

Heinrich Schliemann, his ear disease and hearing impairment: an extraordinary life with a pitiable finale for the most illustrious *dilettante* in the history of archaeology

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Abstract: Heinrich Schliemann was a worldwide celebrity in the late 19th century, and his lasting fame derives more from his adventurous undertakings as an amateur archaeologist than from his remarkable success as a businessman. His medical history and the circumstances in which he died in Naples in 1890 have aroused great interest in the international scientific community. The fact that this occurred after surgery performed in Halle by Prof Hermann Schwartze for exostoses and possible cholesteatoma that had caused a severe hearing loss, unbearable for the hyperactive Schliemann, has particularly intrigued otologists and audiologists and made them particularly eager to investigate and reflect on the matter. Medical data on Schliemann's otological disease and the way he was reacting to it, transpire from his correspondence and diaries, direct witness statements regarding his (now lost) medical records, together with accounts of his condition during his last days given by Vincenzo Cozzolino, the last otologist who tried to cure him. An analysis of all the available sources points to an otogenic cerebral abscess complicating Schliemann's chronic ear disease after surgery as the main factor behind the death of the most prominent amateur archaeologist in history. Despite the difficulty to ascertain some details, this paper, based on an extensive use of original data, focusses not only on the possible causes behind this fatal disorder but also on the elements of Schliemann's character that determined his choices on the timing and manner of treatment and eventually led to a tragic ending for his spectacular life.

Keywords: Schliemann, early ear and mastoid operations, Hermann Schwartze, Vincenzo Cozzolino, otogenic cerebral abscess, hearing loss.

Introduction

The early years

Heinrich Schliemann was born on 6 January 1822, in the small village of Neubukow in the Duchy of Mecklenburg-Schwerin. He said that it was his father Ernst, a protestant minister, who introduced him to Homer's poems by telling him stories from the Iliad and Odyssey, and giving him a copy of Ludwig Jerrer's Illustrated History of the World, which contained a picture of Troy in flames (Schliemann 1881). He also said that by age 8 he had already decided that he would search for Troy,

though there is no proof of this early passion for Homer and for Archaeology, which was still in an embryonic stage in the 1820s and '30s (Cervetti, Godard 1996).

After his mother's death and his father's removal from office, accused of immoral conduct, the resulting financial difficulties obliged the boy to leave school at age 14 and start working at a grocery store in Fürstenberg (Cervetti, Godard 1996).

Business activities

Schliemann left Fürstenberg five years later, in 1841. After a brief period in Hamburg, he embarked on a steamer heading for Venezuela, but a shipwreck brought him to the Netherlands, where he worked for a few years as a clerk in Amsterdam (Ludwig 1931). While there, he invented a particular system that enabled him to learn at least fifteen languages during his life (Schliemann 1881), (Cervetti, Godard 1996), (Ludwig 1931). He claimed to have learned Russian in six weeks and he settled in St. Petersburg in 1846 as an agent for BH Schröder & Co. He later established his own firm and made a considerable fortune with his import-export and stock trading activities (Cervetti, Godard 1996), (Ludwig 1931).

Schliemann further increased his fortune by moving to America in the years 1850-52 and going into the gold trade during the California gold rush (Schliemann 1881), (Cervetti, Godard 1996), (Ludwig 1931), and then by returning to Russia as a military contractor during the Crimean war. He virtually retired from active business by 1858 (aged 36), and moved to Paris in order to dedicate himself to his cultural interests (Ludwig 1931).

Schliemann the archaeologist could never have existed without Schliemann the businessman (Cervetti, Godard 1996).

Personal life

In 1852 Schliemann married an upper-class Russian woman, Ekaterina Lishina, who gave him three children (Cervetti, Godard 1996), (Ludwig 1931) (Poole, L., Poole, G., 1966). They divorced in 1869 and the 47-year-old Schliemann chose a Greek wife, the 17-year-old Sophia Engastomenos, who gave him a son Agamemnon and a daughter Andromache, and who became his faithful companion in life and in his expeditions (Cervetti, Godard 1996), (Poole, L., Poole, G. 1966).

Intellectual background

Schliemann was essentially self-educated and, during the first three decades of his life, his studies seemed to have been principally utilitarian, in fields like languages and accounting (Cervetti, Godard 1996), (Ludwig 1931).

By the late 1850's Schliemann developed new cultural interests and, for the next 10 years, he travelled around the world to

Greece, the Near and Far East, North and South America, writing his diaries directly in the local languages (Ludwig 1931). In Paris he conducted studies mainly in history and archaeology (Cervetti, Godard 1996), (Poole, L., Poole, G. 1966).

Schliemann's career as an archaeologist

After a few early expeditions and excavations in 1868, mainly in Odysseus's Ithaca and Troy, Schliemann chose to embrace the conviction that Troy was located on a hill near the village of Hissarlik, near the Hellespont in Turkey, where some digging had already been done, going against the prevalent theory that placed Troy near the town of Bournabashi (Cervetti, Godard 1996), (Ludwig 1931) (Poole, L., Poole, G., 1966). Schliemann obtained the necessary permission from the Ottoman Empire and started his excavations in 1871 (Cervetti, Godard 1996), (Ludwig 1931) (Poole, L., Poole, G. 1966). When he finally discovered a sizeable quantity of gold artefacts (the so-called King Priam's treasure) in 1873, he smuggled them to his home in Greece, infuriating the Turks. Being unable to continue his work in Troy as a consequence, Schliemann turned his attention to Greece. In 1876 he started digging in Mycenae, restoring to the light the Mycenaean acropolis, and the magnificent "Domed Tombs". Once the dispute with the Turkish state was settled Schliemann performed new excavations in Hissarlik in 1878, 1882 and 1890. (Cervetti, Godard 1996), (Ludwig 1931). In the intervals between the Trojan campaigns, he was managing excavations at various other sites, including Ithaca, Orchomenos, Pylos, Kythera, the Marathon tomb, and Tiryns (Ludwig 1931).

Schliemann was strongly criticized for his management of the sites (where digging was done in haste and with no regard for stratigraphy) (Cervetti, Godard 1996), (Ludwig 1931), (Trail 1993), and for his treatment of the archaeological finds. There also are doubts concerning the scientificity of his attitude regarding the interpretation and classification of his discoveries as presented in his publications (Cervetti, Godard 1996). Despite all these shortcomings, however, Schliemann's work is still widely considered a milestone in preclassical archaeology (Cervetti, Godard 1996).

The relationship with Virchow

There was a very strong bond between Schliemann and Rudolf Virchow (1821-1902), father of modern cellular pathology, pioneer in anthropological studies, and politician (Ludwig 1931), (James 1979). Virchow became Schliemann's close friend and confidant, a valid adviser who helped to bring scientific quality to his work, and also his family physician (Ludwig 1931), (James 1979).

General medical history

Schliemann was generally in good health during his childhood and early adolescence, and there are no records of any major medical conditions. In previous works on Schliemann, it is reported that he contracted tuberculosis in childhood (Skoulakis, Papadakis et al. 2008) (Stoney, MacKay et al. 1991) (Yardley, Rutka 1998) citing E. Ludwig's Schliemann: the story of a gold-seeker. In the book, though, there is only a phrase used by Schliemann regarding his time in Hamburg: "I ... continued to bring up blood, and felt certain, whenever I had a slight cough, that I was consumptive" (Ludwig 1931). Anyhow it is certain that he never consulted a physician to confirm this diagnosis. Furthermore, he was in dreadful conditions, malnourished and cured himself in a way that could never have treated tuberculosis. Regarding his haemoptysis, he wrote that it first started after he lifted a heavy barrel at the grocery store at the age of 19 (Schliemann 1881) (Ludwig 1931). There are causes other than tuberculosis that might explain a case of bloody expectoration in a young man after a physical strain, such as rupture of emphysematous bullae, or vascular malformations.

During his adult life, Schliemann suffered from numerous respiratory infections and ill-defined febrile states. He was diagnosed with typhus in California, and with malaria in Troy (Ludwig 1931).

The cold bath cure

While suffering from haemoptysis in Hamburg, Schliemann started taking cold baths to fortify himself, and when his bloody expectorations finally stopped he believed that it was thanks to this treatment (Ludwig 1931). He consequently continued to bathe in cold

water whenever he could for the rest of his life, and he advised others to do so as a cure for all kinds of disease. In his book *Troy and Its Remains* he reports having cured a young girl in a village near "Troy" of a disfiguring dermatological disease by prescribing cold sea bathing (Schliemann 1875). His attachment to this personal means of self-treatment was total and he could not be convinced to abstain from it. He continued to take cold sea baths up to just a few months prior to his death, although his doctors had strictly prohibited this practice years before (Ludwig 1931) (Skoulakis, Papadakis et al. 2008) (Stoney, MacKay et al. 1991). Analysing Schliemann's psychoanalytic profile reveals probable obsessive-compulsive traits (Niederland 1967).

The otologic problem and deafness

The first signs of otologic disease appear in Schliemann in the 1860s. Prolonged exposure to cold water had led to him developing extensive exostoses in his ears (Ludwig 1931). In his diaries written while visiting Java in 1865, he refers to attacks of otorrhea, earache and deafness. He describes using ear washes with a solution containing zinc, prescribed by a specialist in Wurzburg (Prof Anton Von Tröltsch, one of the fathers of modern otology) (Schliemann 1865). As these were of little or no benefit, he underwent a first surgical procedure in Batavia on 11 March 1865, at the age of 42 (Schliemann 1865) (Deuel 1977). Schliemann reports that the operation was performed after otoscopy and nitric acid instillation, and that the surgeon (a not very well-identified Doctor Hoogenstraaten) removed granulations from Schliemann's left ear with a tool (Schliemann 1865). No precise details of this procedure are known, and there was almost no postoperative follow-up as Schliemann left Java five days later after a brief visit to the doctor (Schliemann 1865). However, we do know for sure that he continued to suffer afterwards from gradually worsening earache and hypoacusis (Ludwig 1931) (Skoulakis, Papadakis et al. 2008) (Stoney, MacKay, et al. 1991) (Yardley, Rutka 1998).

The great discomfort caused by the ear pain, and particularly the intermittent deafness prompted Schliemann to consult Prof Von Tröltsch again in 1877. The doctor noted the extent of the exostoses, ordered him

to abstain from cold bathing, and prescribed a local solution with mainly analgesic effects (Stoney, MacKay et al. 1991) (Yardley, Rutka 1998). This, however, was not sufficient to make Schliemann abandon his habit of cold bathing.

He was subsequently examined on more than one occasion by Virchow, who confirmed the presence of exostoses in both external ear canals (Ludwig 1931) (Stoney, MacKay et al. 1991) (Yardley, Rutka 1998). In 1888, Schliemann experienced an episode of sudden hearing loss and intense otalgia, and Virchow identified severe swelling of the ear canal (Stoney, MacKay et al. 1991). Since the condition of Schliemann's ears continued to deteriorate, in early 1890 Virchow finally suggested that surgery might be necessary. In that case he recommended Prof Schwartze of Halle (Ludwig 1931), (Skoulakis, Papadakis et al. 2008), (Stoney, MacKay et al. 1991) (Yardley, Rutka 1998) who had introduced the antrostomy procedure in the early 1870s, and was considered the best otological surgeon of his time (Ludwig 1931) (Poole, L., Poole, G. 1966) (Skoulakis, Papadakis et al. 2008) (Stoney, MacKay et al. 1991) (Yardley, Rutka 1998).

Schliemann's conditions in 1890

During the last Trojan campaign, in 1890, Virchow witnessed another episode of rapidly-evolving deafness followed by severe ear pain, and found extreme oedema of the external ear canal (Ludwig 1931). Schliemann's account of his ear problems in his 1890 diaries regarding this last excavation campaign also gives a grim picture of those days.

On 19 May, while in Constantinople, Schliemann reports having visited a certain Doctor Von Mellinger, who said that the left auditory canal was obstructed by four exostoses, the right one by two, and that he would be able to perforate or dissect them. The doctor considered the operation rather dangerous and said that it should not be done in haste. He recommended operating on one side at a time. As Schliemann said he was busy with his excavations, the doctor advised him to return when he could take a six-week vacation (Schliemann 1890a).

On 1 June, Schliemann noted a gurgling sensation in his ear, followed by an improvement

in his hearing loss and tinnitus (Schliemann 1890a).

Although he was extremely annoyed by his conditions, particularly a rather severe hearing loss, he chose to continue the excavations until the end of July. Both his wife Sophia and his assistant Dorpfeld judged him too sick to continue, however, and on their advice, he decided to go back to Greece, where he did not rest but continued to work on his publications and reply to a mass of correspondence (Ludwig 1931) (Poole, L., Poole, G. 1966)

Meanwhile, his otologic problems continued with attacks of deafness and pain alternating with periods of symptom remission. A particularly severe episode in September (Ludwig 1931) (Poole, L., Poole, G. 1966) is what probably prompted Schliemann to opt for surgery (Ludwig 1931), and in October he started to prepare for his departure, including updating his will (Ludwig 1931) (Poole, L., Poole, G. 1966).

Observing Schliemann's attitude versus his condition as it transpires from his personal correspondence and reports from people close to him, what mainly afflicted him was not physical pain but rather the annoying sensation of disability and impotence given by deafness. Having Schliemann lived very hard times during his youth, he had learned to tolerate sufferings very well and, after a certain point, had almost a tendency to go in search of them by living in rough conditions during his voyages and his excavation campaigns and naturally through his constant habit to expose himself to ice-cold water during the winter. On the other hand, he had always had an attitude to command and the tendency to have control over everything around him and had also emerged as a great communicator, able to become intimate with important personalities and gain international consensus over his person and his work. Being able to hear and correctly understand what was happening around him was therefore, fundamental to him as he was still very active and was planning to lead further excavations at Troy. Moreover, he had to be able to correctly communicate at high levels in order to defend his work from fierce critics that had already emerged, first of all a certain colonel Boetischer that was discrediting Schliemann's theory that the ruins of Hissarlik were actual-

ly Troy, proposing other imaginative theories of his own. (Ludwig 1931) (Poole, L., Poole, G. 1966)

Surgery in Halle

Schliemann reached Halle alone in early November 1890 (Ludwig 1931) (Poole, L., Poole, G. 1966). As he writes in a letter to Sophia dated 9 November, Prof Schwartz was away and he was initially examined by an assistant (Schliemann 1890b). On his return, Schwartz examined him again and proposed an operation on both ears simultaneously (Ludwig 1931).

In Schliemann's own words, the operation on 13 November: "took place on a board covered with white oilcloth, resembling closely the tables on which dead bodies are dissected [...] When I was stretched on it, the chloroform soon brought forgetfulness of all earthly things, and made me so insensible that I knew nothing whatever of the operation, which lasted one and three quarter hours" (Ludwig 1931) (Schliemann 1890 b). The exact details of the procedure are not known because the operative report has been lost. Most of what we know on the matter comes from Schliemann's reports in his letters, which he resumed writing on 15 November. In a letter to Sophia of the same day he wrote that he had been told that Schwartz had easily dissected three exostoses from his right ear through the auditory canal. But the exostoses in the left ear were huge, making their removal from the thin skull bone extremely hazardous. This necessitated the removal of a part of the concha to gain a safer access, and a subsequent reconstruction. The operation was complicated by profuse perioperative bleeding and Schliemann admired how the professor had found his way into the ear through all the blood (Schliemann 1890b). Prof Jacobi, a past director of the ENT Clinic in Halle, reported having seen the operative report in the 1970s (before it was lost). In addition to bilateral exostoses, he believed that Schliemann had a cholesteatoma in his left ear and recalled it being mentioned in the report. He also seemed to recall that Prof Schwartz had only removed exostoses from the right ear, while he had been obliged to perform an antrotomy in the left (McGovern 1977),

The patient did relatively well in the immediate postoperative period (Ludwig 1931) (Poole, L., Poole, G. 1966). Though he was in great pain, Schliemann continued to work on his publications, and dedicated himself to his readings and his correspondence (Ludwig 1931) (Poole, L., Poole, G. 1966). His visitors were limited, not only on doctor's orders but also due to his deafness and pain (Ludwig 1931) (Poole, L., Poole, G. 1966). He seemed rather impatient and was irritated when the doctors told him the postoperative period would be long. The dosage of analgesics was consequently increased and he spent most of the day sleeping (Poole, L., Poole, G. 1966).

We can gain a general idea of Schliemann's conditions while recovering from the intervention from the letters he wrote to his wife and friends. He wrote to Sophia that on the tenth postoperative day he developed otorrhea from the left ear, accompanied by severe pain. Schwartz treated the otorrhea with carbolic acid irrigations (Skoulakis, Papadakis et al. 2008), (Stoney, MacKay et al. 1991), (Yardley, Rutka 1998). Schliemann was clearly aware that there were signs of his health being at great risk. He wrote to Virchow that the doctor believed that: "I should endanger my life if I travel before the pain disappears", and added that the doctor "does not know what is causing the pain, but he thinks that in the operation the periosteum must have been injured, and is inflamed" (Ludwig 1931).

By 10 December the pain in his right ear had partially subsided and Schliemann decided to leave the clinic, going against the doctors' advice and despite the continuing pain in his other ear. He was longing to be with his family for Christmas and could no longer stand being isolated at the clinic (Ludwig 1931) (Poole, L., Poole, G. 1966).

The long return journey towards Greece

Schliemann took a long trip around Europe on his way back to Greece (Ludwig 1931) (Poole, L., Poole, G. 1966). He headed first to Leipzig, where his editor Brockhaus had his headquarters, then to Berlin where he met Virchow and gave him a box containing bone fragments from his ears (Ludwig 1931) (Poole, L., Poole, G. 1966). On the way to Paris, the pain returned in his right ear and he wrote to Sophia from there to say that, though his con-

dition was not extremely worrying, he would seek medical advice before leaving for Naples (Ludwig 1931). The pain and deafness on the right side seemed to subside again, however, and - somewhat reinvigorated - he took the train to Naples, eager to see the latest archaeological finds in Pompeii before taking the ship back home in time for Christmas (Ludwig 1931).

Schliemann's last days in Naples

Schliemann arrived in Naples by train on 21 December 1890 (Poole, L., Poole, G. 1966). The pain in his ears had worsened and he decided to seek medical advice. His search for a specialist led him to Prof Vincenzo Cozzolino (Skoulakis, Papadakis et al. 2008) (Stoney, MacKay et al. 1991), then professor in charge of otology and pareggiato in rhinolaryngology at the University of Naples and author of numerous publications in the fields of rhinology and otology with a predilection for the later. (Felisati, Sperati 2005) Cozzolino had attended major clinics worldwide and he was intimate with the great Viennese master, Adam Politzer. He would later become Extraordinary professor of otorhinology at the University of Naples. (Felisati, Sperati 2005) Cozzolino briefly examined Schliemann's ears and appeared quite reassuring about his condition and when his patient expressed his wish to visit Pompeii, he offered to accompany him (Ludwig 1931) (Poole, L., Poole, G. 1966).

During the night, Schliemann experienced very severe ear pain and on the morning of 22 December decided to postpone his departure for Greece until after Christmas (Poole, L., Poole, G. 1966). As the pain seemed to become worse (Poole, L., Poole, G. 1966) he paid another visit to Prof Cozzolino, who could do nothing more than give him analgesics (Skoulakis, Papadakis et al. 2008) (Stoney, MacKay et al. 1991). On Christmas Day of 1890 Schliemann left his hotel, poorly dressed and in great pain, probably intending to pay a visit to Prof Cozzolino, but when he reached Largo della carità, he collapsed to the ground (Ludwig 1931) (Poole, L., Poole, G. 1966). Passers-by tried to help him but, as he was unconscious, they called the police. Schliemann was taken to a hospital where he was not admitted because he had no form of identification or money, and he ended up

at a police station, where he seemed to have regained consciousness but was unable to speak. A policeman finally found a piece of paper in his pocket with the address of Prof Cozzolino, who was called in and identified him (Ludwig 1931) (Poole, L., Poole, G. 1966). Schliemann was then taken back to his hotel, as witnessed by Nobel prize-winner Henryk Sienkiewicz (Sienkiewicz 1923).

Cozzolino called in Prof Von Schron, a German physician and professor of anatomical pathology at the University of Naples, who performed an incision in Schliemann's left ear, draining purulent material (Skoulakis, Papadakis et al. 2008) (Stoney, MacKay et al. 1991) (Yardley, Rutka 1998). Schliemann passed the night in agony, reportedly with a right-sided hemiplegia (Ludwig 1931). Next morning eight of the most illustrious clinicians in Naples were at his bedside, including Professors Cardarelli (internal medicine), D'Antona (surgical pathology), D'Urso (surgery), and Von Schron (Ludwig 1931) (Poole, L., Poole, G. 1966) (Cozzolino, 1894). After examining the patient, the doctors discussed what therapeutic strategy they might adopt (Ludwig 1931) (Poole, L., Poole, G. 1966). Von Schron recommended cranial trephination as he believed the infection had already spread deeper into the skull (Skoulakis, Papadakis et al. 2008) (Stoney, MacKay et al. 1991) (Yardley, Rutka 1998). The group eventually reached an agreement over this procedure, but when they returned to Schliemann's room they found him dead (Ludwig 1931) (Poole, L., Poole, G. 1966) (Skoulakis, Papadakis et al. 2008) (Stoney, MacKay, et al. 1991) (Yardley, Rutka 1998).

Cozzolino gave a slightly different version of the facts at the Eleventh International Medical Congress held in Rome in 1894, in a discussion regarding otogenic cerebral disease. Cozzolino explained that Schliemann had come to his consulting room in Naples on 23 December 1890 with severe suppuration from his left ear. He said the patient had not wanted to give him his name and address, and this had worried him extremely because he wanted the patient to remain in his room and consider himself seriously ill. Cozzolino also said that Schliemann was found in the streets of Naples some distance from Cozzolino's home, half paralysed and with paralysis

of the tongue, at 8 o'clock on 24 December. He was picked up by a police inspector and brought to the Grand Hotel, where he was recognized. Cozzolino reached Schliemann at his hotel and, on discovering who the patient was, he immediately summoned his colleagues Cardarelli, Schron, D'Antona and D'Urso for a consultation. They all agreed to cranial trephination to rid the brain of pus, but the patient's death cut the matter short. (Cozzolino, 1894) Cozzolino's version mentions no personal contact with Schliemann or a ride to Pompeii. However, it offers an imprecise timetable of the events, bringing Schliemann's collapse in the street to 24 December, and his death to December 25 at the latest, whereas the official records indicate December 26 as the date of Schliemann's death.

Epilogue

Schliemann's body was probably embalmed and shipped to Greece (Poole, L., Poole, G. 1966). There are no records of any autopsy taking place. He had a state funeral on 4 January 1891, in the presence of King George I of Greece, representatives of all great nations, and much of the Greek social and cultural elite (Poole, L., Poole, G. 1966).

Discussion

Analysing the accounts of Schliemann's last hours together with his early and later medical history, it is easy to identify the nexus between his chronic ear disease, his recent ear surgery and his death. Loss of consciousness, aphasia, and paralysis are typical of several disorders of the central nervous system, but the patient's known chronic otologic condition and a recent surgical procedure in the pre-antibiotic era, combined with the purulent discharge on Prof Von Schron's incision, make a left temporal bone abscess the most likely cause of Heinrich Schliemann's death although, oddly enough, fever was never mentioned (Ludwig 1931) (Poole, L., Poole, G. 1966) (Skoulakis, Papadakis et al. 2008) (Stoney, MacKay, et al. 1991) (Yardley, Rutka 1998). The type of infectious agent involved, and the way in which it spread through the temporal bone are less easy to decipher, however.

Schliemann had an obsession for bathing in the sea in all seasons of the year. The link between exposure to cold water and the formation of exostoses is well documented. The presence of exostoses gives rise to the accumulation of cerumen and debris in the external auditory canal, and this facilitates the onset of chronic otitis externa, especially when combined with exposure to sea water. The causative agents are usually *Pseudomonas aeruginosa* spp. Chronic otitis externa is characterized by intermittent ear pain and hearing loss due to swelling and occlusion of the external auditory canal, symptoms of which Schliemann clearly suffered. The infection is usually confined to the external ear, but may occasionally become invasive, involving the bony canal and causing necrosis, as in the potentially lethal malignant otitis externa usually associated with diabetes and immunodeficiency.

Chronic otitis media is not generally associated with any external ear disease. In the case of otitis externa due to exostoses, however, a causative factor common to both conditions is exposure to cold water, which is linked to both exostosis formation and nasal and middle ear inflammation. Schliemann's frequent febrile attacks may have been related to an upper airway disease that also involved the ear. The gargling sound on forced air emission that Schliemann mentioned in his diary on 1 June 1890, is more consistent with middle ear disease (and possibly a non-intact membrane) than with mere otitis externa.

A well-known way in which infection may spread into the temporal bone is through surgical procedures. Years before the operation in Halle, a surgeon in Java (of doubtful ability in the otologic field, given the time and setting) may have damaged the tympanic membrane. In addition to allowing the infection to spread inwards and enabling epithelial debris to enter the tympanic cavity, this may have also caused an interruption in the tympanic annulus, leading to invasion of the middle ear by skin from the external canal – thus providing the usual matrix for a cholesteatoma.

The Schwartze procedure was performed in a severely infected area, prior to the introduction of antibiotics in clinical practice, making some degree of contamination of the underlying structures inevitable. The use of carbolic

acid as an antiseptic would be unable to control such a massive, long-standing source of infection as the one in Schliemann's ears. The surgical procedure in the left ear was unquestionably complex and hazardous, as demonstrated by the need for a retroauricular incision and by the profuse bleeding. Removing large exostoses with the instruments in use at the time may have eroded the walls of the ear canal, thereby allowing the infection to spread to contiguous structures.

It is not entirely clear whether Prof Schwartze actually performed mastoid surgery in Schliemann's left ear. It may be that the retroauricular incision required to manage the extensive exostoses in the left ear prompted Prof Jacobi (decades after seeing the original operative report) to erroneously recall the procedure as a mastoidectomy. Even if there really was a cholesteatoma, it might have been in the canal wall, deriving from epithelial debris trapped between the exostoses, as sometimes described in cases of canal wall exostoses and osteomata (Yadav, Gulia et al. 2008). In any case, the procedure the Schwartze had invented and used to perform was merely an antrotomy, which could not guarantee a good exposure and toilette of the mastoid cavities and attic (Sunder, Jackler, Blevins et al. 2006). It would have been very difficult for Schwartze to identify and eliminate a tympano-mastoid cholesteatoma, which would subsequently have been able to spread further through the thinned bone. There is also the possibility that manoeuvres in the mastoid under poor lighting and without any magnification damaged the sigmoid sinus, accounting for the profuse haemorrhage and providing another route for the intracranial spread of the infection.

Regarding Schliemann's chances of recovery from a cerebral abscess, despite the lack of antibiotics in that period, Sir William McEwan's works prove that, had a diagnosis been timely made, even with a crude and primitive procedure such as trephination (already in use in prehistoric cultures) there would have been a rather high probability of survival (Canale 1996). Unfortunately, the sequelae of this type of pathology and surgery were then, and still are even in our days, frequently dreadful for the patient's subsequent quality of life.

Another major point worth of analysis is Schliemann's motivations over the decision to have his ears operated and his behaviour on the postoperative period. Both find an explanation in his character and lifestyle. Having always been a man used to face problems directly and resolve them quickly and efficiently, Schliemann was eager to resolve his ear problem which impeded him from living and working mainly through the handicap caused by hearing loss. As mentioned physical suffering was never a major concern to him so he chose the moment for the operation based on his thick work schedule and not on his general conditions that seemed to have started to deteriorate long before. This same capacity to tolerate pain and his will to go on with his life that was still full of activities and duties, as soon as possible, was also the cause of his premature departure from the Halle clinic against the opinion of his physicians.

Convincing the patient to be cured in the correct manner and time is a common problem to all doctors who have to deal with persons of strong character and especially celebrities and people that have an attitude to command and have the final decision over everything. Virchow despite his fame and the influence that he had on Schliemann did not manage to make him focus on the severity of his disease and that the operation was to be taken seriously. Even when facts clearly indicated that he was facing a life-threatening (situation in the post-operative period and despite his admiration for Schwartze he chose to impose his own will and head back home rather than trying to force himself to obey to the doctors' indications and continue to be cured.

Conclusions

Heinrich Schliemann's resolute character led him to become extremely wealthy and one of the most famous people in history, but his obsession for bathing in cold seawater made him suffer from chronic otologic disorders that led to his death as a result of a cerebral abscess not long after a surgical procedure undertaken more to face the disabling hearing loss rather than the physical illness itself and that, combined with his unwilling-

ness to follow his doctors' indications, instead of solving his problem, most probably precipitated his demise.

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