

Thoracic Surgery Techniques of Şerefeddin Sabuncuoğlu in the Fifteenth Century

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Şerefeddin Sabuncuoğlu (1385 to 1470?) is known to be the author of the first surgery textbook, namely *Cerrahiyyet'ül Haniyye* (Imperial Surgery), written in Turkish in 1465. It is the first book to contain colored illustrations of surgical procedures, incisions, and instruments in the Turkish-Islamic medical literature. He was the first man to illustrate and mention introduction of a tube into the pharynx and upper esophagus, removal of foreign bodies in the esophagus by special instruments of his own

design, and use of a silver ringlet in a man after tracheotomy. He also described and illustrated reduction of sternal fractures, thoracic puncture through the intercostal space for drainage of empyema cavities, and treatment of rib fractures that have severed the diaphragm. He was a humble, curious, and intelligent surgeon, and also a calligrapher and a miniature artist.

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The path of modern thoracic surgical development in Western civilization has been published in a detailed book by Andreas P. Naef [1], but the techniques used before the modern age are not well known. Turkish medical history reveals Şerefeddin Sabuncuoğlu (1385 to 1470?), a famous Turkish surgeon who lived in the fifteenth century. He wrote *Cerrahiyyet'ül Haniyye* (Imperial Surgery), the first illustrated surgical textbook in the Turkish-Islamic medical literature, in 1465 at the age of 80 years [2]. The book consists of three chapters of 206 pages about cauterization techniques for various diseases, general surgical treatments, and treatment of fractures and dislocations. The importance of his book is that nearly all the surgical procedures, incision techniques, and instruments are illustrated in color miniatures drawn by Şerefeddin Sabuncuoğlu himself. The book was first noticed by Prof Süheyl Ünver in 1936, and its illustrations have been published in a separate book [3]. The book has three known copies. Two copies were originally written by Şerefeddin Sabuncuoğlu and one copy was written later in the eighteenth century [4-6].

About the treatment of pleurisy (Fig 1), after explaining the technique of cauterization, he said, "... one should take an iron cauter and shape it like a thick wire; heat it and from the place we have cauterized, between the fifth and sixth ribs, one should perforate until he reaches the inside of disease and pus should come out. This action may not be of any harm, or in some the patient dies within that hour...".

To remove foreign bodies in the upper esophagus (Fig 2) he had a special technique: "... Expose the throat to sunlight. Shape an instrument from strontium [Fig 3, 2] [and] put the instrument in his throat but take care not to

touch the larynx so that he should not cough... I have seen a person who had a bone in his throat for 3 days and nights; I took a strontium wire, made one side hooked, the other side ringed, and put my finger to the ringed side, placed the hooked side to the patient's throat, hung the bone with the hooked side, and pulled. The bone broke from its place and he was saved, with the permission of Allah."

He used nebulization to treat adhesion of leeches (blood-suckers) into the esophagus, which were commonly aspirated or swallowed due to their use in oral and facial diseases at that time (Fig 3, 1). If the leech can be seen "... take a hook or a small grasper, keep it tough and pull out. Insert the angled side to the patient's throat; the tip of the instrument should be like a file and should not release the thing it grasps..." (Fig 3, 3, and Fig 4). Later he described a technique to reach even more distal parts of esophagus: "... take a hollow tube. Insert it into the patient's throat and take a heated iron wire; insert it into this tube to reach the leech..."

He emphasized that the tracheotomy should be done between the second and third cartilages and the trachea should be cut vertically (Fig 5). After mentioning a case that necessitated tracheotomy he stated that "... somebody came to me in the bazaar, kissed my hand, and greeted me; he smiled at me and lifted his head. Looking at his neck I saw that he had a silver ringlet on his neck and he was taking his breath from that coming out like a bird's cry. I understood that he was the man I treated..."

For the treatment of sternal fractures he recommended lying the patient on a hard wood plate and having two persons press down the thorax from two shoulders and lateral ribs while the physician places the fracture in its appropriate position (Fig 6). He explained the treatment of complicated rib fractures as follows: "... if the broken rib severs the diaphragm or other structures, you should incise the wounded region and with the instrument

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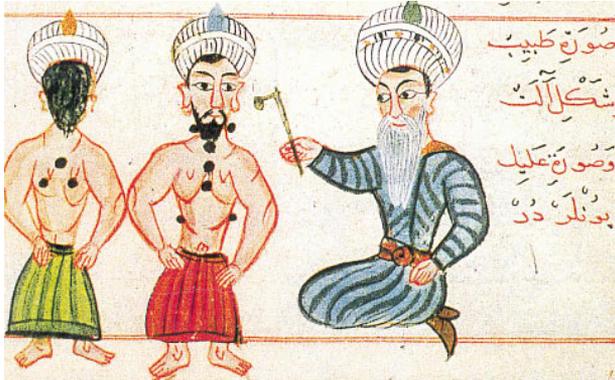


Fig 1. Şerefeddin Sabuncuoğlu applies cauterization for the treatment of pleurisy. The black points on the patient's front and back view are the sites he uses. He makes the thoracic puncture for empyema from the points on the lateral side of the patient.

[Figure 3, 5] . . . elevate the broken edge of the rib and cut its end with one of the bone curettes suitable for the region [Fig 3, 4], then you should suture the wound. . ." (Fig 7).

Comment

The techniques Şerefeddin Sabuncuoğlu mentioned were well advanced for that time when no sterility and anesthetic management existed in a modern manner. He used a combination of mandrake root and almond oil as a general anesthetic and an analgesic [7, 8].

The drainage of empyema cavities dates back to Hippocrates, but Şerefeddin Sabuncuoğlu explained the procedure in a detailed manner and with anatomic evaluation. He advised this technique in the last choice as his experiences showed that some patients die within that hour after the procedure (probably the ones who did not have any adhesions!). He had a sharp-ended special cauter and a thin wire for puncture and drainage. In that era, to diagnose and to drain exudative pleurisy shows the level of anatomic knowledge and surgical experience.

His attempts to take out foreign bodies like bone, leech, and others can be regarded as a primitive appli-



Fig 2. Şerefeddin Sabuncuoğlu introduces the hook to the patient's throat to extract the foreign body. The assistant holds the patient's head.

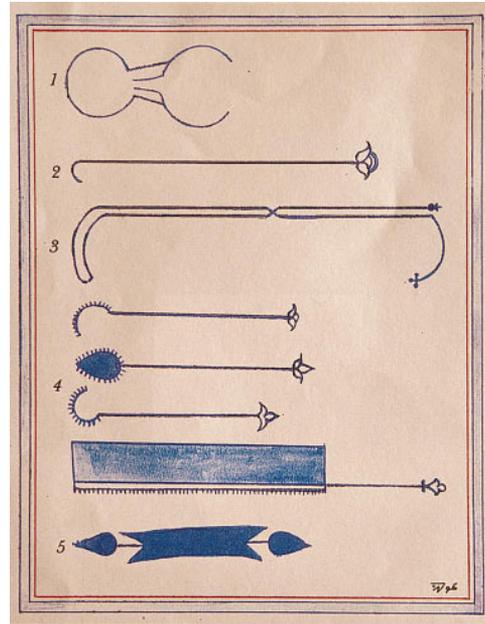


Fig 3. The instruments Şerefeddin Sabuncuoğlu used in his thoracic surgical procedures. (1) A primitive nebulizer in which a plant smoke or water vapor can be produced. (2) The hook used to extract bone and other foreign substances that have become attached in the upper esophagus. (3) The clamp used to extract a leech from the upper esophagus. He notes that the tip should be like a file. (4) Four types of bone cutters and curettes used to cut edges of broken ribs. (5) The instrument used to pull out the broken side of the rib and the clavicle. (Illustration drawn by Prof Süheyl Ünver.)

cation of esophagoscopy. The instruments for extraction of foreign bodies were of his own design (Fig 3, 2 and 3). He also used the tube technique for other diseases (in abdominal and otorhinolaryngologic procedures).

His mention of a tracheal silver ringlet is before Vesalius, who explained the use of a tracheal cannula in animals to ventilate the lungs [9, 10]. Use of a tracheal cannula or ringlet is an important step toward understanding the respiratory physiology. The text gives clues that this silver ringlet may be a tracheal cannula rather

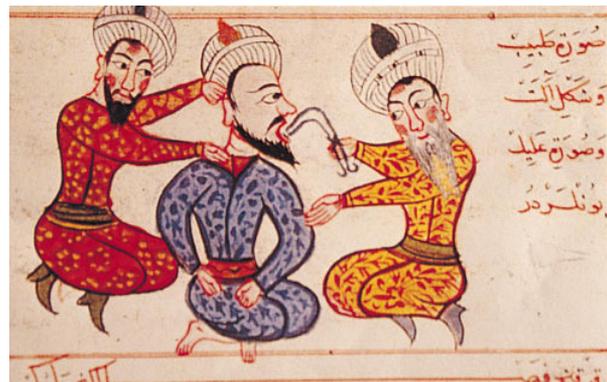


Fig 4. Şerefeddin Sabuncuoğlu introduces the angled clamp to the patient's throat to extract the leech. The assistant holds the patient's head.



Fig 5. Şerefeddin Sabuncuoğlu tries to open a tracheotomy. Note that the patient's throat is swelled and bleeding.

than a ring, because the patient is described to be unable to talk and was breathing from the ringlet like a bird's cry.

Şerefeddin Sabuncuoğlu also used a modern approach to stabilize sternal and rib fractures externally. He said in most parts of his books that he performed therapeutic trials first on animals and then on himself and finally on the patients [2].

He felt free to mention his faults and he cited other writers from whom he obtained knowledge such as Hippocrates, Galen, Albucasis [11], and many other authors of that age of whom we are not informed today. Roman, Greek, Arabic, and Turkish medical knowledge therefore are expressed and mixed in this splendid work. His pediatric surgery techniques in *Cerrahiyyet'ül Haniyye* have been published, and he is also known to be one of the first pediatric surgeons in the world [12, 13].



Fig 6. Şerefeddin Sabuncuoğlu tries to reduce a sternal fracture with two other assistants who push the two shoulders and lateral parts of the ribs down.



Fig 7. Şerefeddin Sabuncuoğlu approaches the patient with a complicated rib fracture with instrument 5 in Figure 3.

He was a great man of Turkish-Islamic medical history, as well as of the world medical civilization, and still should be remembered after 600 years.

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