

History of Surgery

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Surgery



- Surgery is the branch of medicine that deals with the physical manipulation of a bodily structure to diagnose, prevent, or cure an ailment.
- Ambroise Paré, a 16th-century French surgeon, stated that to perform surgery is, "To eliminate that which is superfluous, restore that which has been dislocated, separate that which has been united, join that which has been divided and repair the defects of nature."



Surgery (Contd..)



- Since humans first learned how to make and handle tools, they have employed their talents to develop surgical techniques, each time more sophisticated than the last; however, until the industrial revolution, surgeons were incapable of overcoming the three principal obstacles which had plagued the medical profession from its infancy — bleeding, pain and infection.
- Advances in these fields have transformed surgery from a risky "art" into a scientific discipline capable of treating many diseases and conditions.

Origin

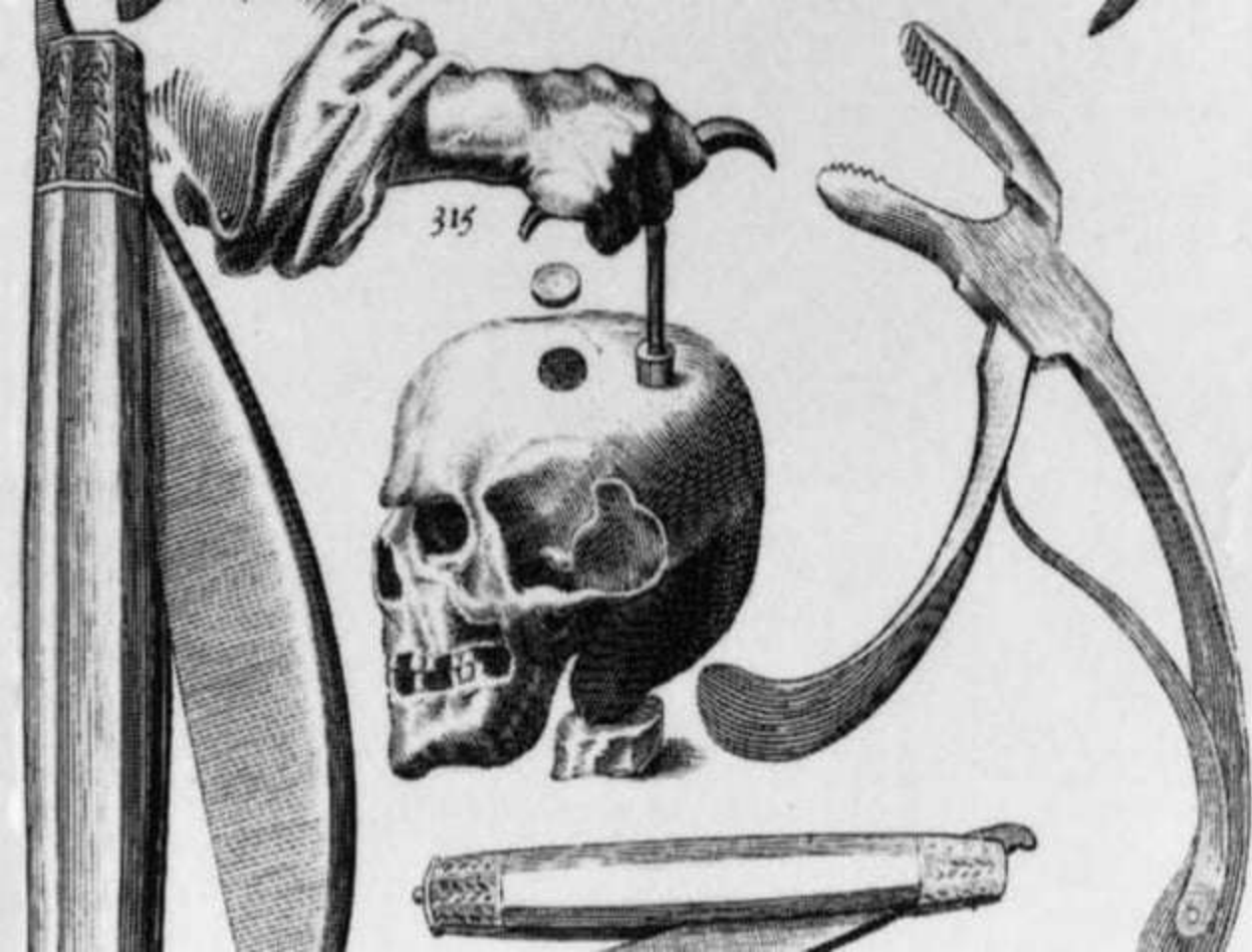


- The first surgical techniques were developed to treat injuries and traumas.
- A combination of archaeological and anthropological studies offer insight into much earlier techniques for suturing lacerations, amputating unsalvageable limbs, and draining and cauterizing open wounds.
- Many examples exist:
 - Some Asian tribes used a mix of saltpeter and sulfur that was placed onto wounds and lit on fire to cauterize wounds
 - The Dakota people used the quill of a feather attached to an animal bladder to suck out purulent material
 - The discovery of needles from the Stone Age seems to suggest they were used in the suturing of cuts (the Maasai used needles of acacia for the same purpose)
 - Tribes in India and South America developed an ingenious method of sealing minor injuries by applying termites or scarabs who bit the edges of the wound and then twisted the insects' neck, leaving their heads rigidly attached like staples.

Trepanation



- The oldest operation for which evidence exists is trepanation[2] (also known as trepanning, trephination, trephining or burr hole from Greek τρύπανον and τρυπανισμός), in which a hole is drilled or scraped into the skull for exposing the dura mater to treat health problems related to intracranial pressure and other diseases.
- In the case of head wounds, surgical intervention was implemented for investigating and diagnosing the nature of the wound and the extent of the impact while bone splinters were removed preferably by scraping followed by post operation procedures and treatments for avoiding infection and aiding in the healing process.
- Evidence has been found in prehistoric human remains from Proto-Neolithic and Neolithic times, in cave paintings, and the procedure continued in use well into recorded history (being described by ancient Greek writers such as Hippocrates).



Trepanation (Contd..)



- Out of 120 prehistoric skulls found at one burial site in France dated to 6500 BCE, 40 had trepanation holes.
- Folke Henschen, a Swedish doctor and historian, asserts that Soviet excavations of the banks of the Dnieper River in the 1970s show the existence of trepanation in Mesolithic times dated to approximately 12000 BCE.
- The remains suggest a belief that trepanning could cure epileptic seizures, migraines, and certain mental disorders.
- There is significant evidence of healing of the bones of the skull in prehistoric skeletons, suggesting that many of those that proceeded with the surgery survived their operation.
- In some studies, the rate of survival surpassed 50%.

Setting Bones



- Examples of healed fractures in prehistoric human bones, suggesting setting and splinting have been found in the archeological record.
- Among some treatments used by the Aztecs, according to Spanish texts during the conquest of Mexico, was the reduction of fractured bones:
 - "...the broken bone had to be splinted, extended and adjusted, and if this was not sufficient an incision was made at the end of the bone, and a branch of fir was inserted into the cavity of the medulla..."
- Modern medicine developed a technique similar to this in the 20th century known as medullary fixation.



General Anesthesia



- General anesthesia or general anesthesia is a medically induced coma with loss of protective reflexes, resulting from the administration of either intravenous or inhalational general anesthetic medications, often in combination with an analgesic and neuromuscular blocking agent.
- It is generally performed in an operating theater to allow surgical procedures that would otherwise be intolerably painful for a patient, or in an intensive care unit or emergency department to facilitate end tracheal intubation and mechanical ventilation in critically ill patients.

Attempts at producing a state of general anesthesia can be traced throughout recorded history in the writings of the ancient Sumerians, Babylonians, Assyrians, Egyptians, Indians, and Chinese.



Bloodletting



- Bloodletting is one of the oldest medical practices, having been practiced among diverse ancient peoples, including the Mesopotamians, the Egyptians, the Greeks, the Mayans, and the Aztecs.
- In Greece, bloodletting was in use around the time of Hippocrates, who mentions bloodletting but in general relied on dietary techniques.
- Erasistratus, however, theorized that many diseases were caused by plethoras, or overabundances, in the blood, and advised that these plethoras be treated, initially, by exercise, sweating, reduced food intake, and vomiting.



Bloodletting (Contd..)



- Herophilus advocated bloodletting.
- Archagathus, one of the first Greek physicians to practice in Rome, practiced bloodletting extensively.
- The art of bloodletting became very popular in the West, and during the Renaissance one could find bloodletting calendars that recommended appropriate times to bloodlet during the year and books that claimed bloodletting would cure inflammation, infections, strokes, manic psychosis and more.

Antiquity



- Mesopotamia
- Egypt
- Edwin Smith Papyrus
- India
- Mehrgarh
- Ayurveda
- Greece & Hellenized World
- Hippocrates
- Celcus & Alexandria
- Galen
- China
- Hua Tuo

Mesopotamia



- The Sumerians saw sickness as a divine punishment imposed by different demons when an individual broke a rule.
- For this reason, to be a physician, one had to learn to identify approximately 6,000 possible demons that might cause health problems.
- To do this, the Sumerians employed divining techniques based on the flight of birds, position of the stars and the livers of certain animals.
- In this way, medicine was intimately linked to priests, relegating surgery to a second-class medical specialty.

Egypt



Pictures of surgery tools at Kom Ombo, Egypt

- Around 3100 BCE Egyptian civilization began to flourish when Narmér, the first Pharaoh of Egypt, established the capital of Memphis.
- Just as cuneiform tablets preserved the knowledge of the ancient Sumerians, hieroglyphics preserved the Egyptians'.
- In the first monarchic age (2700 BCE) the first treatise on surgery was written by Imhotep, the vizier of Pharaoh Djoser, priest, astronomer, physician and first notable architect.
- So much was he famed for his medical skill that he became the Egyptian god of medicine.
- Other famous physicians from the Ancient Empire (from 2500 to 2100 BCE) were Sachmet, the physician of Pharaoh Sahure and Nesmenau, whose office resembled that of a medical director.



Adwin Smith Papyrus

The Edwin Smith Papyrus is a lesser known papyrus dating from the 1600 BCE and only 5 meters in length. It is a manual for performing traumatic surgery and gives 48 case histories.

The Smith Papyrus describes a treatment for repairing a broken nose, and the use of sutures to close wounds.

Infections were treated with honey.

For example, it gives instructions for dealing with a dislocated vertebra:

Thou shouldst bind it with fresh meat the first day. Thou shouldst loose his bandages and apply grease to his head as far as his neck, (and) thou shouldst bind it with ymrw. Thou shouldst treat it afterwards with honey every day, (and) his relief is sitting until he recovers.



India & Mehrgarh



India

- This list of Asiatic Indian inventions and discoveries details the inventions, scientific discoveries and contributions of India, including the ancient, classical and post-classical nations in the subcontinent historically referred to as India and the modern Indian state.

Mehrgarh

- Teeth discovered from a Neolithic graveyard in Mehrgarh had shown signs of drilling.
- Analysis of the teeth shows prehistoric people might have attempted curing toothache with drills made from flintheads.

Ayurveda



- Sushruta (c. 600 BCE) is considered as the "founding father of surgery".
- His period is usually placed between the period of 1200 BC - 600 BC.
- One of the earliest known mention of the name is from the Bower Manuscript where Sushruta is listed as one of the ten sages residing in the Himalayas.
- Texts also suggest that he learned surgery at Kasi from Lord Dhanvantari, the god of medicine in Hindu mythology.
- He was an early innovator of plastic surgery who taught and practiced surgery on the banks of the Ganges in the area that corresponds to the present day city of Varanasi in Northern India.

A statue of Sushruta (800 BCE), author of Sushruta Samhita and the founding father of surgery, at Royal Australasian College of Surgeons in Melbourne, Australia.



Greece & Hellenized World



- Surgeons are now considered to be specialized physicians, whereas in the early ancient Greek world a trained general physician had to use his hands (χείρ in Greek) to carry out all medical and medicinal processes including for example the treating of wounds sustained on the battlefield, or the treatment of broken bones (a process called in Greek: χειρουργείν).
- In The Iliad Homer names two doctors, "the two sons of Asklepios, the admirable physicians Podaleirius and Machaon and one acting doctor, Patroclus.
- Because Machaon is wounded and Podaleirius is in combat Eurypylus asks Patroclus "to cut out this arrow from my thigh, wash off the blood with warm water and spread soothing ointment on the wound."

Hippocrates

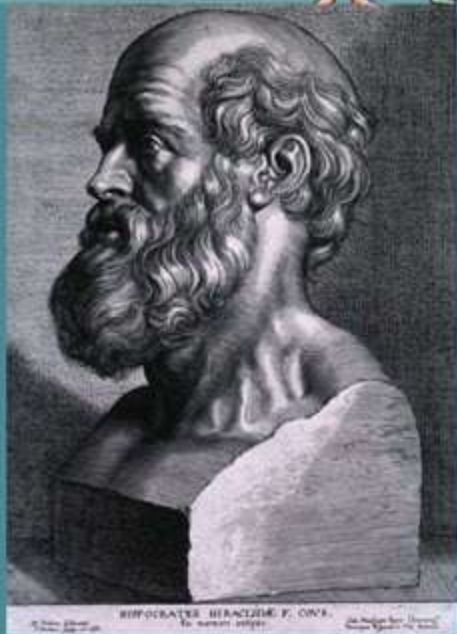


- The Hippocratic Oath, written in the 5th century BC provides the earliest protocol for professional conduct and ethical behavior a young physician needed to abide by in life and in treating and managing the health and privacy of his patients.
- The multiple volumes of the Hippocratic corpus and the Hippocratic Oath elevated and separated the standards of proper Hippocratic medical conduct and its fundamental medical and surgical principles from other practitioners of folk medicine often laden with superstitious constructs, and/or of specialists of sorts some of whom would endeavor to carry out invasive body procedures with dubious consequences, such as lithotomy.

Hippocrates (Contd..)



- Works from the Hippocratic corpus include;
 - On the Articulations or On Joints, On Fractures
 - On the Instruments of Reduction
 - The Physician's Establishment or Surgery
 - On Injuries of the Head, On Ulcers
 - On Fistulae
 - On Hemorrhoids



Celsus & Alexandria



- Herophilus of Chalcedon and Erasistratus of Ceos were two great Alexandrians who laid the foundations for the scientific study of anatomy and physiology.
- Alexandrian surgeons were responsible for developments in ligature (hemostasis), lithotomy, hernia operations, ophthalmic surgery, plastic surgery, methods of reduction of dislocations and fractures, tracheotomy, and mandrake as anesthesia.
- Most of what we know of them comes from Celsus and Galen of Pergamum

Galen



- Galen's On the Natural Faculties, Books I, II, and III, is an excellent paradigm of a very accomplished Greek surgeon and physician of the 2nd century Roman era, who carried out very complex surgical operations and added significantly to the corpus of animal and human physiology and the art of surgery.
- He was one of the first to use ligatures in his experiments on animals.
- Galen is also known as "The king of the catgut suture"

References



- [History of surgery – Wikipedia](#)
- [surgery | Definition, History, Type, & Techniques | Britannica](#)

😊 Thank You 😊

