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Research Article

### THE HISTORY OF ANAESTHESIA

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**Abstract:**

*Of all milestones and achievements in medicine, conquering pain must be one of the very few that has potentially affected every human being in the world. It was in 1846 that one of mankind's greatest fears, the pain of surgery, was eliminated. Anesthesia is one of the most important discoveries in the history of medicine and has completely revolutionized the quality of healthcare that patients can receive. In fact, it's almost impossible to imagine healthcare without the application of anesthesia. Today every single person benefits from painless surgeries and medical procedures, thanks to the remarkable discoveries in the field of anesthesia dating all the way back to 4000 BCE. Although the chemicals used as an anesthetic have significantly changed, many of the modern applications such as nitrous oxide and intravenous anesthetic are a result of discoveries in the 1600s and 1700s.<sup>[1]</sup> Now patients have several anesthetic options, from gas to IV, accommodating any kind of procedure they require. Anesthetic application is one of the most valuable components of modern healthcare and continues to be one of the leading interests in the medical field. Despite their necessity in modern medicine, scientists aren't sure exactly how anesthetics work. The best theory suggests that they dissolve some of the fat present in brain cells, changing the cells' activity. But, the precise mechanisms remain unknown. For now, next time you find yourself under the knife, just be happy they do.<sup>[2]</sup>*

*Keywords: Anaesthesia, history of medicine, anaesthetic, healthcare, surgery*

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## 1. INTRODUCTION:

Imagine being star of the show and audience cued to see you; tonight you having an arm amputating fully conscious; before anesthetics an evening at an operative theater was a place that audience would go to see the bloods, smell the wounds and hear the screams, they could also marvel to extraordinary speed of surgery;

In early 19th century, surgeons had to operate unbelievably fast before the patient was killed by shocked from the pain; [3]

Before the days of anesthetics, a patient was like a criminal awaiting execution; and helplessly gives themselves up to surgeon's cruel knife

No wonder the world was so desperate for anesthetics and the brave pioneers of pain control poisoned themselves and their servants in search of the perfect knockout from pain; [4]

There were pain relief agents around at the time like willow bark mandrake and laudanum or if you were lucky you might get roaring drunk before the operation, but usually surgeon didn't let you he'd like you to be conscious so you could tell if you still alive;[5]

## 2.HISTORY:

- It may come as a surprise, but the first attempts at using an anaesthetic go all the way back to 4000 BCE when historians believe Sumerians used opium poppy as a form of anaesthesia. However, it wasn't until the mid-1800s that anaesthesia as we know it today saw its first use. [6]

- The substance pioneered by the teenage chemist called Humphrey Davy; Davy heated ammonium nitrate and tested the effect on himself, in 1799 he had created nitrous oxide which became astonished that it made him laugh, so he christened laughing gas and no one realize that when it was discovered; he discovers substance which was a way to producing painless surgery and instead they had great parties with it as a recreational drug and medical professionals ignores nitrous oxide for the next 30 years; [7]

- Having a tooth removed was a common and painful operation at the time, American Horace wells, a dentist in Hartford, Connecticut, first used nitrous oxide in dentistry in December 1844. he believed so patiently in this new substance that he had one of his

healthy teeth taking out under nitrous oxide to show it didn't hurt; [8]

Laughing gas change dentistry forever and was particularly appreciated in the days before fluoride toothpaste and six-monthly check-ups; But nitrous oxide still wasn't perfect anaesthetic

- In 1846 in Boston Massachusetts the dentist William Morton gave ether as an anaesthetic for the first time; William Morton's place in its history is clear; he was the first to show how ether could be used to allay the pain of operations. This was at a public demonstration to the surgeons of the Massachusetts General Hospital, Boston, on 16 October 1846, for John Collins Warren to excise a tumour from a patient's neck. [9]

- On Saturday, December 19, 1846, a London dentist, James Robinson, demonstrated the administration of the anaesthetic gas ether for the first time in England. A couple of months earlier, William T. G. Morton had demonstrated ether anaesthesia on the other side of the Atlantic Ocean in Boston. [10]

- Robert Liston was noted for his skill in an era prior to anaesthetics, when speed made a difference in terms of pain and survival. on 21st of December 1846 Robert Liston determined to be a first surgeon in London to use this new substance, ether as an anaesthetic agent; an eyewitness said when the ether was put under patient's nose; he gurgled and went limp; Liston went to work with his trademark speed; the only noise from his patient was deep breathing, at end Liston noted his assistant to remove the ether from patient nose; the patients next word change the course of medical history: "when you plan to begin" [11] [12]

- Another doctor John Snow began to turn pain control into a science; Snow produce tables showing the correct amount of ether to be given he also invent new more convenient inhaler for patients; In 1847, he published *On the Inhalation of Ether*, a practical guide for administration of the drug. [13]

Liston's charisma and Snow's advances turn the discovery of anaesthetics into a public sensation; new type of surgery become possible before anaesthetic were available it was almost impossible to operate on the stomach and internal organ;

- In 1847 Maklakov N.V. Russian scientist proved the possibility of anaesthesia at the level of peripheral nervous system. he developed anaesthesia of the nerve trunk with ether. In addition, it showed the

dependence of the speed of onset of anaesthesia on the presence or absence of a myelin sheath in the nerve. he published the first Russian monograph on narcosis "Usage of ether sulphuric stream in operative medicine". [14]

- Chloroform was introduced in 4th of November 1847 by an Edinburgh obstetrician, James Young Simpson. Simpson eventually found the solvent called chloroform; he convinced that this was the staff to give to pregnant women for pain relief during giving birth; in 1853 the most famous celebrity mother imaginable, queen Victoria opted for a chloroform birth; [15]

- Vasily Konstantinovich Anrep, Russian scientist, professor of medicine and pharmacology. he graduated from the St. Petersburg Medical and Surgical Academy, then studied the physiology and pharmacology in Leipzig. [16]

In 1880 V.K. Anrep applied cocaine for anaesthesia, leading directly to the nerve. in 1884, he described the anaesthetic effect of cocaine and recommended it for use in medical practice. [17]

- In 1884 Karl Koller The founder of local anaesthesia an Austrian ophthalmologist and colleague of Sigmund Freud applied, inaugurated the modern era of local anaesthesia. he applied cocaine as a surface anaesthetic in eye surgery. after his presentation at the Heidelberg Congress, local cocaine anaesthesia attracted the attention of doctors all over the world. [18]

The following year, James Leonard Corning, American neurologist, injected cocaine between the spinous processes of the lower lumbar vertebrae, first in a dog and then in a healthy man. his experiments are the first published descriptions of the principle of neuraxial blockade. [19]

- In 1885 Lukashevich A.I developed a technique of conduction anaesthesia for operations on the fingers. Published the results of 36 operations performed under cocaine conduction anaesthesia. [20]

- William Stewart Halsted, together with his aide Dr.Hall, as the discoverers of the technique for blocking the inferior alveolar nerve and the antero-superior dental nerve using cocaine as an anaesthetic. The anaesthetic technique, described perfectly by both surgeons in 1885, has been revolutionary in the practice of odontology since its introduction, offering

dentists the possibility of performing invasive interventions to the maxillary without pain. [21]

- August Karl Gustav Bier was the first who published work on spinal anaesthesia and intravenous anaesthesia under a tourniquet. On 16 August 1898, Bier performed the first operation under spinal anaesthesia at the Royal Surgical Hospital of the University of Kiel. in 1905 Bier added adrenaline to Novocain to enhance the effects. [22] [23]

- In 1905 Procaine was first made in 1905 by Alfred Einhorn- German chemist, it was Einhorn who named the substance "Novocain." Until that time the primary anaesthetic in use was cocaine; [24] [25]

The main works are devoted to the study of the relationship between the structure and the physiological action of organic substances that cause anaesthesia, as well as the chemistry of alkaloids (cocaine, ecgonine, tropidine, etc.) [26]

- In 1915 VF Vojno-Yasenetsky Published a unique monograph "Regional Anaesthesia" where he summarized many years of experience of its application. [27]

- Alexander Vishnevsky, first director of the institute of surgery, Academy of Medical Sciences of the USSR. The founder of local anaesthesia according to the method of tight creeping infiltration [28]

In 1925 Vishnevskiy developed a new technique of local anaesthesia which he named a "method of crawling infiltrate". Vishnevsky created his own method of local anaesthesia, based on the original principle of promoting anaesthetic solution injected under pressure through anatomical cases and fascial slits of the human body, discovered by N.I. Pirogov. [29]

This method was named by A.V. Vishnevsky at the suggestion of his son A.A. Vishnevsky method of creeping infiltrate. To overcome the danger of intoxication with the introduction of large doses of anaesthetic solution, he proposed the introduction of a weak 0.25% solution of Novocain, which does not cause toxic effects.

In 1929 Vishnevskiy's method of local anaesthesia by 0.25% Novocain (trade mark for preparations of procaine) became a basic method of local anaesthesia in the USSR. [30]

In 1932 Vishnevskiy published his fundamental work "Local Anaesthesia by Method of crawling Infiltrate". It was a fundamental achievement of its time and is still regarded as a classic literature on local anaesthesia. [31]

According to Vishnevskiy's data (1970) near 80% of all surgical operations in wounded soldiers at the period of the Great Patriotic war from 1941 till 1945 were performed under local anaesthesia by the method of "crawling infiltrate". [32]

- In 1943 Nils Löfgren was a Swedish chemist who developed the anaesthetic Lidocaine (under the name Xylocaine). [33]

In 1948, Löfgren completed his doctorate, and the title of his dissertation was Studies on local anaesthetics: Xylocaine: a new synthetic drug, which has become, for many years, the drug of choice among all local anaesthetics. [34] [35]

In 1953, Löfgren and Claes Tegner, first received the topical anaesthetic drug, prilocaine (xylonest, citanest), an amide derivative of toluidine with a rapid onset of effect and an average duration of action. [36]

- In 1956 in the U.S. AF. Eckenshtam, Egner and Petterson synthesized mepivacaine local anaesthetic that derivate of the amide. [37]

- In 1956, at the Institute of Pharmacology and Chemotherapy of the Academy of Medical Sciences of the USSR, it was synthesized and studied in the laboratory of Professor G.P. Ponomareva, the first domestic amide anaesthetic mezocaine (trimekain) a derivative of xylydine. [38]

- In 1957, AF. Eckenshtam the American scientist was synthesized bupivacaine (Marcaine), developed on the basis of mepivacaine. It is the longest-acting local anaesthetic today. [39]

- In 1st March of 1962 Russian scientists; V.M. Vinogradov, P.K. Diachenko and V.V. Timofiev developed methods of "ganglion blockade in the absence of hypotension". The authors combined ganglioplegic drugs like hexamethonium or pentamethonium with vasopressors such as mezaton. [40]

- In 21st January of 1966 Society of Anaesthesiologists-Reanimatologists was formed in the USSR. [41] [42]

- In the 1990s, scientists of the "AstraZeneca" company developed a new long-acting anaesthetic naropin (ropivacaine). By chemical structure, it is similar to bupivacaine (butyl group attached to the amide is replaced by propyl). [43]

Ropivacaine was developed after bupivacaine was noted to be associated with cardiac arrest and arrhythmias particularly in pregnant women and also it has a cardio toxic effect Ropivacaine was found to have less cardiotoxicity than bupivacaine in animal models. it is used mainly for epidural anaesthesia, a block of peripheral nerves and postoperative pain relief. [44]

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