

FACIAL SURGERY IN THE ANCIENT WORLD

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Smith Papyrus

In ancient Egypt, medical papyri have attested the practice of medicine for more than 3000 years BC. Among these papyri, the so-called Edwin Smith (circa 1600BC) is the only one that deals explicitly with surgical treatments following trauma. Thanks to the deciphering of hieroglyphs by scientists like Champollion and Breasted, and more recently James P. Allen of the Metropolitan Museum of Art in New York, we have access to 48 case-stories of trauma with a description of the physical examination, diagnosis, treatment and prognosis. Most of the cases deal with head and facial fractures and wounds. As an example, one finds in case number 12 the following statements: (Fig. 1)

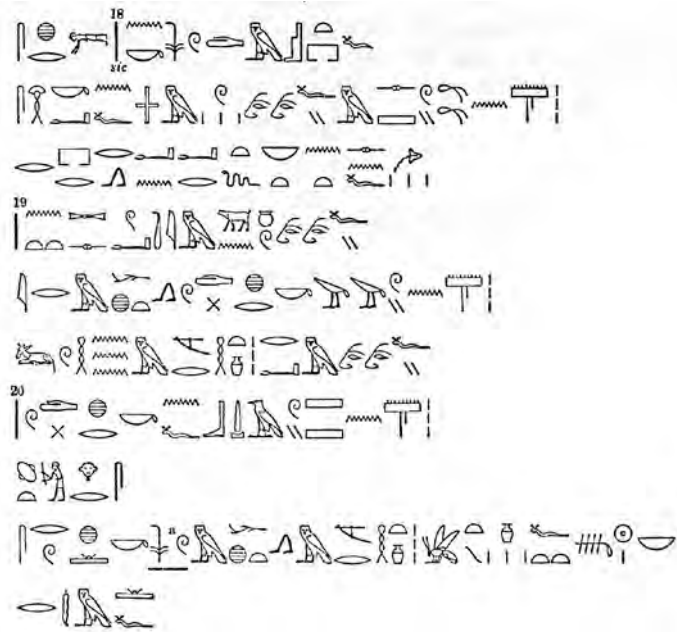


Fig. 1: Hieroglyphic description of Case No 12 (Nasal fracture), Smith Papyrus (c. 1600 BC)

Translation:

If thou examine a man having a break in the chamber of his nose, (and) thou findest his nose bent, while his face is disfigured, (and) the swelling which is over protruding: Thou shouldst say concerning him: "one having a break in the chamber of his nose, an ailment which I will treat." Thou shouldst force it to fall in, so that it is lying in its place, and clean out for him the interior of both his nostrils with two

swabs of linen until every worm of blood which coagulates in the inside of his nostril come forth. Now afterward thou shouldst place two plugs of linen saturated with grease and put into his two nostrils. Thou shouldst place for him two stiff rolls of linen, bound on. Thou shouldst treat him afterward with grease, honey, (and) lint every day until he recovers.

Thanks to the US National Library of Medicine, everyone may nowadays consult and unroll the papyrus online and see its entire translation.

Alexandria

Thirteen centuries later, it is undoubtedly in Alexandria where, at the end of the 4th century BC, surgical procedures can be ascribed to physicians of renown who had experimented and described them. The most famous among them are Herophilus and Erasistratus, who were both reputed to have studied human anatomy, particularly by dissecting human corpses and through animal vivisection (notably Erasistratus). Hierophilus was born in Chalcedon on the Asian shores of the Bosphorus. Before moving to Alexandria at around 320BC, he had studied under Praxagoras and was, therefore, a disciple of the Hippocratic School of Kos. He was particularly interested in the nervous system, describing the brain cells and the cranial nerves. Erasistratus was born on the Island of Chios and was a follower of the School of Cnidus. He devoted himself to the study of the heart, blood circulation and the lymphatic system, describing the tricuspid and mitral valves and suggesting that the body was composed of minuscule particles – a premonition of animal cells?

They were both precursors of medical procedures that were to be followed throughout the following centuries by the schools named after them. In fact, many other practitioners studied and stayed in Alexandria to perfect or to practice their art and were classified according to their allegiance to their original mentors. Although their writings have mostly disappeared, the operating procedures attributed to them, first of all by Celsus, but also other famous representatives of Greek surgical knowledge between the 2nd and 7th centuries AD, such as Galen, Soranus of Ephesus, Oribasius, Aetius of Amida or Paulus Aegineta, have survived. Others, whose biographies are not known, for instance Leonidas, Heliodorus, Megues or Antyllus, were important innovators in

the field of reconstructive surgical methods, urology and ophthalmology. Antyllus was even referred to as "the greatest surgeon in Antiquity." Undoubtedly, the working conditions, the freedom to make autopsies, and the rulers' ambitions combined to make Alexandria the cradle of the best surgeons of antiquity.

Celsus (c. 25BC – c. 50AD)

Aulus Cornelius Celsus was a Roman writer, known for his medical treatise, *De Medicina*, which is believed to be the only surviving section of a much larger encyclopedia. The *De Medicina* is a primary source on diet, pharmacy and surgery and related fields of its time, and it is one of the best sources concerning medical knowledge in the Roman and Alexandrian world. Although Celsus was certainly not a surgeon, his detailed descriptions of surgical methods are overwhelming and are certainly translations in Latin from lost writings from famous Greek Alexandrian surgeons. For instance, Celsus describes an autoplasty to repair facial defects: "The restoration is not effected by using foreign bodies, but by drawing on the area close to the injury and pulling it closer. . . ." The technique is recommended for the reconstruction of facial injuries (ear, nose, lips, eyelids):

One begins by outlining a square on the injured area; then, starting from the corners on each side, two transversal incisions are made to completely detach the epidermis from the lower layers. This done, one tries to rejoin the two pieces of skin; if they do not meet completely, two additional crescent-shaped incisions are made behind the first, their points pointing towards the wound. To join the pieces, no force is needed and the skin should respond to gentle pulling. Sometimes, an area remains that is not fully covered; in that case, one should complete the incision made on one side without touching

the other. To close the cuts, the two edges of the wound are superposed and sutured; the first incisions are closed in the same manner. Concerning the second incisions in the form of a crescent, it is necessary to apply lint for new skin to fill the raw areas.

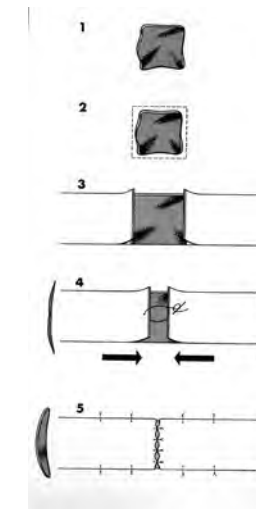


Fig. 2: Schematic representation of a skin autoplasty according to Celsus

In the field of eyelid surgery, our current method of blepharoplasty is already outlined by Celsus.

Here is the method to be used: The eye, being closed, one takes and elevates with the fingers in the middle the teguments of the upper and lower eyelids, to estimate the amount of skin one should remove to bring the things to a natural state. There are two inconveniences to fear: if one cut too much amount, the eyelid will not be able to cover the eye and on the other side, if the flap removed is not sufficient, it is like if nothing has been done and the patient underwent a useless operation. One first traces with ink two lines which delimitate the portion of skin to remove and one takes care to leave a portion of skin above the lashes to be able to place the skin sutures. This, taken into account, one makes the incision above the lashes for the prolapses of the upper eyelid and below when it is in the lower lid. One must start the incision on the temporal side for the left eye and on the nasal side for the right, and remove all the

teguments comprised between the two lines. The two borders of the wound are then united by a single suture and the eye closed. At the end of the operation, a cold compress is applied. The sutures are removed after four days.

Greek papyri

Several thousand papyri written in Greek and dating from the 2nd century AD have been discovered in recent years 400 km south of Alexandria. Among them, at least 250 are devoted to medical recipes related sometimes to surgical treatments (Fig. 3).

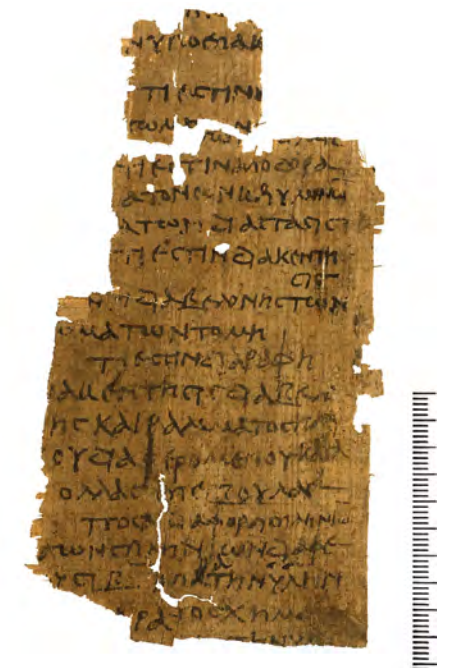


Fig. 3: Surgical questionnaire in a Greek papyrus, 2nd century AC. (pgen111-vi)

A few of these papyri describe operations to be performed on the face of the patient. According to the *humoral theory*, when the phlegm, which originates from the head, is excessive, it can affect the eyes and produce severe diseases, starting by what has been called the *fluxion of the eyes*. To stop this malefic flux, interventional methods are proposed and

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developed in detail. Although not performed for aesthetic purpose, the incisions and plans of dissection are very similar with our present operations for facial rejuvenation. Careful shaving and drawing of the incisions precede every procedure.

According to Egyptologist, Marie-Hélène Marganne, there are three main operations to address various stages of the disease: For the periskythismos by carnal growth (περισκυθισμός κατά συσσάρκωσιν)¹ for example, the surgeon makes a coronal incision from one temple to the other, down to the frontal bone, avoiding the coronal suture and the temporal muscles. After having cut the blood vessels, the frontal bone is partially denuded. The incision is kept open and covered with shreds soaked with wine and oil to obtain a thick scar, which will durably counteract the fluxion. (Fig.4) For less severe cases, one can use the per-



Fig. 4: Schematic representation of the periskythismos

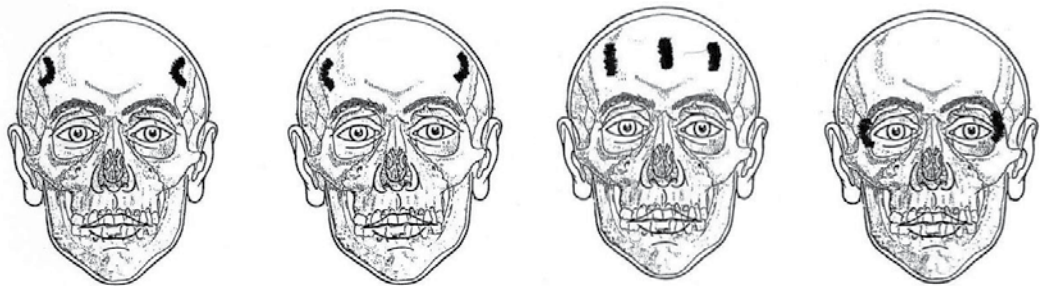


Fig. 5: Schematic representation of the hypospathismos

Although these operations are not justified according to today's concept of the pathology, they obey several criteria that prefigure modern surgical practice:

- 1) Plan an operation that will interfere with the propagation of the disease (stop the malefic humoral flow).
- 2) Advocate various approaches according to the severity of the disease, keeping the most mutilating for the most severe cases.

¹ The word *periskythismos* (περισκυθισμός) takes its origin from the Scytes who used to scalp their enemies after killing.

² From the word υποθασιστήρ (the rasp)

- 3) Make a clear cut and find the good plan of dissection to avoid any harm to important structures (vessels, nerves, muscles).
- 4) Care for the cosmetic result by making blind dissections through small incisions.

Conclusions

The few examples of facial operations described in this article are scattered over a period of more than two thousand years. They have been handed down to our knowledge through scribes who were probably not surgeons, but who carefully followed the various steps of surgical procedures, allowing the reader to put into practice the described operations. It is almost impossible to know whether these texts reflect methods that were innovative and original for their time, or if it refers to practices, which until then, had been transmitted orally.

One thing is certain. With their millenary tradition of embalming and mummifying corpses, the inhabitants of the Nile Valley had acquired rudiments of anatomical knowledge and the ability to penetrate and to suture human bodies, which is at the basis of surgery. The majority of these types of documents have been lost or destroyed, particularly after the disappearance of the Great Library of Alexandria. Thanks to archaeologists and linguistic experts, it is thus a great satisfaction to be able to rediscover nowadays a few procedures that have been used by our predecessors.

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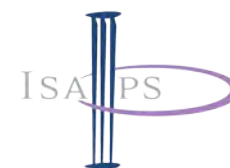
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