷⁶

In 1924, he published a paper on paranoid reactions in blind people in the journal *Archivos de Medicina, Cirugía y Especialidades*, where he was editor-in-chief.⁷⁷ The article focuses on two patients with acquired blindness, who “due to environmental pressures” developed delusions (persecution delusion in one patient and morbid jealousy in the other) and both of whom attempted suicide. The condition was referred to as “Sanchís Banús syndrome” in Oswald Bumke's⁷⁸ prestigious *Handbook of Medical Diseases*, where it was classified together with persecution delusion of the deaf. Many Spanish neuropsychiatrists have also referred to the entity.

The first case was a 52-year-old beggar, who had been blind since the age of five due to trachoma. He was arrested following a government order to detain beggars. In a state of panic, he locked himself inside his house



Figure 10. José Sanchís Banús



Figure 11. Gregorio Marañón in his library (image from the exhibition held in the Spanish National Library, 8 March-10 April 1988).

upon his release. “He believed he was under police surveillance [...], that his home was surrounded by a cordon of guards, whom he could hear whispering outside the door.” Compelled by hunger, he left the house; in the street, he interpreted the voice of a street seller “as the guards’ signal to attack.” The man was hit by a vehicle and admitted to the hospital’s observation ward. The patient attempted to drown himself in the fountain in the hospital’s courtyard. After six months, with no improvement observed in his delusion, he was sent to a state asylum with a diagnosis of presenile persecutory disorder.

The second patient was a 32-year-old married woman. Three years earlier, she had been completely blinded by an exploding oil lamp. She developed delusional jealousy “because her husband did not respect even her friends, who came to the house to seduce him, [...] although his favourite was her own sister.” Convinced that there was a real conspiracy to murder her, she attempted suicide by ingesting mercuric chloride. The patient was diagnosed with paranoid reaction.

With this article, Sanchís Banús aimed to raise the profile of psychiatry in his department, in line with Kraepelin’s nosological study on paranoid reactions.⁷⁹ A recent publication in the literature describes the case of a 42-year-old blind man with delusions about “electromagnetic waves from latest-generation mobile phones”: in other words, Sanchís Banús syndrome for the 21st century.⁸⁰

Marañón neck-big toe sign in meningitis (1926)

It is possible that infectious diseases may have been the first passion of the great endocrinologist, humanist, and writer Gregorio Marañón Posadillo (Madrid, 1887-1960). As a young man, after successfully competing for a position as a doctor on the staff of the Hospital General de Madrid, he had opted to join the infectious diseases department. Before his exile (1936-1942), he was briefly in charge of the Hospital de Infecciosos (later Hospital del Rey) (Figure 11).⁸¹ This experience probably gave rise to his interest in researching meningitis. The renowned scholar Gonzalo Moya recalls the sign being cited by the Polish neurologist Eufemiusz Herman.⁴⁶

Marañón twice described how to examine patients for the sign, as well as its clinical significance: first in 1926, in a communication to the Spanish Royal Academy of Medicine,⁸² and again in 1961, in his *Manual de*

Diagnóstico Etiológico, which was very popular among Spanish physicians in the 1960s.⁸³

What we may call the neck-big toe sign is explored as follows: with the meningitis patient lying down, the head is flexed sharply towards the chest. The examiner's other hand, resting on the patient's knees, is used to ensure that the legs do not bend, or in other words, that the Brudzinski sign is absent. It is then frequent to see the big toe extend, as in the Babinski sign.⁸²

By swiftly flexing the patient's head, and simultaneously using the other hand to prevent the knees from flexing, we can observe an extension of the big toe, with flexion of the other toes, as in the Babinski sign.⁸³

He adds a second clinical sign, which he suggests calling "abdominal flexion":

Sharp compression of the patient's abdomen causes a rapid flexion of the thigh over the abdomen. If only one side is compressed, the leg on that side flexes; in serious cases, however, both legs may flex.⁸²

"We are convinced that these signs present with similar frequency to the Brudzinski signs." "The three signs of Brudzinski," he stresses.

Marañón compared 12 patients with "all kinds of meningitis," with nuchal rigidity being absent in nine cases. The Kernig sign was present in ten cases, the Brudzinski sign in seven, the neck-big toe sign in six, and the "abdominal flexion" sign in seven. From a contemporary perspective, we would be justified in wondering about the seriousness of patients displaying the Babinski sign and the risk of blocking cerebral venous drainage with a violent manoeuvre to flex the neck. Neither would we recommend sharply compressing the abdomen to assess the "Marañón abdominal flexion sign", which may risk internal haemorrhage, particularly in patients with meningococcal meningitis. Marañón, with his typical sincere modesty, emphasises that "we do not intend to contribute new signs to the bitter tedium of exploratory manoeuvres. These are simply *two small tricks of the trade*."

And he was not mistaken. The Mexican authors Orrego Castellanos and Merlos Benítez include the signs described by Marañón in an excellent semiological paper describing 25 different signs.⁸⁴ Besides nuchal rigidity, the Kernig and Brudzinski signs continue to be a basic diagnostic feature: they have a specificity of 95%, although with considerably lower sensitivity.⁸⁵

Tolosa-Hunt syndrome (1954)

Eduardo Tolosa Colomer (Barcelona, 1900-1981; not to be confused with his son, Eduardo Tolosa Sarró) was one of the pioneers of neurosurgery in Spain (Figure 12 A). He first trained in clinical neurology at Lluís Barraquer Roviralta's electrotherapy and neurology clinic at the old Hospital de la Santa Creu in Barcelona, and later continued working with Barraquer-Ferré.⁸⁶ He also practised in Madrid, working with the neuropsychiatrist José Sanchís Banús (1890-1932) at the Hospital Provincial and with Gonzalo Rodríguez Lafora (1886-1971) in his laboratory at the Cajal Institute for biological research.⁸⁷ He trained in general surgery with Puig Sureda at the Hospital Clínic in Barcelona, but was initiated in neurosurgery in Paris, under Clovis Vincent (1879-1947).⁸⁸

In 1954, he published a short paper (barely three pages in length) entitled "Periarteritic lesions of the carotid siphon with the clinical features of a carotid infraclinoidal aneurysm" in the prestigious *Journal of Neurology, Neurosurgery and Psychiatry*.⁸⁹ The patient was a 47-year-old man who was admitted to the Neurological Institute [Tolosa omits the word "Municipal"], founded in Barcelona on 1 September 1936.⁹⁰ After experiencing pain in the left orbital region for three years, the pain became violent and continuous in the region of the first branch of the left trigeminal nerve, eventually progressing into total ophthalmoplegia. Instead of a carotid aneurysm, the expected cause, the cerebral angiography revealed a uniform narrowing of segment C2 of the carotid siphon. An exploratory craniotomy was carried out, with negative results; the patient died three days later. The post-mortem examination yielded unexpected results: the intracavernous portion of the carotid artery was wrapped in granulation tissue, which narrowed the artery without fully obstructing it (Figure 13). Both images show low-magnification images of the cavernous sinuses: the right sinus is normal, and the affected left sinus shows a thick cuff of pericarotid tissue.

The interest of this case is evidently in the neuropathological findings, although no name is given for the person who performed this study. Eduard Pons-Tortella (Mahón, 1906-Barcelona, 1989) had shown a fondness for anatomy since his student days, although he never succeeded in the state entrance examination system for university chairs at the time (Figure 12 B).⁹¹ He studied neuropathology under Ricardo Roca de Viñals

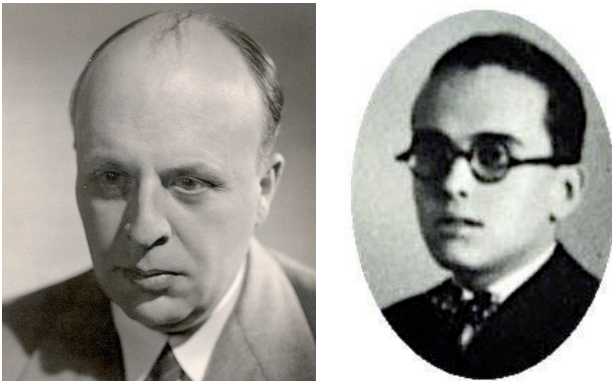


Figure 12. Eduardo Tolosa Colomer (A; RANM image archive) and the neuropathologist Eduardo Pons Tortella in his youth (B).



Figure 13. Illustrations from Tolosa's original report, depicting the uniform narrowing of the carotid siphon, and the granuloma wrapped around the carotid artery.⁸⁹

(1905-1959) at the Instituto Neurológico Municipal in Barcelona, replacing his mentor after he died. A bachelor from a wealthy family, in addition to working as a physician for the Barcelona municipal government, Pons-Tortella was able to dedicate his life to science, making several valuable contributions to embryology and neuropathology.⁹²

William Hunt (1921-1999), a neurosurgeon from Ohio, USA, endorsed the importance of Pons-Tortella's work in the understanding of (idiopathic) painful ophthalmoplegia in 1961. Writing in *Neurology*, he described the complete resolution of five of six cases following corticotherapy.⁹³ In the absence of pathological confirmation, Tolosa lent him four unpublished pathological illustrations of the original case, again without referring to the person who performed the study. The same year, Tolosa published another observation on spontaneously resolving painful ophthalmoplegia.⁹⁴

The eponym Tolosa-Hunt syndrome was proposed by the prestigious neuro-ophthalmologist Lawton Smith. He and D.S. Taxdal proposed the syndrome as a distinct clinical entity, differentiated by its progression, sometimes with spontaneous remission, and its responsiveness to steroids, and distinguished in all cases from diabetic ophthalmoplegia, painful ophthalmoplegia secondary to intracavernous aneurysms, and nasopharyngeal tumours.⁹⁵

Tolosa-Hunt syndrome is now considered to be a condition caused by non-specific inflammation in the region of the cavernous sinus and the superior orbital fissure, although diagnosis is essentially performed by exclusion.⁹⁶ Progression with relapses or favourable response to corticosteroids do not exclude the possibility of granulomatous tissue being associated with chronic *Actinomyces* infection.⁹⁷ There have also been suggestions of a possible link between Tolosa-Hunt syndrome and Eales disease, an inflammatory condition affecting the veins, predominantly in the eyes, which responds well to corticosteroids.⁹⁸

Conclusions

The characters

The biographies of the nine Spanish physicians whose research earned them eponyms in the neurology literature are testament to the high professional level they attained. We may begin with Gaspar Casal, whose renown in

Asturias led to the royal household laying claim to his services, or Santiago Ramón y Cajal, chair of various medical faculties and 1906 Nobel prizewinner. The other authors directed various specialist departments in the country's most prestigious hospitals: in Barcelona, at the architecturally beautiful Santa Creu hospital, Barraquer-Roviralta, honoured with two eponyms⁹⁹; and after the Civil War, Eduardo Tolosa Colomer, at the Instituto Neurológico Municipal⁹⁰; and in Madrid, the brilliant "Generation of Cajal" at the Colegio de Cirugía de San Carlos (Federico Olóriz, the unequalled instructor and talented anthropologist; Carlos María Cortezo, the great forward-thinking clinician and public health expert; Alejandro San Martín, the finest mind to have headed the faculty of the Colegio de Cirugía de San Carlos).¹⁰⁰ Four of the nine authors mentioned directed specialist departments in their field at the Hospital Provincial in Madrid (Marañón, Marín Amat, Sanchís Banús and Tapia).⁷⁵

Importance of Spanish eponyms in clinical neurology

There has been great variability in the importance of the contributions that merited inclusion in the "Areopagus of the Immortals", as José Casas Sánchez, the Madrid chair of general pathology, liked to say. This is true, at least, if they are judged based on the frequency of citations. The most noteworthy are Lafora disease and Tolosa-Hunt syndrome, followed at a distance by Marín Amat synkinesis.

Lafora disease, the discovery of a new clinico-pathological entity, is in all likelihood the Spanish eponym which has carried the most weight in clinical neurology. It is true that Bernard Glueck, presumably an inexperienced young man of 27 years of age, and destined to become a forensic psychiatrist,⁵³ left gaps and committed clear errors in his clinical description; however, he did note the essential details, such as onset during adolescence, association with convulsive seizures, and the prominence of multifocal myoclonus, with all of these symptoms progressing gradually. However, it was Gonzalo Lafora, no older than Glueck, who skilfully applied the histopathological techniques he learned from Cajal and Simarro,⁴⁶ unequivocally identifying the corpora amylacea, their staining characteristics, and their unusual distribution in the central nervous system, thereby defining the disease that now bears his name. All that remained to be demonstrated were the electroencephalographical features⁵⁵ and the causal genes.⁶⁰

The cephalothoracic lipodystrophy described by Barraquer-Roviralta has also been confirmed as a definite entity since Barraquer's original description. At the time, the neurologist was receiving numerous patients with metabolic processes such as Basedow disease and various osteoarticular disorders (Barraquer imagined a sympathetic neuropathy, and his son considered a hereditary degeneration of the hypothalamus).³⁰ The same was happening outside of Spain. Both Pierre Marie and Bekhterev had become interested in *spondylose rhizomélique*,^{101,102} not to mention acromegaly and cleidocranial dysostosis, subjects beloved of Pierre Marie.

Besides Lafora disease, Tolosa-Hunt syndrome is the most cited Spanish eponym.⁸⁹ Tolosa's ingenuity at the time, signalling that this form of painful ophthalmoplegia (an alternative term to Tolosa-Hunt syndrome) is not always caused by a saccular aneurysm in the carotid siphon, is undeniable. Evidently, there are a number of other pathologies that can cause the disease. The issue today is whether steroid treatment should be started once aneurysms, tumours, and diabetes are ruled out, and whether this may mask or exacerbate indolent infectious processes in the region of the carotid sinus.^{97,98}

It seems unfair to reduce the admirable figure of Gaspar Casal to no more than the author of the description of pellagra or "mal de la rosa", however masterly his work on the disease may have been.¹¹ After glancing through his *Historia natural y médica de el Principado de Asturias* (1762), one is left with the sensation that there are far more "hidden neurological gems" to be found from the best medical text of 18th-century Spain. Hopefully, this promising area of study will be explored soon.

Four of the eponyms, Tapia (1905), Marín Amat (1919), Barraquer-Roviralta (1921), to whom two syndromes are attributed, and Sanchís Banús (1924), are exemplary for the quality of their work in localisation or semiology. All of them stand out for their discernment, for their awareness of the value of what they held, small though it may have been, and its promise to reward their efforts.

We would be justified in noting that García Tapia's case was extremely unlikely, but not impossible: a) the bull's horn passed along the edge of the right horizontal ramus of the mandible; b) the presence of lesions to the ninth and tenth cranial nerves, associated with paralysis of the ipsilateral vocal cords, but with soft palate mobility remaining intact, representing an advance in

the renowned otorhinolaryngologist's understanding of anatomy; c) association with deferred onset of hemiparesis with respect to the accident, most probably due to contusion of the carotid artery. However, it would appear unjust to disqualify Tapia syndrome²⁴ on account of the author's other work and other cases published subsequently.^{21,22} Fair play must be our first consideration.

Frankly, there is little relation between Marcus Gunn phenomenon and the condition described by the Spanish ophthalmologist Marín Amat.⁶³ This can be seen through simple reflection on the natural history of each condition, despite which certain authors have insisted on referring to as "inverse Marcus Gunn syndrome". Rather, the electromyographic data on the ocular muscles in each case suggest differing pathophysiologies.^{67,68} We have considered an association with crocodile tears syndrome in the original patient; this had not previously been mentioned and without a doubt further complicates the syndrome.

It is this author's impression that few neurologists examine the plantar grasp response to "gentle, insistent" stimulation of the sole of the foot⁷¹ as an expression of a lesion in the frontal premotor area. The sensibility and specificity of the sign, the effect of age (children vs elderly patients), the underlying pathology (cerebral palsy vs Alzheimer disease), and how it compares with the palmar grasp reflex all remain to be seen. In any case, it would seem a glaring oversight to identify the sign with focal action dystonia of the foot.⁷²

Ophthalmologists and psychiatrists should perhaps be alert to potential paranoid delusions in blind patients; in both of Sanchís Banús' patients, these were accompanied by suicide attempts.⁷⁷ As regards the new signs in meningitis examination, Marañón himself admitted that there may already have been too many.⁸⁴ Effectively, his are obsolete (and it is reasonable to wonder whether his manoeuvres may have involved some risk to the patient). With respect to the interstitial nucleus of Cajal and its link to supranuclear motility and disorders, the complexity of the surrounding anatomical structures and their small dimensions have to date represented challenges for drawing any definitive clinico-pathological conclusion. Modern neuroimaging systems may hold promise for future research, however.³⁹

The importance of an era

It is worth considering the possible influence of the language of publication and subsequent dissemination of the original observations of the eponyms. It is no coincidence that the language of publication was French on seven occasions (Cajal, Tapia, Marín Amat, and Barraquer-Roviralta in 1921), German on three (two articles by Lafora 1911 and one by Barraquer-Roviralta) and English on one (Tolosa, in the 1950s). We should note Cajal's bitterness as he showed Penfield his work, unacknowledged for being published in Spanish.¹⁰²

The majority of the eponyms are purely clinical observations, made when new semiological details could still be discovered in patients examined in hospital wards or at consultation. In the work of Tapia and Marín Amat, we can see incredibly precise anatomical knowledge. Neither should it be a surprise that none of the authors cited, save Barraquer-Roviralta, Lafora, and Sanchís Banús, were neurologists: Spanish neurology was still some years away from truly taking shape.

It can be no coincidence that eight of the ten articles that originated eponyms were published between 1906 and 1926, a period of resurgence for Spanish medicine. On 23 April 1903, the 19th International Congress of Medicine was held in Madrid. Ivan Pavlov (1849-1931) presented his observations on conditioned responses for the first time at the Great Hall of the Faculty of Medicine. In the front row was Cajal, no doubt pleased to be witnessing the start of a new era for Spanish medicine.¹⁰³

Acknowledgements

We are grateful to Vanessa Cisteré of the SEN's Museo Archivo Histórico and to María José Rebollo of the Official College of Physicians of Madrid for their help with the bibliography.

Conflict of interest

The author has no conflicts of interest to declare.

References

1. Orly R, Haines DE. Neurowords: "Matthew effect" in neurosciences. *J Hist Neurosci.* 2012;21:115-8.
2. Schutta HS. The trouble with eponyms. *Arch Neurol.* 2005;62:1784-5.
3. Kondziella D. Thirty neurological eponyms associated with the Nazi Era. *Eur Neuro.* 2009;62:56-4.

4. Toodaya N. A convenient "inconvenience": The eponymous legacy of Sir William Richard Gowers (1845-1915). *J Hist Neurosci*. 2017;26:50-82.
5. Woywodt A, Matteson E. Should eponyms be abandoned? *BMJ*. 2007;35:424.
6. Koehler P, Bruyn GW, Pearce JMS. *Neurological Eponyms*. Oxford: Oxford University Press; 2000.
7. Duque-Parra J, Llano-Idárraga JO, Duque-Parra CA. Reflections on eponyms in neuroscience terminology. *Anat Rec B New Anat*. 2006;289:219-24.
8. Goic AG. Sobre el uso de epónimos en medicina. *Rev Med Chile*. 2009;137:1508-10.
9. Ezpeleta D. Virtudes e inconvenientes de los epónimos médicos: 400 epónimos en Neurología. Barcelona: Ed. ESMONpharma; 2004.
10. Marañón G. Los amigos del padre Feijoo. In: *Obras Completas: Ensayos*, vol. IX. Madrid: Espasa-Calpe; 1973. p.139-51.
11. Casal G. Historia natural, y médica de el Principado de Asturias. Madrid: Oficina de Manuel Martín; 1762.
12. García-Albea E. La neurología española durante la Ilustración. La obra de Gaspar Casal. *Rev Neurol*. 2000;30:495-7.
13. López Piñero JM. Gaspar Casal: descripción ecológica de la palabra, primera enfermedad carencial. *Rev Esp Salud Publica*. 2006;80:411-5. [Buck C, Llopis A, Nájera E, Terris M. The Challenge of Epidemiology: Issues and Selected Readings. Washington: Pan American Health Organization; 1988.]
14. Balcells M. Historia de las enfermedades carenciales del sistema nervioso. *Neurosci Hist*. 2014;2:156-69.
15. Kapoor R, Saint S, Kapoor JR, Johnson RA, Dhaliwal G. Clinical problem-solving. D is for delay. *New Eng J Med*. 2014;371:2218-23.
16. Huertas R. Hambre, enfermedad y locura: La aportación de Bartolomé Llopis al conocimiento de la psicosis pelagrosa. *Frenia*. 2006;6:79-107.
17. Bruyn GW, Poser CM. *The history of tropical neurology: nutritional disorders*. Canton: Science History Publications; 2003.
18. Marañón G. Antonio García Tapia. In: *Obras Completas. Idearium*, tomo X. Madrid: Espasa-Calpe; 1977. p.285-6.
19. Tapia AG. Un caso de parálisis del lado derecho de la laringe y de la lengua, con parálisis del esternocleidomastoideo y trapecio del mismo lado; acompañado de hemiplejía total temporal del lado izquierdo del cuerpo. *El Siglo Médico*. 1905;52:211-3.
20. Tapia AG. Un cas d'hémiplégie droite du larynx et de la langue avec paralysie du sterno-cléido-mastoiïdien et du trapèze de même côte, suivie d'hémiplégie totale passagère du côté gauche du corps. *Presse Otolaryngol Belge*. 1905;4:58-65.
21. Tapia AG. Un síndrome nuevo: Varios casos de hemiparálisis de la laringe y de la lengua, acompañados ó no de parálisis del esterno-cleido-mastoideo y trapecio. *Bol Laringol Otol Rinol*. 1906;6:33-40.
22. Tapia AG. Un nouveau syndrome: Quelques cas d'hémiplégie du larynx et de la langue: avec o san paralysie du sterno-cléido-mastoiïdien et du trapèze. *Arch Int Laryngol* 1906;22:780-5.
23. Pérez Peña F. Los últimos clínicos de San Carlos. Estampas y vivencias de la Facultad de Medicina de San Carlos. Madrid: Editorial Visión Libros; 2005.
24. Schoenberg BS, Massey EW. Tapia's syndrome. The erratic evolution of an eponym. *Arch Neurol*. 1979;36:257-60.
25. Guardiola E, Baños JE, Lluís Barraquer i Roviralta. La lipodistrofia progressiva de Barraquer-Simons. En: *Eponimia mèdica catalana. Cuadernos de la fundación Dr. Antoni Esteve nº 1*. Barcelona: Fundació Dr. Antoni Esteve; 2004.
26. Zarranz JJ. Luis Barraquer Roviralta. *Neurosci Hist*. 2014;2:34-7.
27. Pedro-Pons A. El Dr. Barraquer-Roviralta en el ambiente médico barcelonés. *Med Clin (Barc)*. 1950;15:291-2.
28. Barraquer Roviralta L. Historia clínica de un caso de atrofia del tejido céluloadiposo. Barcelona: L'Avençs; 1906.
29. Barraquer Roviralta L. Histoire clinique d'un cas d'atrophie du tissu célula-adipeux. *Neurol Zenbralb*. 1907;16:1072.
30. Barraquer Ferré L. Patogenia de la lipodistrofia progresiva (Enfermedad de Barraquer). In: *Estudios de Neurología Clínica*. Barcelona: José Janés, ed.; 1952. p.681-90.
31. Marañón G. Un caso de lipodistrofia progresiva con curiosas alteraciones endocrinas. *Arch Neurobiol*. 1920;3:290-5.
32. Mezquita López J. Consideraciones sobre un caso de síndrome de Barraquer-Simons. Referencia a su patogenia. *Rev Clin Esp*. 1945;19:336-9.
33. Oliveira J, Freitas P, Lau E, Carvalho D. Barraquer-Simons syndrome: a rare form of acquired lipodystrophy. *BMC Research Notes*. 2016;9:175-9.
34. De Lucas Collantes C, Pozo-Román J, Aparicio-López C, De Prada-Vicente I, Argente J. Lipodistrofia parcial adquirida (síndrome de Barraquer-Simons) y nefropatía IgA. *Nefrología*. 2016;36:556-8.
35. Fuentes Jiménez F, De la Torre Cisneros J, Pérez Jiménez F. Lipodistrofias. *Med Clin (Barc)*. 2002;119:390-5.
36. Holdorff B. Arthur Simons (1877-1942) and tonic neck reflexes with hemiplegic "Mitbewegungen" (associated reactions): Cinematography from 1916-1919. *J Hist Neurosci*. 2016;25:63-71.
37. Brodal A. *Neurological anatomy in relation to clinical medicine*, 3rd ed. New York: Oxford University Press; 1981. p.209.
38. Rubio-Pérez MA, Gálvez-Ruiz AL, Sepúlveda-Gázquez M, Planellas-Giné LL, Roquer-González J. Revisión del modelo

- del control de la mirada vertical. *Rev Neurol*. 2011;53:477-82.
39. Kremmyda O, Büttner-Ennever JA, Büttner U, Glasauer S. Torsional deviation with voluntary saccades caused by a unilateral midbrain lesion. *J Neurol Neurosurg Psychiatr*. 2007;78:1155-7.
 40. Tello JF. Cajal y su labor histológica. Madrid: Universidad Central (cátedra de Valdecilla); 1935.
 41. Ramón y Cajal S. *Histologie du système nerveux de l'homme et des vertébrés*. Paris: Maloine; 1909-1911.
 42. Ramón y Cajal S. *Histología del sistema nervioso del hombre y de los vertebrados*. Madrid: Ed. Boletín Oficial del Estado; 2007.
 43. Pierrot-Deseilligny CH, Chain F, Gray F, Serdaru M, Escourolle R, Lhermitte F. Parinaud's syndrome: electro-oculographic and anatomical analyses of six vascular cases with deductions about vertical gaze organization in the premotor structures. *Brain*. 1982;105:667-96.
 44. Haines DE. *Neuroanatomy. An atlas of structures, sections, and systems*. Baltimore-Munich: Urban & Schwarsenberg; 1987.
 45. Bogousslavsky J, Miklossy J, Regli F, Janzer R. Vertical gaze palsy and selective unilateral infarction of the rostral interstitial nucleus of the medial longitudinal fasciculus (riMLF). *J Neurol Neurosurg Psychiatr*. 1990;53:67-71.
 46. Moya G, Gonzalo R. Lafora. *Medicina y cultura en una España en crisis*. Cantoblanco, Madrid: Ediciones de la Universidad Autónoma de Madrid; 1976.
 47. Valenciano Gayá L. *El doctor Lafora y su época*. Madrid: Ediciones Morata, S.A; 1977.
 48. Balcells M. Gonzalo Rodríguez Lafora (1886-1971). *Neurosci Hist*. 2014;2:176-80.
 49. De Castro F. De la obra científica histopatológica de Nicolás Achúcarro. *Hospital General*. 1962;2:441-56.
 50. García Albea E, Pérez Trullen JM. The Spanish School of Neurology and the first American case of Alzheimer's disease. *J Hist Neurosci*. 2003;12:437-45.
 51. Rodríguez Lafora G, Glueck B. Beitrag zur Histopathologie der myoklonischen Epilepsie. *Zietchsrift Gesamte Neurologische Psychiatrie*. 1911;6:1-14.
 52. Lebensohn ZM. In memoriam: Bernard Glueck, Sr. 1884-1972. *Am J Psychiatr*. 1973;130:326.
 53. Roger J, Pellissier JF, Bureau M, Dravet C, Revol M, Tinuper P. Le diagnostic précoce de la maladie de Lafora. Importance des manifestations paroxystiques visuelles et intérêt de la biopsie cutanée. *Rev Neurol*. 1983;139:115-24.
 54. Rodríguez Lafora G. Über das Vorkommen amyloider Körperchen im Innern der Ganglienzellen; zugleich ein Beitrag zum Studium der amyloiden Substanz in Nervensystem. *Virchows Arch Pathol Anat Physiol Klin Med*. 1911;205:205-9.
 55. Van Heycoptenhamp, De Jager H. Progressive myoclonus epilepsy with Lafora bodies. Clinical-pathological features. *Epilepsia*. 1963;4:95-119.
 56. Schwarz GA, Yanoff M. Lafora's disease. Distinct clinico-pathologic form of Unverricht's syndrome. *Arch Neurol*. 1965;12:172-88.
 57. Rodríguez Lafora G. Nuevas investigaciones sobre los cuerpos amiláceos del interior de las células nerviosas. *Trab Lab Invest Biol Univ Madrid*. 1913;9:29-42.
 58. Rodríguez Lafora G. Las mioclonías y los cuerpos amiláceos en las células nerviosas (Prioridad de su descubrimiento). *Arch Neurobiol*. 1924;4:321-38.
 59. Shahwan A, Farrell M, Delanty N. Progressive myoclonic epilepsies: a review of genetic and therapeutic aspects. *Lancet Neurol*. 2005;4:239-48.
 60. Genton P. La maladie de Lafora (EPM2A). *Rev Neurol (Paris)*. 2007;163:47-53.
 61. Nanduri AS, Kaushal N, Clusmann H, Binder DK. The maestro don Gonzalo Rodríguez-Lafora. *Epilepsia*. 2008;49:943-7.
 62. Marin-Amat M. Tracoma y sus complicaciones. Madrid: Editorial Saturnino Calleja; 1923.
 63. Marin Amat M. Sur le syndrome ou phénomène de Marcus Gunn. *Ann d'Ocul*. 1919;46:514-28.
 64. Kannaditharayil D, Geyer H, Hasson H, Herskovitz S. Bilateral Marcus Gunn jaw-winking syndrome. *Neurology*. 2015;84:1051.
 65. Rana PV, Wadia RS. The Marin-Amat syndrome: an unusual facial synkenesia. *J Neurol Neurosurg Psychiatry*. 1985;48:939-41.
 66. García Ron A, Jensen J, Garriga Braun C, Gómez E, Sierra J. Síndrome de Marín-Amat y Marcus-Gunn invertido. Presentación de 2 casos de sincinesia facial. *An Pediatr (Barc)*. 2011;74:324-6.
 67. Lubkin V. The inverse Marcus Gunn phenomenon. An electromyographie contribution. *Arch Neurol*. 1978;35:249.
 68. Oh JY, Kim JE, Kim YJ, Park KD, Choi KG. A case of familial inverse Marcus Gunn phenomenon. *J Neurol Neurosurg Psychiatry*. 2003;74:278.
 69. Ben Rayana N, Ben Hadj Hamida F, Touzani F, Chahed N, Knani L, Krifa F et al. Les syncinésies oculo-facio-palpébrales associées au ptosis: aspects épidémiologiques, cliniques et thérapeutiques. *J Fr Ophthalmol*. 2011;34:95-107.
 70. Boroojerdi B, Ferbert A, Schwarz M, Herath H, Noth J. Botulinum toxin treatment of synkinesia and hyperlacrimation after facial palsy. *J Neurol Neurosurg Psychiatry*. 1998;65:111-4.
 71. Barraquer Roviralta L. Contribution à l'étude du réflexe plantaire pathologique. *Rev Neurol (Paris)*. 1921;5:455.
 72. Futagi Y, Suzuki V, Goto M. Clinical significance of plantar grasp response in infants. *Pediatr Neurol*. 1999;20:111-5.
 73. Manfredi M, Sacco G, Sideri G. The tonic ambulatory foot

- response. A clinical and electromyographic study. *Brain*. 1975;98:167-80.
74. Boisson D, Confavreux C, Eyssette M, Aimard G, Devic M. Isolated tonic ambulatory flexion of the foot. *Rev Neurol (Paris)*. 1981;137:807-15.
 75. Giménez-Roldán S. The Madrid school of neurology. *Rev Neurol (Paris)*. 2015;171:5-15.
 76. Marañón G. Medio siglo de psiquiatría. In: *Obras completas, Discursos*, vol. 2. Madrid: Espasa-Calpe, S.A.; 1971. p.291-6.
 77. Sanchís Banús J. Las reacciones paranoides de los ciegos. *Arch Med Cir Esp*. 1924;15:87-93.
 78. Bumke O. *Handbuch der Geisteskrankheiten*, 2nd ed. Munich: Springer; 1924. p.13.
 79. Pérez Salmón C. El síndrome de Sanchís Banús. Una contribución española a la nosografía psiquiátrica del siglo XX. *Rev Hist Psicol*. 2002;23:207-312.
 80. Carrión-Expósito L, Bancalero-Romero C, Hans-Chacón A, González-Moreno JM, Baena-Baldomero A, Ruiz-Doblado S. Delirio paranoide de los ciegos (síndrome de Sanchís-Banús). *Psiquiatr Biol*. 2012;19:95-8.
 81. Laín Entralgo P. Introducción. En: Marañón G. *Obras completas*, Vol. 1. Madrid: Espasa Calpe, S.A.; 1975.
 82. Marañón G: Sobre el diagnóstico general de la meningitis. *Anales de la Academia Nacional de Medicina*. 1926;46:513-6.
 83. Marañón G. *Manual del diagnóstico etiológico*. Madrid: Espasa Calpe, S.A.; 1961.
 84. Orrego-Castellanos H, Merlos Benítez M. Meningitis bacteriana aguda. Mitos y realidades de una urgencia neurológica. *El Residente*. 2009;4:41-6.
 85. Thomas KE, Hasbun R, Jekel J, Quagliarello VJ. The diagnostic accuracy of Kernig's sign, Brudzinski's sign, and nuchal rigidity in adults with suspected meningitis. *Clin Infect Dis*. 2002;35:46-52.
 86. Tolosa E. Primeros pasos de la Neurocirugía en el antiguo hospital de la Santa Cruz bajo el impulso de Luis Barraquer Roviralta. *Med Clin (Barc)*. 1950;15:383-5.
 87. Guardiola E, Baños JE. Eduard Tolosa y Colomer. La síndrome de Tolosa-Hunt. In: *Eponimia mèdica catalana*. Cuadernos de la fundación Dr. Antoni Esteve nº 1. Barcelona: Fundació Dr. Antoni Esteve; 2004. p.87-9.
 88. Guiot G. Clovis Vincent (1879-1947). *Surg Neurol*. 1973;1:189-90.
 89. Tolosa E. Periarteritic lesions of the carotid siphon with clinical features of a carotid infraclinoidal aneurysm. *J Neurol Neurosurg Psychiatry*. 1954;17:300-2.
 90. Rodríguez Arias B. La pequeña crónica, en glosa, de un hospital barcelonés: el Instituto Neurológico Municipal. *Anales de Medicina y Cirugía*, 1969;49:417-26.
 91. Mari i Balcells VJ. L'obra d'Eduard Pons i Tortella (Maó, 1906- Barcelona, 1989). *Gimbernat*. 1995;24:185-98.
 92. Solé-Llenas J. La obra científica de Eduardo Pons Tortella. Su aportación a la neuroanatomía y neuropatología. Barcelona: [s.n.]; 2001.
 93. Hunt WE, Meagher JN, LeFever HE, Zeman W. Painful ophthalmoplegia. Its relation to indolent inflammation of the cavernous sinus. *Neurology*. 1961;11:56-62.
 94. Tolosa E, Fuenmayor P, Llovet J. Syndrome du sinus caverneux. Considerations sur les formes bénignes et spontanément régressives. *Rev Otonéuroophthalmol*. 1961;33:361-8.
 95. Smith JL, Taxdal DS. Painful ophthalmoplegia. The Tolosa-Hunt syndrome. *Am J Ophthalmol*. 1966;61:1466-72.
 96. Kline LB, Hoyt WF. The Tolosa-Hunt syndrome. *J Neurol Neurosurg Psychiatry*. 2001;71:577-82.
 97. Mandrioli J, Frank G, Sola P, Leone ME, Guaraldi G, Guaraldi P, et al. Tolosa-Hunt syndrome due to actinomycosis of the cavernous sinus: the infectious hypothesis revisited. *Headache*. 2004;44:806-11.
 98. Mendonça MD, Guedes M, Matias G, Costa J, Viana-Baptista M. Steroid-responsive painful ophthalmoplegia: Tolosa-Hunt syndrome, Eales disease, or both?. *Cephalalgia*. 2017;37:191-4.
 99. Arboix A, Martí-Vilalta JL. The neurological studies of Dr. Robert (1842-1902), mentor to Barraquer Roviralta. *Neurosci Hist*. 2014;2:106-11.
 100. Cohen H. Pierre Marie 1853-1940. *Proc Soc Med*. 1953;46:1047-54.
 101. Kesselring J. Vladimir Mikhailovic Bekhterev (1857-1927): strange circumstances surrounding the death of the great Russian neurologist. *Eur Neurol*. 2011;66:14-17.
 102. Penfield W. No man alone: a neurosurgeon's life. Boston/Toronto: Little, Brown and Company; 1977.
 103. García-Albea E. Su majestad el cerebro. Historia, enigmas y misterios de un órgano prodigioso. Madrid: La Esfera de los Libros; 2017.