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## History of Neurology

# The tic douloureux of Alexis Pujol (1739–1804)

O. Walusinski

Lauréat de l'Académie de Médecine, 20, rue de Chartres, 28160 Brou, France

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### ABSTRACT

In 1787, Alexis Pujol (1739–1804) wrote the first monograph exclusively on trigeminal neuralgia which he called “tic douloureux”, or painful tic. Although it was not a seminal description, his monograph was a valuable clinical summary that helped his contemporaries make an exact diagnosis, even though it did not offer proven treatments. Unlike most in his day, Pujol adhered to the theory of electricity, seeing it as the vector of information transmission by the nerve. This made him a precursor and put him in a position to propose a novel pathophysiological theory of pain, not yet qualified as neuralgic. His thinking illustrates that, at the dawn of the nineteenth century, a provincial physician working alone was able to make his contribution to building medical knowledge, particularly in the field of neurology. After a brief biography of Pujol, this article will cite from his book to show the relevance of his clinical observations, which are still valuable today. Without omitting the inspiration, he took from his predecessors, this article also mentions the work of those who followed in his footsteps.

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“Those who have not really suffered are unaware of how good the tolerable can feel” Jean Rostand (1894–1977) [1].

Since time immemorial, the ability to provide relief to a patient suffering from intolerable pain remains, for the physician, one of the most profound gratifications. Renal colic, migraines, attacks of gout, and dental abscesses are among the most trying experiences, but the intensity of the pain they cause may still not surpass the torments of trigeminal neuralgia. In 1787, a physician in Castres in southern France named Alexis Pujol (1739–1804) offered his fellow physicians the first monograph exclusively on what he called “tic douloureux” (painful tic) and its treatment [2].

## Who was Alexis Pujol?

The son of a lawyer in Toulouse, Alexis Pujol was born on 10 October 1739 in Le Poujol-sur-Orb, not far from Béziers in

southern France. After abandoning his initial plan to become a priest, he studied medicine in Toulouse where he received his “doctor’s hat”, meaning his doctorate, on 23 June 1762 [3]. He then left to perfect his skills under the famous masters at the University of Montpellier. Practising initially in Bédarieux, west of Montpellier, he moved to Castres at the request of a prelate he had previously treated. He was to remain there all his life. Having competed for various prizes sponsored by local and Parisian learned societies, he decided in 1787 to send a short work “on the diseases of the face” to the Royal Society of Medicine; his book on tic douloureux was the commercial edition. In 1802, he undertook to compile all his writings, notably the prize-winning works, which were published in Castres in three volumes entitled *Ouvres de médecine pratique* (works of practical medicine), expanded and republished in four volumes in 1823 in Paris [4]. His biographer, François-Gabriel Boisseau (1791–1836), asserts that we must forgive Pujol for opposing “the salutary practice of vaccination”, a procedure too

E-mail address: [walusinski@baillement.com](mailto:walusinski@baillement.com).

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novel for Pujol to adopt right away. Boisseau points out that Pujol's *Essai sur les inflammations chroniques* (essay on chronic inflammation) was one of the sources of inspiration of François-Joseph-Victor Broussais (1772–1838) for his *Histoire des Phlegmasies ou inflammations chroniques* (history of phlegmasia or chronic inflammation) [5].

Boisseau did not fail to note that upon Pujol's death on 15 September 1804, "his renown dissipated, he descended unknown into his grave, and his name was forgotten". He had spent his entire career in the provinces; the city of Castres was a long way from Paris.

### Description of tic douloureux

Confronted with several cases of "tic douloureux.. this singular affection", Pujol searched in vain for works that could familiarise him with this pathology and its possible treatments. "I finally undertook to compile my own observations." From the beginning of his work, published in 1787 (Fig. 1), Pujol took into account recent advances in the physiology of nerves. Nerves were thought to carry "the electric fluid", which had come to replace "the animal spirits". Abbot Jean-Antoine Nollet (1700–1770) had presented these ideas to the French Academy of Sciences in 1764 [6], not long after the Swiss physiologist Albrecht von Haller (1708–1777) [7].

Right away in the introduction, Pujol gauged the severity of this illness: "No other disease makes those attacked by it experience more violent torment, and no other disease resists with more tenacity the various means devised to fight it". Beside the nose and under the cheekbone, always in the same place, there were "momentary jolts... of sharp pain that [shot] out in a bizarre & cruel manner to some of the nearby places, most often accompanied by convulsive movements in the surrounding muscles". The location of this pain was "where a main branch of the upper maxillary nerve comes out of the infraorbital foramen". Highly variable in duration, the attacks were repetitive; "some patients have only a quarter-hour at a time where they are entirely without pain". Pujol described the irradiations, particularly to the teeth, the eyes, and the forehead. He underscored the behaviour of patients throughout their attack, how they did not dare move their jaw or cry out, for fear that this would worsen their condition, akin to "an ecstatic state describing better than any words the force of their pain.

Observing that in many cases, this cruelly painful tic was not accompanied by any muscular contraction in the face, Pujol criticised François Boissier de La Croix de Sauvages (1706–1767) of Montpellier [8] and the Scottish William Cullen (1710–1790) [9] "for having classified this disease with the convulsive affections (*Trismus doloricus*, class *Morbi convulsivi seu convulsiones*)" in their voluminous nosologies. Pujol did not fail to note that certain patients perceive "preliminary & inexpressible sensations in the affected area shortly before the painful insult". However, contrary to motor or phonic tics, this premonitory perception of neuralgia did not make it possible block the wave of pain, as Pujol noted. Chewing or speaking could trigger an attack, leading some patients to go on dangerous fasts. Pujol underscored the fixity of the pain and its constant unilaterality in a given patient. He wrote that he had diagnosed neuralgia in all ages, notably among children. He

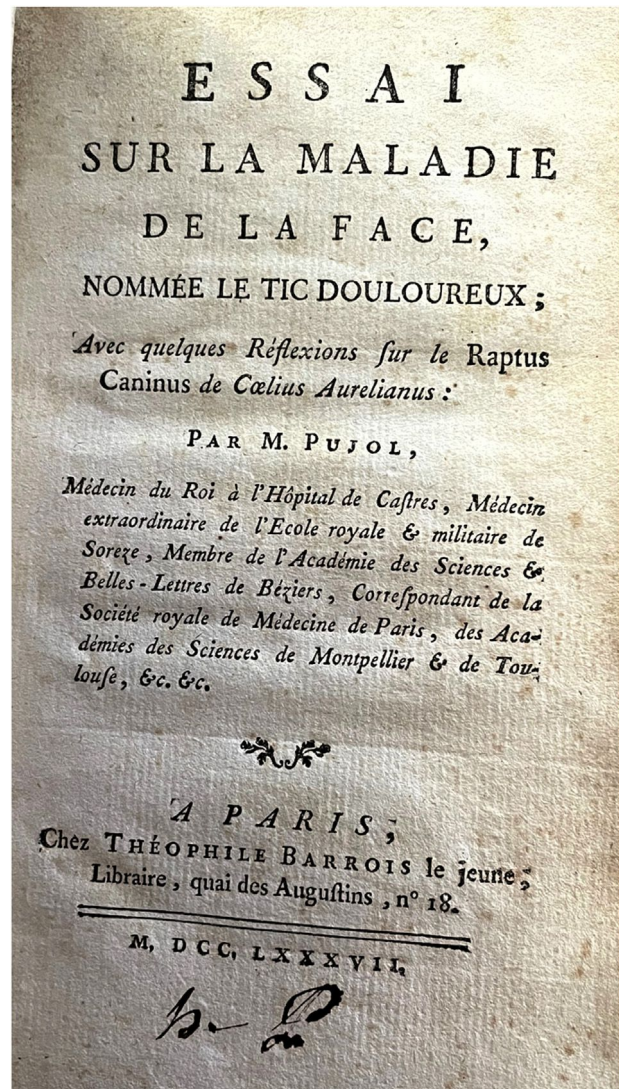


Figure 1 – Work written by Alexis Pujol in 1787 (Collection OW).

also noted a higher incidence among women and that cases after the age of forty were rare, undoubtedly due to the shorter life expectancy in the eighteenth century.

For Pujol, the differential diagnoses were "clavus hystericus", purulent sinusitis, and odontalgia frequently leading to multiple tooth extractions, of no use in cases of tic douloureux. Pujol found that, in the past, too many physicians had confused this tic douloureux with "involuntary laughter divided into two main types, paralytic laughter & convulsive laughter"; that is, facial palsy and dystonia, the distinctive criteria of which are permanence and near indolence.

### Pathophysiological explanation of tic douloureux

Pujol then discussed "the theory of tic douloureux". He saw a similarity with cramps, notably the horrible cramping in

cholera, and borrowed an expression coined by the Scottish Duncan Liddel (1561–1613): “An illegitimate, bastard kind of convulsion” [10]. Pujol believed in the existence of cramps without muscular contraction. For him, the intensity of the pain and the fact that the face has numerous muscles validated the link he saw between *tic douloureux* and cramps. He noted regretfully, “As the organisation of the muscle fibre is a mystery of nature that eludes all our researches, & as we are perfectly unaware of the manner in which the animal spirit, carried by nerve fibres, reaches the muscle fibres and distributes itself to them in order to activate sensitivity & mobility, it is impossible to indicate here, even conjecturally, the near & immediate cause that produces in the muscles this kind of painful erethism”. However, Pujol hypothesised that only a “local, fixed & permanent cause that, by its assiduous action, holds some nervous branch in a state of erethism” was capable of producing this sort of pain. Hence his prescient conclusion that a factor acted on the nerve to disturb its functioning. He referred to this factor as “*proca-thartic*”.

Pujol was familiar with the experiments of Abbot Pierre Nicolas Bertholon (1742–1800), in which he rubbed two nerves together to produce light, indicating an electric presence within them [11]. He considered these experiments to be decisive in confirming that “life, feeling & movement [were] purely electrical phenomena”. The brain, where all nerves originated, was “the reservoir of electro-animal fluid”. Likewise, “the absolute abolition of this positive electricity, characteristic of animals, [was] nothing other than death; & its excessive intensity [was] related to all painful & spasmodic diseases”. Pujol applied his theory to *tic douloureux*: “Excited by local causes, superabundant electro-animal fluid habitually flows to a specific location. In this case, all the other parts will be spared, & a spasmodic disease will form in a select place, its fixity and constant tenacity being what protects the rest of the body from it”. For him, the muscular contraction obtained by electrical stimulation of a nerve in a paralysed limb was counter-evidence validating his theory, “the happy application of medical electricity that we are able to make in our times”.

We know now that Pujol was wrong when he rejected that “a mechanical cause of irritation, such as pressure on this nerve by some lymphatic or osseous tumour” was the factor triggering the pain. Vascular compression of the dorsal root of the trigeminal nerve by an aberrant loop of blood vessels is currently accepted as the most common cause of trigeminal neuralgia. The offending vessel is most commonly the superior cerebellar artery or the anterior inferior cerebellar artery. In addition, a vein contributes to the compression and sometimes is the only compressing vessel. Because of the lamination pattern of fibres within the nerve root, medial compression tends to cause maxillary nerve (V2) symptoms, lateral or caudal compression may cause mandibular nerve (V3) symptoms, and rarely cranial compression will cause ophthalmic nerve (V1) symptoms (Fig. 2) [12]. In some cases, it is also suggested that entrapment of the maxillary and mandibular nerves when they cross the ovale and rotundum foramina may be the primary cause of the neuralgia [13].

For Pujol, only “a sickly and acrimonious humour fixed in the same place as the pain” was the cause of this pathology. He referred to gout and scurvy as “humours”. Only powerful treatments for these humours, initiated from the start of the

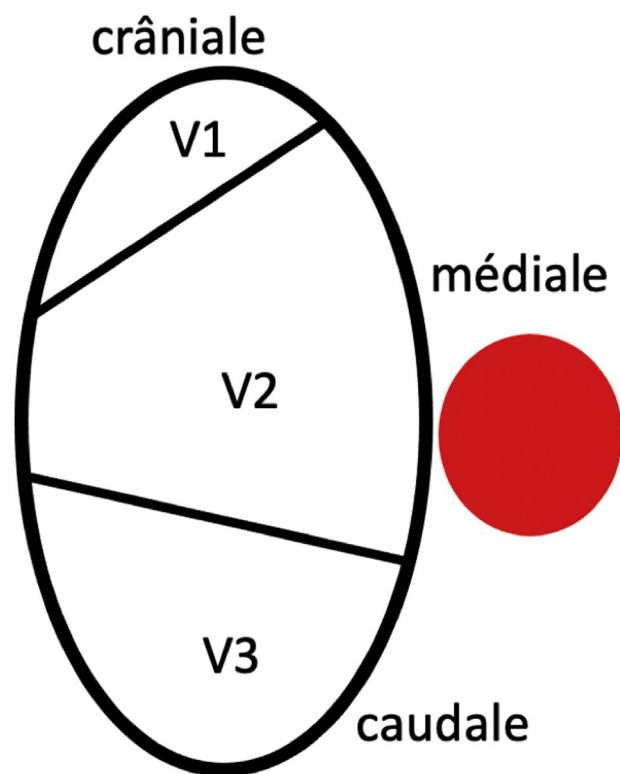


Figure 2 – Schematic diagram of the artery/nerve conflict based on Yoshino et al. [12].

pain, could prevent them from setting in permanently, with “an absolutely incurable outcome”.

### Similarity between *raptus caninus* and *tic douloureux*

Johann Conrad Amman (1669–1724), a Dutch physician originally from Schaffhausen in Switzerland, compiled in 1722 the writings of de Cælius Aurelianus, a Roman physician living in the fifth century [14] who coined the neologism, “*De canino raptu, quem Græci κυνικόν σπασμόν*” [15], what the Greeks called “cynic spasm” [16]. This pathology is currently known to be a focal dystonia called oromandibular dystonia. For Pujol, “it is more than likely that this spasmodic & idiopathic disease of the face more or less owes its appearance to the same causes of *tic douloureux*, & it must also be attributed to some acrid & tenacious humour that has lodged itself fixedly near certain nervous fibres”. He anticipated the objection to aligning two diseases so different in their symptoms by making a phenomenological analogy between the briefness and repetition of the muscular spasm in *raptus caninus* and the painful, brief, intense, and recurring discharge in *tic douloureux*. For him, these two disorders were tics, one painful and the other not. But while fixity was characteristic of *tic douloureux*, for Pujol, *raptus caninus* frequently progressed by extending to other locations in the body, his descriptions of which indicate cervical dystonia and blepharospasm. Another difference is that, by his own admission, he was never able to halt *raptus caninus*.



## Treatment of tic douloureux

Pujol recommended treating patients with opium preparations at increasing doses until beneficial somnolence was attained. In addition, “a linen folded in four and soaked in henbane & poppyhead should be applied to the place from which these shooting pains originate, or cotton soaked in Sydenham’s tincture”; the dressing was left in place for several hours. By the general route, drinking abundant quantities of donkey, mare, or goat milk, along with chicory, hemlock, or white henbane, increased the efficacy of prolonged baths in water at body temperature. In stubborn cases, he advised applying “a cautery placed at the nape of the neck, behind the ear, or on the arm of the diseased side”. He did not categorically rule out bloodletting but found that it was rarely useful. Still experimental and very rarely used at the time, electricity was interesting to Pujol but only “in an ordinary electric bath”. As for magnets, they were viewed favourably as efficacious in this indication in the assessment report presented in 1779 to the Royal Society of Medicine by Michel-Augustin Thouret (1749–1810) and Charles-Louis Andry (1741–1829); they published their report as a book in 1782 [17]. But Pujol had serious reservations. All his own therapeutic tests were unsuccessful because, according to him, “the exalted imagination of some patients that, on so many occasions, abets the Charlatan, can at times fool those of good faith & trick even the most practised masters”. Pujol was perspicacious in concluding that “in Man, the physical side and the moral side at times act so confusedly that it is very easy to delude oneself when trying to assess the real value of certain remedies of which the action is not very clear”.

## Why did Pujol use the term “tic”?

The hippiatrist Carlo Ruyni (1456–1530) of Bologna in Italy was the first to use the word “tic” in a posthumous work on veterinary medicine published in Venice in 1598 [18]. Ruyni employed this term in the section *Spasmo delto tico mortale* to distinguish between contractions secondary to tetanus and dystonic spasms observed in some horses: “Et en differenza del tico secco, il quale a più tosto vitio che male”; that is, unlike in tetanus, the dry (isolated) tic was brief and not fatal. In French, “tire-sec” (literally, “dry pull”) is used to describe a sharp pulling movement. Ruyni’s book was translated in 1647 by Jean Jourdin (16?–17?), a French physician: “The tic, according to Ferrare, results from the retraction of nerves originating in the brain and is caused by excessive heat or cold, or by an immoderate flow of blood. The signs of this disturbance are seen when the horse twists its head, pricks up its ears, rolls its eyes, locks its mouth, extends its tail, pulls in its flanks, and finally, sinks its teeth into the feeding trough and damages it by arching its neck” [19]. Ruyni was referring to Giovanni Battista Ferraro (1528–1569) who had described a spasm in a horse with tetanus, said to be suffering from a “tiro mortale” [20]. When a horse experiences discomfort, it may pull on its halter by arching its neck abruptly, a “tire-sec”. So the origin of the word “tic” does appear to be Italian; “tiro-secco”, like the French “tire-sec” above, became by abbreviation “tichio” (“caprice”, from “capra” or “goat” in Italian). The French became “tique”, “ticq”, and finally “tic”. The same root

for this onomatopoeia can be found in other languages. In German: Zucken, zugen, tucken, ticken (touch lightly), and tick. In Spanish: tico. And in English: tugg and tick [21].

The suddenness and abruptness of tic douloureux, which “suddenly seizes its subjects & takes them by surprise”, explains Pujol’s use of the word “tic”. As for the qualifier “douloureux”, it clearly expresses the wrenching pain that characterises this pathology. The word “neuralgia”, explicitly qualifying the nervous substrate of the pain, would only be used starting in the nineteenth century.

## Pujol’s predecessors

Descriptions of pain in the face compatible with the diagnosis of facial neuralgia are reportedly found in the writings of Avicenna (980–1036) and of Persian authors [22]. The numerous and inaccurate descriptions of various types of head pain written in past centuries were undoubtedly referring to cases of trigeminal neuralgia poorly differentiated from migraines, tumours, dystonia (cynic spasm), or contracture as sequelae in Bell’s palsy.

It was probably the disciples of Johannes Laurentius Bausch (1605–1665) (Fig. 3) who pioneered the description of this condition, recording the suffering endured by their teacher, the founder of the German Imperial Academy of Natural



Figure 3 – Johannes Laurentius Bausch, first known case of trigeminal neuralgia, [17] (© BIU santé, University of Paris).

Sciences Leopoldina in 1652. In their biography of Bausch, Johan Michael Fehr (1610–1688) and Elias Schmidt reported in 1671 that he suffered from sharp flashes of pain toward the right jaw for four years: “On 05 November 1664, the pain was so intense that our beloved master could not get out of bed. Suddenly, the pain penetrated his jaws and his brain like lightning. He could barely speak any more and was unable to take solid food. The neuralgia was complicated by scurvy. He fought bitterly against this new disease but was never able to completely overcome it” [23]. That said, his death may have been caused by jaw cancer.

En 1957, Kenneth Dewhurst (1919–1984) published the transcription of an epistolary exchange between the English John Locke (1632–1704) and his friend, John Mapletoft (1631–1721). Locke tells of how, on the night of 04 December 1677, he was called to the bedside of the Countess of Northumberland, wife of the French ambassador, who was suffering atrociously from spasms on the right side of her face. A few months earlier in France, physicians had extracted teeth in an unsuccessful attempt to treat these painful attacks. Locke wrote, “When the fit came, there was, to use My Lady’s own expression of it, as it were a flash all of a suddaine shot into all those parts, and at every one of those twitches which made her shreeke out, her mouth was constantly drawn on the right side towards the right ear by repeated convulsive motions, which were constantly accompanied by her cries” [24]. Mapletoft sent these letters to other physicians, notably Thomas Sydenham (1624–1689). They make it impossible to doubt that Locke had written one of the first truly accurate and detailed observations of a case of trigeminal neuralgia.

In 1692, Johann Jakob Wepfer (1620–1695) treated a woman by the name of Marie Furrerin. This observation number L of his pathology treatise published in 1727, covering hemacrania, is an accurate clinical description of facial neuralgia, both in terms of the localisation described and the hyperalgesic stabs of pain: “hemicrania sæva, cruel hemacrania” [25].

In his treatise on dilations of the urethra using candles he made himself, Nicolas André (1704–circa 1780), surgeon of the Royal House of Versailles from 1729 [26], added a discussion “of certain convulsive movements” in which he coined the expression “tic douloureux” to describe cases he had treated [27]. While his first patient, suffering from a cheek fistula, probably did not have real trigeminal neuralgia, his second patient clearly suffered from it. His “pain, of the cruellest sort, arising from tic douloureux, was located in the lower left jaw, or rather in a branch of the fifth nerve pair called the lower maxillary branch, which leaves the mandibular canal by the mental foramen. The patient can find no relief from this relentless pain”. He treated him with “cauterising stones” to create a purulent eschar and expose the maxillary nerve and the adjacent blood vessels: “I pinched them & shook them slightly”, which supposedly cured the patient. This work is frequently referred to as the first to describe trigeminal neuralgia. In fact, only the name of the condition, *tic douloureux*, used until the beginning of the twentieth century, should be associated with this recension.

Thouret and Andry, in their report to the Royal Society of Medicine, mentioned the thesis of Pierre-Marie Vieillard (?–1770), defended in Paris on 10 March 1768, with the dean Guillaume Joseph de L’Épine (1703–1783) presiding over the jury. Vieillard described the suffering of a Premonstratensian prior, typical of trigeminal neuralgia, and noted that the pain disappeared after the maxillary nerve was cut where it exits

the infraorbital canal; Antoine Louis (1723–1792) performed the surgery. This immediate success did not, however, continue after the surgery. Vieillard did not mention the progression which must have been disappointing [28].

In 1773, the English John Fothergill (1712–1780) presented to the Medical Society of London his paper entitled *A Painful Affection of the Face*, leading some to consider him as the author of the seminal description of trigeminal neuralgia. His paper included sixteen cases he had observed and perfectly described [29]. This is the origin of the British expression *dolor faciei Fothergilli*, or *Fothergill’s disease*. Pujol himself wrote, “Doctor Fothergill was, however, the first to describe it with some degree of exactitude in a book in English published in London in 1776” (the first edition of Fothergill’s book dates from 1773). His great grand-nephew, Dr Samuel Fothergill (1780–1822), a physician at the Western Dispensary in London, published in 1804 fourteen further cases of *tic douloureux* which he attributed to compression of the fifth cranial pair by a process he called “cancerous acrimony”, indicating that the process was expansive [30].

In 1778, Marie-René Bonnard (1753–1830), a surgeon in Hesdin in the Pas-de-Calais region, recounted the torments of a forty-seven-year-old woman: “With each flash of pain, she seemed to feel a million pin pricks & a flame rise up in the painful part”; that is, under the left zygomatic process. No treatment ever brought relief over a period of around ten years [31]. Bonnard concluded his brief article this way: “We invite physicians to send us their impressions of this disease & to indicate the treatment they have found to be most suitable”.

### Following Pujol’s book

Once Pujol’s book was published, Thouret, who had proof-read the material, presented a long paper to the Royal Society of Medicine in 1787 [32]. In his discussion of fourteen personal cases, he added the notion of a “trigger area” that, when touched lightly, caused the painful attack. His long presentation was a panegyric review of all Pujol’s arguments.

The first thesis on *tic douloureux* was defended in Paris in 1803 (year XI according to the French revolutionary calendar) by Jean Philippe Hamel (1777–1848). It introduced the term “facial neuralgia” which Hamel defined as follows: “Neuralgia is the painful affection of a nerve and is characterised by the type of pain. It is sharp, wrenching, often with pulsation and stabbing, though without apparent redness, heat, or swelling of the affected part, often accompanied by spasms and convulsive movements which, through repetition, degenerate into a tic or a vicious habit” [33]. The definition also included the localisation along the trajectory of a nerve branch.

The following year, Guillaume-Antoine Soulagne (17?–18?) defended his thesis in Montpellier on 23 January 1804 (2 Pluviose year XII) before spending his entire career in his native city of Villeneuve-les-Béziers in the Hérault region (Fig. 4) [34]. Explaining “an exaltation of feeling”, as opposed to “a paralysis of feeling”, in reference to sensitivity, Soulagne explicitly distinguished motor tics, “the cause of which lies in the muscles”, from *tic douloureux*, the cause of which he considered to lie in the nerves. He cited Pujol to criticise him. Soulagne paradoxically remained a staunch supporter of the



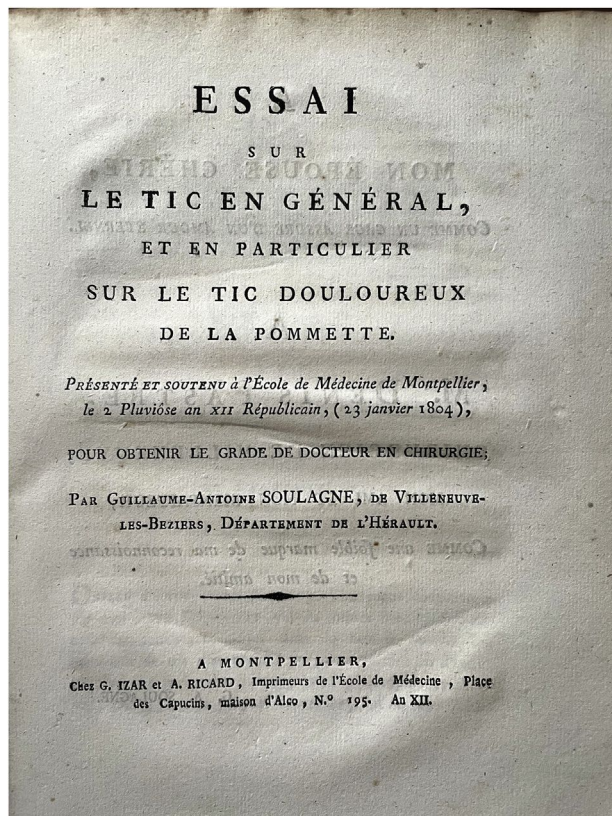


Figure 4 – G.-A. Soulagne, *Essai sur le tic en général et en particulier sur le tic douloureux de la pommette*, thesis in Paris on 23 January 1804 (Collection OW).

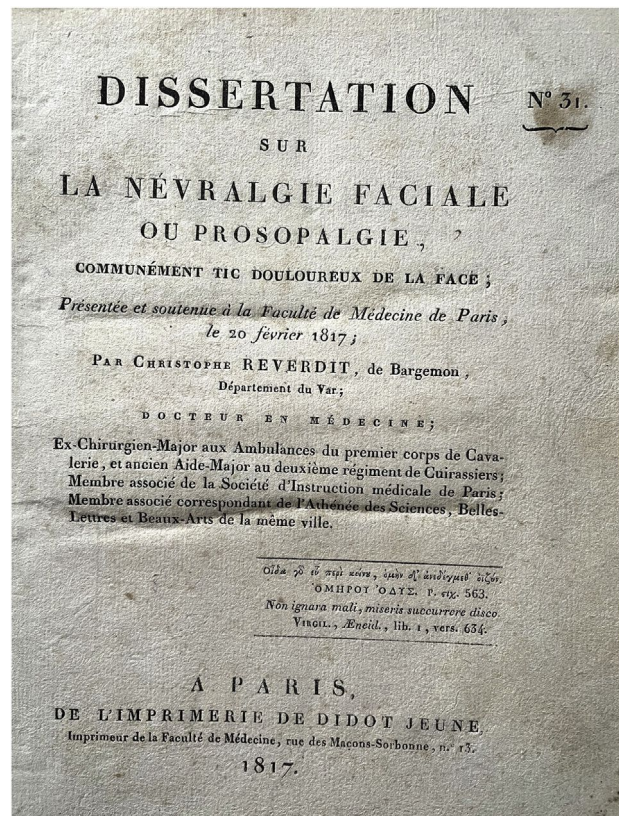


Figure 5 – Christophe Reverdit. *Dissertation sur la névralgie faciale ou prosopalgie communément tic douloureux de la face*. Thesis in Paris on 20 February 1817 (Collection OW).

theory of humours and rejected the innovative ideas put forward by Pujol on the role of nerves as electrical conductors. His therapeutic recommendations were in line with the principles of the time—notably, and no doubt cruelly, the use of cauterisations of the cheek.

In 1816, Jean-Baptiste Méglin (1756–1825) argued that the diagnosis of facial neuralgia should not be made until after the multiple other causes of pain were eliminated, which causes he went on to review. He did not fail to describe treatments, including pills he prepared himself, containing sublimed zinc, extract of black henbane, and wild valerian. This remedy would make him known in the treatment of migraine for several decades [35].

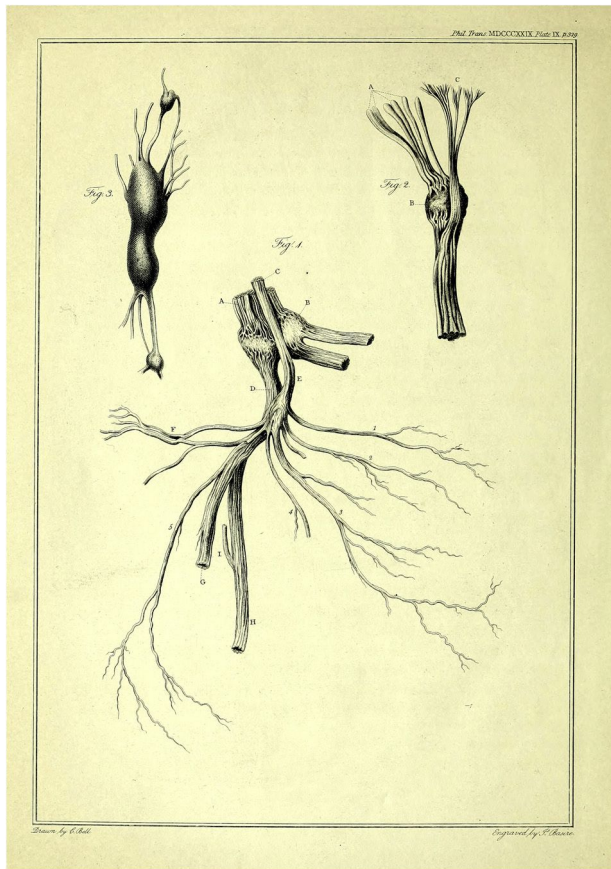
Reusing much of a publication by the German Johann Georg Christoph von Siebold (1767–1798) of Würzburg, which appeared in 1795 [36], Christophe Reverdit (1790–1846) defended his thesis in Paris on 20 February 1817: *Dissertation sur la névralgie faciale ou prosopalgie communément tic douloureux de la face* (dissertation on facial neuralgia or prosopalgia, commonly known as *tic douloureux* of the face) (Fig. 5) [37]. He included a very detailed historical review, mentioning authors such as Johann-Hartmann Degner (1687–1756), working in 1724, and Thomas Bertholin (1637–1680), along with other, lesser-known authors. (However, I did not find in their works the descriptions Reverdit mentioned.) Reverdit saw himself as a successor of François Chaussier (1746–1828) who, in 1802,

published *Table synoptique de la névralgie, suivant la nomenclature méthodique de l'anatomie* (summary table of neuralgia according to the methodical nomenclature of anatomy) [38]. In it, Chaussier distinguished the three branches of the trigeminal nerve, in frontal neuralgia, infraorbital neuralgia, and maxillary neuralgia. While Chaussier, like Hamel, proposed replacing the term “*tic douloureux*” with “*facial neuralgia*”, Reverdit substituted the term “*prosopalgia*”. As for the thesis of Pierre-Martin Roux, defended in Montpellier in 1817, it provided no new elements aside from introducing the term “*neuroprosopalgia*” [39].

As for the Scottish Robert Nasmyth (1791–1870), in his thesis defended in Edinburgh in 1823, he cited many French authors and English-language authors but did not mention Pujol [40]. In his thesis defended in 1829, Pierre Régner (1801–1873) asserted that the only effective treatment for the pain was repeated bloodletting and leeches arranged along the trajectory of the facial nerve [41]. That same year, Charles Bell (1771–1842) set forth the sensory and motor functions of the three branches of the trigeminal nerve (Fig. 6) [42].

The Box 1 summarises the main publications on this disease up to 1832; all of them cite Pujol’s book.

François Louis Isidore Valleix (1807–1855) began his famous *Traité des névralgies ou affections douloureuses des nerfs* (treatise on neuralgia or a painful affection of the nerves), published in 1841, by a chapter entitled “*Trifacial neuralgia*” [43]. He



**Figure 6 – Drawing of the trigeminal nerve by Charles Bell in 1829, [42] (Wellcome Collection, public domain).**

established a complete summary of what was known up to that point, but cited Pujol only barely and with disdain. The anatomy of the trigeminal nerve and the clinical aspects of neuralgia were by then well established. The discussion of causes was long but did not make any clear conclusions. As for treatment, Valleix recommended quinine, isolated from cinchona bark in 1820 by Joseph Pelletier (1788–1842) and Joseph Caventou (1795–1877), and “les pilules de Mèglin”. Despite the commercial success of these pills, Valleix admitted that they had a limited effect on the pain and recommended the prescription of morphine.

Armand Trousseau (1801–1867) entitled his clinical lesson at Hôtel-Dieu hospital in 1861 “Epileptoid neuralgia” but used the term “*tic douloureux*” in his presentation [44]. In his literary style, so enjoyable to read, he admitted he felt powerless when it came to relieving his patients, aside from the use of opium. He opposed all surgical attempts that slashed the cheeks but produced no results. At no point did he cite Pujol.

As to the lesson that Georges Gilles de la Tourette (1857–1904) published in 1898, it referred mainly to Trousseau and made no mention of Pujol [45]. Gilles de la Tourette focused on what he called a hysterical form, the subject of the thesis by his student Jacques Artières (1863–1892) in 1891 [46].

### Box 1. Main publications on this disease up to 1832; all of them cite Pujol's book.

Hamel JP. De la névralgie faciale, communément tic douloureux de la face. Thèse Paris n°242: Valade; 1803.

Bonnet M. Observation sur la guérison du tic douloureux ou névralgie faciale au moyen de l'usage externe du gaz oximuriatique. Montpellier ; 1813.

Méglin JBA. Recherches et observations sur la névralgie faciale, ou le tic douloureux de la face. Strasbourg: Levraut; 1816.

Roux PM. Essai médico-chirurgical sur la névroprosopalgie, ou le tic douloureux de la face. Thèse Montpellier n°87: Jean Martel aîné; 1817.

Reverdit C. Dissertation sur la névralgie faciale ou prosopalgie, communément tic douloureux de la face. Thèse Paris n°31 : impr Didot Jeune; 1817.

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### In conclusion

The book that Pujol wrote on trigeminal neuralgia, while not a seminal description, is a valuable clinical summary that helped his contemporaries make an exact diagnosis, even though it did not offer a proven treatment. Pujol adhered to the theory of electricity, seeing it as the vector in nerves for transmitting information. This put him in a position to propose a novel pathophysiological theory of pain, not yet qualified as neuralgic. His thinking illustrates that, at the dawn of the nineteenth century, a provincial physician working alone was able to make his contribution to building medical knowledge, particularly in the field of neurology (Box 2).

### Statement of ethics

This work required no approval from an institutional review board and was prepared in accordance with the ethical guidelines of the journal *La Revue Neurologique*.



**Box 2. List of works published by Alexis Pujol.**

Observations sur la fièvre miliaire épidémique qui régna dans le Languedoc en 1782 (1783).  
 Dissertation sur les maladies de la peau (1786).  
 Essai sur le vice scrophuleux (1787).  
 Dissertation sur l'art d'exciter et de modérer la fièvre, pour la guérison des maladies chroniques (1787).  
 Mémoire sur une fièvre puerpérale suivie d'un épanchement laiteux dans l'abdomen et d'un dépôt énorme, terminé par une fistule au nombril (1787).  
 Mémoire et observations sur l'utilité de la méthode de Leroux pour la cure prophylactique de la rage (1789).  
 Essai sur les maladies héréditaires (1790).  
 Essai sur les maladies propres à la lympe et aux voies lymphatiques (1790).  
 Essai sur les inflammations chroniques des viscères (1791).  
 Essai sur la nature du vice rachitique et sur les indications essentielles et accessoires que ce vice offre à remplir (1792).  
 Mémoire sur une colique hépatique par cause calculeuse (1795).

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