

# Beethoven's deafness, other ailments, and death re-examined



Beethoven on his deathbed. Drawing by Josef Danhauser, Vienna, 1827. Getty Images DEA / A. DAGLI ORTI / Contributor

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The year 2021 marked the 250th anniversary of the birth of Ludwig von Beethoven, who throughout most of his life was victimized by a host of seemingly unrelated ailments, which finally killed him at age 56 years. Although Beethoven's medical history has been analyzed repeatedly by medical experts since his death, no consensus has been reached as to the etiology of his deafness, other ailments, or death. This is in spite of a wealth of information

concerning his medical history recorded in 137 conversation books (books containing uncensored transcripts of personal conversations between the composer and associates during his final decade), his *Heiligenstadt Testament*, and his *Tagebuch* (a diary covering 1812–1818).<sup>1-4</sup>

Additional information contained in the report of an autopsy performed by renowned 19th century Viennese pathologists Dr. Johann Wagner and Dr. Karl von Rokitansky<sup>2</sup> should have been definitive. However, like a chemical analysis of eight strands of Beethoven's hair in 1999 showing concentrations of lead 100 times higher than normal,<sup>3</sup> Beethoven's autopsy report has raised more questions than answers.

This body of information reveals a great deal about both the clinical characteristics and the anatomy of Beethoven's many ailments, but, unfortunately, no definitive diagnosis.

This also doesn't settle the question of how many different disorders might have been at play in destroying the composer's health and quality of life.

Based on the above documents and various letters, we know that Beethoven suffered nearly continuously from a multitude of ailments beginning in his teens and continuing until his death. For him, the most distressing of these, and the one most familiar to the general public, involved the destruction of his auditory nerves, which were left shrunken and useless after years of pain and ringing in his ears. His earliest recorded physical complaints were recurrent abdominal pain and diarrhea. Tormenting headaches beginning in his 40s, and rheumatism and inflamed eyes in his 50s, were added to his misery, generating additional tentative diagnoses by clinicians trying to understand the reason for the composer's poor health. An autopsy created still more diagnostic possibilities by revealing abnormalities of the brain, pancreas and kidneys.<sup>2</sup> However, macronodular cirrhosis was the disorder that proved to be Beethoven's most serious ailment, ultimately killing him after producing massive ascites, epistaxis, hemateme-  
 sis, and terminal delirium.

Myriad questions abound regarding this disparate collection of ailments. Are they related in some way? Was a single underlying disorder responsible for all or most of them? Was Beethoven simply the unfortunate victim of a host of different disorders? What of the abnormalities of the brain, pancreas, and kidneys identified post mortem, and the elevated levels of lead detected in Beethoven's hair? Can the Law of Parsimony (*non sunt multiplicanda entia sine necessitate* or Entities should not be multiplied without necessity) articulated by William of Occam in the 14th century<sup>5</sup> be applied to the composer's case to arrive at a single unifying diagnosis? Or, is Hickam's dictum ("A man can have as many diseases as he damn well pleases"<sup>6</sup>) the key to diagnosis?

### Myriad ailments

If Beethoven's years of suffering were not the work of a

**Beethoven's ailments<sup>4</sup>**

Year	Age	Ailment
c. 1775	Childhood	Smallpox
c. 1788	Teens	Episodic abdominal pain and diarrhea <sup>1</sup>
1796	26-years-old	Deafness, tinnitus and odynacusis; <sup>2</sup> typhus
1803	33-years-old	Recurrent feverish catarrhs
1816	46-years-old	Rheumatism and recurrent bronchitis
1820	50-years-old	Jaundice <sup>3</sup>
1821	51-years-old	"Gout in the chest" <sup>4</sup>
1822	52-years-old	Eye pain and photophobia <sup>5</sup>
1824	54-years-old	Epistaxis and hemoptysis
1826	56-years-old	Ascites, hemoptysis, delirium <sup>6</sup>
1827	57-years-old	Death

single disease but of several, as reflected in Hickam's dictum, what might they have been? Beethoven attributed his deafness to an attack of typhus which coincided with the onset of his auditory difficulties.<sup>2</sup> In fact, in some series, typhus has been associated with prominent auditory symptoms, including deafness, tinnitus, and vertigo. However, such symptoms are rare, and although relapses of the disease (typically milder than the initial attack) occur, a chronic, progressive form of typhus has not been described.<sup>7</sup>

The elevated concentration of lead detected in the sample of Beethoven's hair postmortem raises the possibility that at least some of his complaints were due to chronic lead intoxication (plumbism). Lead is toxic to the

intestine, liver, kidneys, and nervous system, all of which were deranged in Beethoven. However, colic, one of plumbism's most prominent symptoms, manifests as abdominal pain, cramps, nausea, vomiting, anorexia, and constipation, not diarrhea, which was one of Beethoven's most persistent complaints.

Lead is also toxic to nerves, principally motor nerves, causing weakness, and in some cases paralysis. The acoustic nerves can be injured but

are typically spared. While lead damages both the liver and kidneys, mild hepatitis, not macronodular cirrhosis, and progressive kidney fibrosis, not papillary necrosis (the condition most consistent with the "calcareous concretions" found in Beethoven's kidneys) are the typical hepatic and renal abnormalities seen in cases of chronic lead intoxication.<sup>8</sup>

Beethoven's deafness, which was as mysterious as it was ironic, had a character and course unlike any disorder of acoustic nerves encountered in clinical practice today. Current clinical experience has little to offer in pointing to the cause of Beethoven's progressive deafness. However, clinical experience prior to the antibiotic era is another matter. Clinicians then saw many cases of slowly progressive, bilateral destruction of acoustic nerves. More often than not, the cause was syphilis.<sup>4</sup>

If Beethoven were alive today, his cirrhosis would most likely have been caused by chronic alcoholism and/or

viral hepatitis. Alcoholic cirrhosis, however, tends to be micronodular, whereas Beethoven's cirrhosis was macronodular. The cirrhosis resulting from viral hepatitis, which alcohol potentiates, is typically macronodular. Thus, a contemporary patient with Beethoven's social history and liver abnormalities would most likely have cirrhosis due to a combination of viral hepatitis and chronic alcohol abuse. Although viral hepatitis (in particular, hepatitis caused by the hepatitis C virus) is the most common cause of cirrhosis in Europe today, the absence of injection drug abuse during Beethoven's time would have made the infection considerably less common.<sup>9</sup>

Little is known about Beethoven's recurrent attacks of rheumatism. His joints began bothering him when he was in his 40s and therefore would not likely have been due to degenerative arthritis. One of the acquired forms of arthritis associated with abnormalities of other organ systems would have been more likely. Gout, for example, sometimes affects the kidneys along with the joints, especially when the disorder occurs as a complication of chronic lead intoxication. Lyme disease, an important cause of arthritis today, occasionally attacks the facial nerve and sometimes the auditory nerve. Beethoven loved nature and could have been exposed to *Borrelia burgdorferi*, *B.garinii*, or *B. afzelii* during one of many pastoral excursions.<sup>10</sup>

Beethoven's eye problems, likewise, are poorly documented in the historical record. His letters make it clear that he suffered greatly in his 50s with recurrent episodes of ocular pain aggravated by light. If he had interstitial keratitis or uveitis, which seems likely based on his symptoms,<sup>11</sup> a number of diseases might have been responsible.

Formerly, congenital syphilis was the most common cause of interstitial keratitis. Today it is usually the result of a herpes simplex infection. Cogan's syndrome, tuberculosis, and leprosy are other more rare causes. Uveitis is also a complication of syphilis, as well as of herpes simplex, rheumatoid arthritis, and sarcoidosis.<sup>12</sup>

The "calcareous concretions" found in Beethoven's renal calices were almost certainly indicative of papillary necrosis caused by long-term use of salicin given to him by his apothecary brother to relieve his headaches, abdominal pain, and rheumatism.<sup>2,13</sup> Long-term analgesic abuse might also explain the "cellular membrane of an inch thick" found surrounding the composer's kidneys on post mortem examination.

There was some degree of cerebral atrophy in Beethoven's brain at the time of his death, though apparently not enough to have impaired his artistic creativity. Chronic alcohol abuse might have been responsible for the atrophy, however, in view of his long history of tormenting headaches, a chronic cerebritis of unknown etiology is another possibility worth considering. This could have been readily verified (or excluded) if the composer's brain could have been examined microscopically.

### Single disease?

If Beethoven's many ailments were the result of a single disease, rather than a conflation of many diseases, no disorder offers a better explanation for the character, course and social milieu of his complex illness than syphilis. The full spectrum of disabilities caused by the infection has been largely forgotten, thanks to the advent of penicillin.

However, upon examining the extensive literature devoted to syphilis prior to the antibiotic era, the disorder emerges as a highly satisfactory explanation for almost all of Beethoven's ailments.

*Treponema pallidum* attacks the vessels, membranes and supporting tissues of the nervous system, as well as the nerves.<sup>14</sup> The net result is a wide array of potential neurological abnormalities, the character of which is dictated in any given patient by various parasite and host factors, only some of which are understood.

Destruction of the acoustic nerve occurs in less than one in 1,000 cases of untreated syphilis, but in as many as two to three percent of those who exhibit evidence of

### Findings listed in the official report of Beethoven's autopsy<sup>2</sup>

Much thickened Eustachian tube
Shriveled auditory nerves with enlarged, cartilaginous adjacent arteries
Cerebral convolutions full of water and very much deeper, wider and more numerous than ordinary
Very dense and thickened calvarium
Normal appearing lungs
Four quarts of turbid abdominal fluid
Lumpy, leathery liver beset with knots the size of a bean
Enlarged spleen
Hard, firm pancreas with enlarged excretory duct
Kidney invested by a cellular membrane an inch thick, infiltrated with a brown, turbid fluid and calices occupied by a calcareous concretion as large as a split pea

Gross findings, no microscopic examination was performed.

neurosyphilis. Tinnitus, which Beethoven had, is frequent, as is vertigo, which he did not have.

Acoustic nerve deafness is especially common in cases of congenital syphilis. It develops in as many as 10 percent of untreated cases.<sup>14</sup> The onset of such deafness is usually delayed until after puberty, and is always bilateral.<sup>15</sup>

Invasion of the meninges by *T. pallidum* causes some of the earliest symptoms of neurosyphilis.<sup>16</sup> Headache, with which Beethoven suffered greatly, is particularly common. In earlier times, such patients were thought to be suffering with migraines.<sup>17</sup> Invasion of the cerebral vessels by *T. pallidum* causes cerebral atrophy of the kind detected in Beethoven's autopsied brain.

Beethoven's inflamed eyes can also be explained by syphilis, which causes an array of eye abnormalities, including interstitial keratitis, uveitis, keratovitis, neuroretinitis, chorioretinitis, and optic atrophy.<sup>12</sup> In cases of untreated congenital syphilis, interstitial keratitis is the most common abnormality, and the one most consistent with Beethoven's eye pain and photophobia in the apparent absence of ocular discharge. Children with congenital syphilis, like adults with the acquired form of the infection, sometimes do well for decades before developing eye problems.<sup>15</sup>

Chronic inflammation of the liver, sometimes progressing to cirrhosis, is another complication of both acquired and congenital syphilis.<sup>14</sup> In advanced cases the liver is riddled with discrete inflammatory nodules (i.e., gummas) with intervening fibrosis, producing a picture of macronodular cirrhosis like that found in Beethoven. Alcohol, which Beethoven consumed in large quantities, potentiates the toxicity of syphilis for the liver.<sup>18</sup> Gummas and fibrosis similar to those developing in the liver are also seen in the pancreas of patients with long-standing syphilis.<sup>14</sup>

Stomach trouble of the kind that plagued Beethoven for most of his adult life is a common complaint of patients with untreated syphilis. During the pre-antibiotic era, nearly one-third of patients with early syphilis reported gastrointestinal problems as at least a minor feature of their illness. In untreated cases of late syphilis, stomach trouble was even more common, and when present was the chief complaint 90 percent of the time. Patients with neurosyphilis seemed to have the most gastrointestinal complaints, which were thought to be due to malfunction of the vagus nerve, rather than direct invasion of the gastrointestinal tract by *T. pallidum*.<sup>14</sup>

The "great density and thickness" of Beethoven's calvarium and his rheumatism are also readily explained by long-standing syphilis. In the pre-antibiotic era, most patients with syphilis had musculoskeletal complaints

sometime during the course of their infection.<sup>14</sup> Inflammation of the skull, which was especially common, produced thickening and increased density of the calvarium. Joint pain was the chief complaint in eight percent of cases of untreated syphilis, and like Beethoven's rheumatism, was characterized by repeated exacerbations and remissions. Unlike classical rheumatoid arthritis, the rheumatism of syphilis typically does not deform affected joints or impair their function.<sup>14</sup>

The renal abnormalities caused by syphilis are protean. However, papillary necrosis is apparently not one of them.

### **Congenital**

If Beethoven did die of syphilis, when was he infected, and by whom? Syphilis was widespread in Europe during Beethoven's lifetime. By some accounts, as many as six to 10 percent of the adult population was infected with *T. pallidum*, with the highest rates observed among prostitutes and their clients during times of war.<sup>19</sup>

The Napoleonic Wars raged during Beethoven's later years. Moreover, his conversation books leave little doubt that the composer had liaisons with prostitutes during his final decade. Whether he patronized prostitutes in his early years is less clear.

If Beethoven was infected in utero—as suggested by the early onset of his symptoms, the course and character of his deafness, and his eye problems—his father would have been the one most likely to have introduced *T. pallidum* into the family blood line.

Beethoven's father (Johann) was a "wastrel, second rate musician, toady, possible police agent and a hapless extortionist."<sup>1</sup> But was he also a philanderer, who became infected with *T. pallidum* during his debauches and transmitted the infection to Beethoven's mother? There is no way of knowing for certain. What is known is that Johann Beethoven was a hopeless alcoholic, who as a married man, "spent many nights in taverns or wandering through town...arriving home in the middle of the night or early in the morning."<sup>1</sup> If he contracted syphilis in the course of these escapades, and passed the infection on to Beethoven's mother, he would not have been the first alcoholic to be swept into the channel of syphilis dissemination kept open by "the perverse genius of alcohol and commercialized sexuality."<sup>14</sup>

If Beethoven had congenital syphilis, why didn't all of his mother's children by Johann develop the disorder? When syphilis is transmitted from mother to fetus, spectacular, sometimes lethal, congenital deformities develop in the offspring that are readily apparent in early childhood. These

are the deformities that dominate classical descriptions of congenital syphilis in modern medical textbooks.

However, inapparent (latent) congenital infections also occur, in which clinical manifestations of the disorder are delayed, sometimes for as long as 35 to 50 years.<sup>20</sup> This would have been the case with Beethoven, whereas his older brother, who died as an infant, might have had lethal deformities caused by the infection.

In some cases, deformities never develop, especially among later off-springs of an infected mother, such as would have been the case with Beethoven's two younger brothers—one of whom died of tuberculosis at 41-years-old, and the other, a physically robust apothecary, who outlived the composer by many years.

### Forever a mystery

Due to limitations of the historical record, the lack of a microscopic examination of Beethoven's remains, and the absence of definitive laboratory test results, Beethoven's diagnosis (or diagnoses) will forever remain a mystery. The number and diversity of his various ailments have led to a long list of possible diagnoses. Nevertheless, no diagnosis explains the cause of as many of Beethoven's ailments or is more consistent with the course, character, and social milieu of his complicated medical history than syphilis, in particular, congenital syphilis.

Unlike Padget's disease, Whipple's disease, sarcoidosis, or any of the numerous other disorders offered over the years as Beethoven's diagnoses, syphilis is a disease considered too banal, too unbecoming to have extinguished the life of such a remarkable man. Even in his own lifetime, Beethoven was regarded as one of the illuminati, and his stature has only grown with the passage of time. This has resulted in a mounting reluctance to accept the possibility that he might have died of an ordinary disease.

The thought that syphilis might have been the disease that silenced the source of some of the most sublime sounds ever conceived offends our sense of cosmic harmony. Nevertheless, whereas Beethoven was an artist, he was also a man, and like all men, destined to die of a disorder not of his choosing. It made no difference to the disease that took him that his nine symphonies, five piano concertos, violin concerto, 17 string quartets, opera; and 32 sonatas were some of the most brilliant ever composed.

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