Approach to Painful Disorders by Şerefeddin Sabuncuoglu in the Fifteenth Century Ottoman Period

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Modern medicine is the culmination of the efforts of millions of people and tens of different civilizations, some known and others not. In the period between the ancient civilizations of Egypt, Greece, Rome, Persia, and India and the Renaissance period in Europe, the knowledge of medicine was kept alive and further developed by the Arabs and Muslims. 1 The nomenclature, the Dark Ages, reflects the state of civilization in Europe between the fourth and thirteenth centuries, but not that of the Islamic world, where science was loved and respected. 2 During this time, while the only Western center of secular medical practice was in Salerno, clinician-scholars such as Sabuncuoglu were among a cadre of Islamic physicians skilled in the practices of medicine that remain at the forefront of pain management practice even currently.

Şerefeddin Sabuncuoglu lived during the fifteenth century in Amasya, a small city in what is now central Anatolia. 3 During the early period of the Ottoman Empire, Amasya was a center of commerce, culture, and arts. When it became a center of tradition and was assigned a governor, the city also became architecturally enriched with the building of numerous new mosques, schools, inns, bridges, and fountains. Many scientists and artists were raised in Amasya during this time as well as afterward. 4 During this period, Şerefeddin Sabuncuoglu practiced medicine in the Amasya Hospital, which was built in 1308. In 1465, at the age of 80 years, he wrote a book called Cerrahiyyet'ül Haniye (Imperial Surgery), the first illustrated, Turkish-written, Islamic surgical textbook. 4 The book was rediscovered in 1936 by Süheyl Ünver, a Turkish medical historian, and the illustrations were published in a separate volume. 5 There are three original handwritten copies, two in Istanbul, in the Fatih Millet Library and the Çapa Medical History Department of Istanbul University, and one in the Bibliothèque Nationale in Paris. Each copy differs somewhat from the others, and none is complete. 6–8 Cerrahiyyet'ül Haniye consists of three chapters, although there is no strong separation of the subjects in the chapters (Treatments with Cauterization, Surgical Procedures, and Fractures and Dislocations). A total of 191 topics are covered in 412 pages. These surgical procedures relate to obstetrics and gynecology, ophthalmology, and general, pediatric, thoracic, orthopedic, urologic, neurologic, and vascular surgery. Invasive pain management information is presented in small parts in all of these surgical chapters. Şerefeddin Sabuncuoglu’s other books, Muçerrebname (The Book of Experiences) and the translation of Akrabadin (Medical Formulas), are the other two famous examples of his known seven books. 4 Muçerrebname is the first Turkish experimental textbook. Its 17 sections discuss almost all subjects of medicine. Sabuncuoglu reported many mixtures consisting of herbal drugs for pain treatment in Muçerrebname, a general medical experiment catalog that contains more than 20 pain-related sections 9 about the preparation of drugs, used experimentally on animals, patients, and author himself. In one example, he allowed himself to be bitten by a venomous snake and then drank a self-prepared potion to measure its effectiveness. Sabuncuoglu used a language similar to that of the contemporary medical literature for presenting case studies when he discussed the applications of drugs. Therefore, the author’s objective was to eradicate all suspicions about applying medication and to guide his colleagues—perhaps the first example of evidence-based medicine. The handwritten copies of the book are now housed in the Süleymaniye Library in the sections of Fatih, Ayasofya, and Kılıç Ali Paşa.

Sabuncuoglu operated throughout the human body well before the development of sterile technique and anesthesia, at least by modern standards. He used a combination of mandrake root and almond oil for analgesia and general anesthesia, 9, 10 but it is apparent that his knowledge was based on the conventional herbal medicine therapies of Anatolia. 11 In ancient medicine, some plant derivatives, including alcohol, cannabis, mandrake, and opium, were used to alleviate pain. 12 For example, the Romans had a widespread interest in mouth care using toothpicks, mouthwashes, and pain-relieving remedies. 13

Sabuncuoglu’s textbook Cerrahiyyet'ül-Haniye was dedicated to Sultan Mehmed the Second (The Conqueror), the great Ottoman emperor. The book was a
modification of, with original contributions from, *al-Tasrif (Textbook of Surgery)* of Abu al Qasim Khalaf Ibn’Abbas Al-Zahrawi (Albucasis; 936–1013 AD). The author translated the last three chapters of *al-Tasrif*, which has a total of 30 chapters. However, there are 137 different medical observations and recommendations from Sabuncuoğlu, along with translated passages from the works of al-Zahrawi. al-Zahrawi’s *al-Tasrif* was the most important surgical book of his time and has influenced the East and the West for centuries. al-Zahrawi used the surgical text of Paul de Agene, but he added another aspect to his book by drawing and describing the surgical instruments. This not only educated medical students in the art of surgery, but it also gives us insights into the surgical operations of the time. Sabuncuoğlu read and referred to the books of previous masters, following the tradition of fifteenth century Muslim scholars. Therefore, he used the surgical chapters of *al-Tasrif*, but he added his experiences and observations to his book. For example, although there was no information about back pain in the cauterization section of *al-Tasrif*, Sabuncuoğlu wrote a separate section for it in his book. In addition, Sabuncuoğlu drew surgical instruments (with his own additions) and doctor–patient figures to demonstrate specific procedures. These illustrations are unique in Islamic medical history and medical history in general.

Despite his merits, Sabuncuoğlu was not widely known, even in his own era, and his book was ignored until the 1930s, perhaps in part because it was written in Turkish rather than Arabic or Persian, the scientific languages of that time. Although his miniatures do not have great artistic value, it is important to emphasize that they were drawn in a modest but serious spirit according to Islamic rules. (It has generally been believed that in the Islamic world, painting, especially the painting of human figures, was discouraged. However, it is argued that prophet Muhammad did not ban painting himself—it was only the interpretation of some religious scholars after the ninth century.) In his other book, *Mücerrebname*, Sabuncuoğlu mentioned that he performed innovative procedures first on animals, then on himself, and finally on his patients.

In *Cerrahiye’ül Haniye*, Sabuncuoğlu described various painful conditions, including headache, pain of sinusitis, sciatica, cold pain, and pain of the eye, tooth, throat, and back. Because the influence of Ibn-i Sina (Avicenna; 980–1037 AD) and his medicine was very strong on Ottoman medicine at that time, Sabuncuoğlu first suggested treating these pains by *materia medica*, medicines obtained in mixtures of various herbs and their products. These medicines were in forms of medicated taffies, creams, pomades, plasters, ointments, lotions, and oral preparations. He used taffy prepared from a mixture of *Afyon* (*Fructus Papaver somniferum*), *Akbenc* (*Hyoscyamus albus*), *Ferfiyun* (*Euphorbia*), *Zerdecube* (*Curcuma longa*), *Sünbül* (*Hyacintbus*), *Akurkarba* (*Herba Anacyclus pyrethrum*), *Suruncan* (*Colbicicum autumnale*), *Hamama* (*Amomum race mosum*), and *Dar-i Fülfül* (*Piper langum*) for relieving general pains as a systemic analgesic. Although Sabuncuoğlu did not etiologically classify headaches, he described sinusitis-induced headaches and migraine as half-side head pain. He also suggested the use of a paste consisting of a mixture of *Asel* (*Mel*), *Mazaryun* (*Daphne mezereum*), and *Kükürd* (sulfur) or an ointment consisting of rose water, opium, and *Zaferan* (*Crocut sattius*) for the medical treatment of headaches. If the pain could not be treated adequately or had been characterized as chronic headache, he suggested applying heat cauterization on a certain region of the cranium. For sinusitis-induced pain, he recommended that patients treat their feet with a plaster-smeared medicine that consisted of *Bezir-i Sedab* (*Herba Ruta graveolens*), *Raziyane* (*Semen Foeniculum vulgare*), and *Kinna* (*Lau sonia inermis*). If the patient still experienced pain, he recommended that the scalp above the point of the biparietal junction be cauterized until cranium bones were seen. However, he warned his students to avoid burning the bones (fig. 1).

Sabuncuoğlu described migraine as the pain affecting...
one side of the head, and the book describes its surgical management. An interesting treatment method presented in the fourth section of chapter I is the treatment of chronic migraine by sectioning of the superficial temporal artery. Sabuncuog˘lu described an incision starting from the pterion, extending just ventral to the ear, and ending at the ear lobe; he also explained how the superficial temporal artery is identified, coagulated at both ends, and sectioned after coagulation. This indicates that he knew the vascular origin of the pain. With the influence of the teachings of Galen, it had been believed that pain was always related to nerves, with no reference to the vascular system. Although this seems quite a novel application during that age, the treatment is identical to that described in al-Tasrif by Zahrawi.

In Miiccerrebname, Sabuncuog˘lu advised patients with dental pain to rinse or gargle with medicines prepared from Kızıbere-i yabise (Fructus Coriandrum sativum), Akırkarba (Herba Anacyclus pyrethrum), Mевизаç (Delphinum staphisagria), and Zencebit (Zingiber officinale). He said, “If the pain persisted and could not be treated by any medicine then heat or medical cauterization is indicated. Cauterization should be applied on the fissure of tooth”⁴ (fig. 2).

In the forty-second section of chapter I of Cerrabtvel-i Hamiyye, Sabuncuog˘lu gave some sources of back pain and their treatment. He said, “Sources of back pain may be trauma, collapsing, vomiting, and/or straining of the back.” He also suggested treating it by using analgesic medications prepared from Karanﬁıl (Caryophyllus aromaticus), Sümbül (Hyacintus), Sadeca bindi (Melastoma), Miaça Yabise (Strax officinale), Üşne (Moscus arboresus), Irasa (Herba Iris fiorentina), Kust (Costus speciosus), Raşen (Inula Ibelenium), and Belesan yağı (Commiphora opobaumum). If the patient was still chronically distressed after the medication, the point of pain was marked with ink, and then cauterization was performed in accordance with the patient’s strength (figs. 3 and 4).

Sabuncuog˘lu discussed sciatica in section 41. It was described as a leg pain, and the main causes were defined as cold and humidity. The medical therapy of sciatica was a mixture composed of Döbni’l Kari (Pavonia Arabica), Bevti’n-Nisa (Usina Feminae), Mamısa (Chelidonium majus), Şem-i Musaffa (Ceraflava), Ayvon (Fructus Papaver somniferum), and Zafere (Crocos sativus). In intractable sciatica cases, cauterization was recommended to be performed in two ways, either by medicine or by heat. For medical cauterization, a round device (copper or iron) was used, and the patient was positioned in the lateral decubitus position. The round cauterization device was placed on the painful area, and the special cauterizing medicine was applied. After at least 1 h, this area was washed with fresh water, and this cleansing procedure was continued for 3 days. Special creams were also used. According to the author, heat cauterization could be performed with iron or wool. In heat cauterization with iron, the physician used his thumb to locate the painful area (fig. 5). After localization, three points, like a triangle, were marked around the painful area, and a fourth point was located at the center of triangle. All of these points were cauterized. Two points on the thigh...
and one point on the leg were also suggested to be cauterized, but because of the risk of damaging vessels and nerves, it was advised not to do it too deeply in the leg. Sabuncuoğlu said, "I remember such complications reported by experienced physicians. I also remember such complications reported by inexperienced physicians. In heat cauterization with wool, the mixture of wool and medicine are heated and placed on painful area. This procedure shall be repeated several times."

Sabuncuoğlu described two types of cauterization tools, made of iron and gold, that were specially designed for these applications. The tips of the cauterization tools were in various shapes, such as round, pin, sharp, point, olive, triangle, crescent, and nail (fig. 6). Gold was mostly preferred because it prevented post-cauterization infections, but it was not suitable for warming because the tools often melted after rewarmed. Therefore, Sabuncuoğlu reported that he preferred iron, despite its higher infection potential. This shows that Sabuncuoğlu was conscious of the balance of risk and benefit. As a responsible scholar and educator, he frankly described the positive and negative aspects of each technique and tool so that the following generations would not be misled.

Sabuncuoğlu stated that heat cauterization was necessary as a last resort for pain management because this method had a potential risk for complications. He implied it with his own words: "If you want to make a cautery, first you have to be an experienced physician about cauterization. If you are not, you may lead a serious complication for the patient." He discussed cauterization in detail in Cerrabiyet’ül Haniyye. Despite the disagreement of some contemporary authors, he recommended cauterization as an effective method of chronic pain treatment. The opponents’ claim was that the pain could be aggravated by cauterization or even to be spread to another part of the body. As a response to this, Sabuncuoğlu wrote that "we have no doubt about usefulness of cauterization, if the indication is correct." It was recommended that the patient’s strength, appetite, age, and impairment be considered before cauterization. He said, "Although some authors are proposing the selection of season for cauterization is important, our experience has taught us that cauterization can be applied successfully in every season." Eventually, he argued that herbal treatment combined with cauterization had maximal treatment potential. It is possible to observe here that Sabuncuoğlu emphasized a kind of multimodal therapy. The combination of medicines and invasive techniques are successfully performed and well received in contemporary pain management.

Currently, a wide range of invasive techniques are available for pain management. Radiofrequency ablation has also been performed for pain treatment in modern medicine. Would it be incorrect to consider radiofrequency ablation as an invasive neural burning technique?

When we look at Sabuncuoğlu’s work from a modern perspective, his applications seem old-fashioned and irrational. These applications were not only revolutionary for his time but are also valid at present. In modern pain treatment, the treatment must be adapted to the severity of the underlying disease and the intensity of the pain. Optimal effectiveness is obtained if the indication is correct. Sabuncuoğlu’s illustrative studies undoubtedly contributed to medical education. He frankly disclosed the problems he faced during his surgical practice and did not hesitate to criticize himself or to cite his senior masters, Galen (129–210 AD), Hippocrates (460–370 BC), and al-Zahrawi. He taught not only his opinion to his students but also his opponents’ claims. Sabuncuoğlu recommended that surgeons mark the surgical area, reflecting his systematic approach to the surgical process. He thought that the intervention itself was only one part of the treatment and therefore recommended postoperative medical treatment in the form of ointments and soils.

Cerrabiyet’ül Haniyye describes diagnosis and invasive techniques for the management of pain and also the

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Fig. 5. Cauterization for treatment of sciatica.

Fig. 6. Some samples of cauterization tools of Sabuncuoğlu in his fifteenth century textbook: Zeytuni (olive; A), nail (B), triangle (C), sharp (D), crescent (E), and round (F).
treatment of many diseases with an illustrative method. *Mücerrebname* focused on medical treatments of various diseases. In these books, Sabuncuoğlu advocated the treatment of pain step by step, from noninvasive to invasive procedures. Currently, this approach is widely accepted in modern medicine. The lack of significant progress in medical knowledge could be expected in the Dark Ages; pursuing that knowledge was well worth the struggle.

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