SHORT HISTORICAL REVIEW

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Remember: Ambroise Paré (1510–1590) – message for young surgeons

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Motto: "I dressed him. God healed him."

Ambroise Paré

Abstract

Ambroise Paré was a renowned French barber-surgeon, considered by many to be "the father of surgery". Originating from a family of barber-surgeons, he unraveled the secrets surgery at an early age, and he masters it by participating in the many military actions of the French Army of those times. As recognition of his merits, the kings of France proclaimed him their chief barber-surgeon and even president of the Royal College of French Surgeons. He was a doctor endowed with many qualities and contributed to the development of many medical specialties. Ambroise Paré has brought many contributions and innovations to the development of medicine. Worldwide, his name is closely related to the use of surgical hemostasis. As a true Professor, he offered his entire medical experience through the publication of 25 manuscripts that address various medical specialties. Perseverant and perfectionist by nature, Ambroise Paré represents a true role model for generations of surgeons to come.

Keywords: Ambroise Paré, history of medicine, surgery.

Introduction

Ambroise Paré (1510–1590), a French barber-surgeon, is one of the founders of modern surgery [1, 2]. The encyclopedic medical personality of the Renaissance made his mark in history due to the invention of vascular ligation, which completely changed the technique of mechanical hemostasis, thus opening a new era in the field of surgery [3, 4].

Ambroise Paré's activity is recognized in various medical specialties: obstetrics, neurosurgery, pediatric neurosurgery, dental surgery, pediatrics, orthopedics, ophthalmology, oncology, urology, etc. He described numerous new technical innovations, based on his comprehensive knowledge of surgery and his experience in military medicine. His entire legacy is archived in 25 books of anatomy and surgery, which contain a rich illustrating iconography as well.

Surgical career and education

Ambroise Paré, one of the most famous surgeons of the 16th century, considered by many authors to be "the father of modern surgery", was born in 1510, in Bourg-Hersent, near Laval, in Northwest France. Both his father and one of his bigger brothers were barber-surgeons, which encouraged young Ambroise to embrace early on, this profession (Figure 1) [4–6].

His surgical career began early, being the first aid to the private surgeon of Laval. At the age of 15, another he started a new apprenticeship at a surgeon-barber in Angers, and at the age of 19, he starts the courses of the famous Barber-Surgery School at Hôtel-Dieu Hospital in Paris (which at that time was associated with the Faculty of Medicine of the University of Paris) for a period of four years (1532–1536). In 1536, he received the title of master barber-surgeon and enrolled in the French Army to help the wounded soldiers [1–4, 7, 8].

Figure 1 – ***Portrait of Ambroise Paré (1510–1590) by William Holl (public domain).***

In the following decade, he worked for the French Army, where he gained significant experience in traumatology. He was appointed Chief Surgeon for the first time by General René de Montejan in the Italian campaign.

Because he was poor and his payment from the army was not enough he could not complete his full studies is noticed by his superiors and is assigned in the service of King Francis I (1494–1547), between 1536–1538 and 1542–1544. After he cured many senior officials, his reputation grew and soon became the best French surgeon, "the father of surgery, the surgeon of the court for the four kings of France," in the sixteenth century. Thus, in 1552, Paré was named the first royal surgeon, serving King Henry II (1519–1559), and later served all three royal sons: Francis II (1544–1560), Charles IX (1550–1574) and Henry III (1551–1589) [1–4, 6–10].

Unlike physicians and who were educated in the medical field at a medical school, and whose job was to diagnose patients and recommend certain treatments, the surgeons of that time duty was the practical side of medicine. In order to earn their living, surgeons had to do various activities, including haircuts or teeth extractions. Surgeons went through long practical apprenticeships that usually took place in public hospitals. Unlike in present-day hospitals, back then public hospitals took care of needy patients, who most frequently needed palliative care [1, 6, 11]. Certain authors make a distinction between surgeons, classifying them as barber-surgeons and self-standing surgeons. Therefore, "doctors of the short robe" were sometimes called the barber-surgeons and on the other hand, "doctors of the long robe" were called doctors and surgeons, although the university status was hardly grants to the surgeons [8].

Although he had not studied classical treatises written in Latin or Greek, he perfected his medical skills thanks to his vast experience, largely acquired in the battlefield. In 1554, the King intervened personally and offered him the opportunity to graduate from a medical school. Thanks to the King, he obtained the title of master at St. Cosma College of Pairs, after passing the exam in Latin [2, 6, 9, 10]. He was accepted in the Royal College of Surgeons in 1554, and as a recognition of his merits he is elected President of the College in 1567 [3].

As a sign of appreciation for his work, King Henry III named him First Surgeon and member of the Royal Council (1574), position he kept until 1587 [3, 6].

Contributions, innovations and his legacy to medicine

Ambroise Paré laid the foundation for the modern combination of scientific medicine and invasive procedures that define surgical interventions at the beginning of the 21st century [1].

Although he did not have university studies and was not versed in Latin or Greek, he based his work more on personal experience rather than on classical literature. Considered a "self-made man", he learned surgery on the battlefields [2, 12]. He was a physician endowed with many qualities, including intelligence, independence, originality, fine observer, even of the smallest details and, last but not least an admirable writer (Figure 2) [3].


LES
OEVVRES
d'Ambroiſe Paré,
CONSEILLER, ET
PREMIER CHIRVR-
GIEN DV ROY.
Diuiſees en vingt huict Liures,
Auec les figures & portraicts, tant de
l'Anatomie, que des inſtruments
de Chirurgie, & de plu-
ſieurs Monſtres.
Reueuës & augmentées par
l'Autheur.
Quatrieſme Edition.
A PARIS,
Chez Gabriel Buon.
1585.
Auec Priuilege du Roy.

Figure 2 – ***The tile page of Ambroise Paré Oeuvres, First Edition published in 1585 (public domain).***

He described a summum of rules for future surgeons: "to eliminate what is superfluous, to restore what was dislodged, to remove what has grown, to bring together everything that has been divided, and to remedy the defects of nature" [1, 6].

His work as a pioneer of surgery was mainly based in the field of military surgery, and was compared to his contemporary, Andreas Vesalius (1514–1564), which was a pioneer in anatomy [6, 7].

Ambroise Paré was also renowned as a surgeon who, unlike his colleagues, treated patients painlessly and maneuvered the tissues gently [1, 8].

Reformer of surgery, Ambroise Paré contributed to this branch of medicine. In the field of mechanical hemostasis, Paré reinvented vascular ligation, which he promoted and published in his treatises, at a time when most surgeons supported the benefits of wound blood loss for trauma patients [4, 6, 9, 10, 13–15]. He used the technique of grasping a bleeding vessel with a "bec de corbin" (crow's beak), while it was being ligated until the vessel was to be ligated [14]. The literature shows that Ambroise Paré promoted vascular ligation two centuries before John Hunter (1728–1793), who is credited for this invention [2].

His main field of activity was military medicine. Due to the experience and practical skills gained in the multiple battlefields, plus a developed clinical sense, careful observation, independent activity, logical reasoning and inventiveness, he published more works about the wounds produced by firearms. In these treatises, he describes pedagogically different methods that revolutionized the surgical technique [1, 6, 8, 14, 16].

At that time, the wounds produced by firearms and powder (classified as: concussive, burned and poisoned) were treated with boiled oil or with a hot iron, which sanitized the wound on one hand, but cauterized,

respectively expanded the wound in all three dimensions on the other. The procedure also induced fever, pain and marginal edema of the wounds. Paré replaces this treatment with a balm-based bandage made of egg yolk, rose oil and turpentine, which had a calming and healing effect, thus humanizing war surgery [1, 4, 6–10, 13, 14, 16].

Ambroise Paré had many contributions to the development of another branch of medicine, which will later be call dental medicine: he used dental extraction methods for teeth that could not be treat otherwise; used gum incisions to facilitate teeth eruption; initiated caries treatment (with a method of acid cauterization but did not refer to the filling of the remaining cavities). Another aspect is the involvement in dental transplantation, with its limits, becoming common in Europe between XVI and XVIII centuries. Even considered by some authors as the initiator of the dental implant, he has practiced the filling of the edentation with bone and ivory implants [7].

Considered as founder of obstetrics (until his contributions the field was recognized as a field of midwives and was surrounded by ignorance and superstition), he promoted the use of Caesarean (C)-sections. He noticed that in case of distocic presentation, it recommended to do a C-section instead going for a natural birth. He also supported the founding of schools for midwives [2, 4, 8].

In the field of, what will be called over 300 years later, pediatrics, Ambroise Paré concerned himself in his medical practice with childhood sufferings. His main concern was kid diets and nursing, with emphasis on childhood eating disabilities, pediatric trauma and disabilities [5].

He also had many contributions in orthopedics. He invented orthopedic devices, metal bracelets, even artificial limbs. He was particularly concerned with the treatment of vertebral deformities and especially scoliosis, for which he imagined new innovative therapeutic procedures. He also contributed to improve the technique of surgical amputations and to development of limb prostheses [4, 6, 7, 13, 15, 17].

Paré was also attracted to the field of neurosurgery, respectively pediatric neurosurgery, in which he had contributions related to cephalic hematoma, pre-natal hydrocephalus, which was clearly differenced from macrocephaly, conjugated twins, the cause of dystocia. He published all this experience and work in a treatise ("Generation de l'Homme"). Noteworthy was his attempt at healing the penetrating transorbital cerebral wound suffered by King Henry II during a joust of 1559 [2, 4, 16, 18]. During the autopsy, Paré observed that: "the veins bridging from the brain to the dura were the source of the subdural hemorrhage" [18]. He recognized what we call stroke today, also cured spinal dislocations by traction and advocated use of trephination in certain situations [16, 19].

In other medical fields, Paré was considered to be ahead of his time. With regard to infectious diseases, he noticed that flies are the vectors of some diseases. In the field of what later will become ophthalmology, he experimented with the use of artificial eyes [7]. He also approached ocular anatomy, visual theory and presented his experience in ophthalmic surgery [20]. He was concerned about the study of ocular prostheses, making artificial eyes from porcelain, glass, enameled gold and silver [6].

In his works, Paré described the treatment of urinary tract's lithiasis. In this way, he made his contribution to the foundation of urology [21].

To note that Paré introduced his own concepts to another discipline, which later will be call oncology [22].

It is noteworthy that Ambroise Paré used various innovative surgical instruments in his treatments [4, 6, 14, 18]. In the treatment of wounds, he used to use the red astringent wine as an antiseptic [7, 16]. Last, but not least, being an excellent practitioner and fine observer of the wounds, he invented remedies for chronic skin ulcers [1].

Because he treated important dignitaries and kings and had indubitably vast medical experience, Ambroise Paré published numerous and valuable manuscripts for future surgeons to come. By abandoning the academic tradition of writing in Latin, the scholarly language used in Europe at that time, and publishing directly in French, accompanied by a clear formulation and ease of accessibility, French surgeons appreciated him in a special way. His books were richly illustrated by presenting the various tools used – a novelty for these types of books [1, 9, 10, 13, 23].

He wrote his first book in French in 1545 and revolutionized the treatment of wounds produced by firearms, a work later translated into several languages. Other books followed, also in French, about obstetrics and the plague [3, 7, 9, 10]. It is worth noting that Paré's reputation has expanded with his book "Anatomie universelle du corps humain" [4, 6, 12]. In 1575, his entire work was published in French in the form of 25 books dealing with various subjects, such as anatomy, physiology, medicine, surgery, pathology, pharmacy, natural history, obstetrics and demonology. The treatise was translated to English by a London doctor, Thomas Johnson (1600–1644), and published in 1634 [3, 6, 12, 18].

Ambroise Paré is also remarkable through his simplicity and even humbleness in recognizing his limits and looking for another opinion in situations where he finds it is in the patient's best interest – which is an example to follow for all clinicians today [5, 12].

Personal life

Ambroise Paré was married twice: first time (1541) with Jehanne Mazelin, with whom he had three children and after becoming a widow, he married (1573) with Jacqueline Rousselot, with whom she had six children. Of all the children, none survived childhood [3, 6].

Considered by friends as a gentle, peaceful and honest man, uninterested in the intrigue of his times, Ambroise Paré loved the countryside, animals, but also good wines. As a doctor and a compassionate man, he cared for the poor people and was conciliatory with everyone. Ambroise Paré loved medicine and his country, France [3, 6].

Ambroise Paré was a humanist who slipped through endless wars in various battlefields, but also among the religious intolerance of the time [2]. He was involved in the religious dispute between Catholics and Protestants. As a Huguenot, he was able to survive St. Bartholomew's Day massacre (1572), being saved by King Charles IX himself, in whose service he was at that time [3, 4, 6, 7].

Ambroise Paré had many disciples, colleagues and friends, all barber-surgeons, including: Jacques Guillemeau

(1550–1613), Martin Boursier (1560–1632), Melchior Sebiz (1539–1625), Thierry de Héry (1505–1560) and so on [24].

In 1590, at the age of 80, Ambroise Paré died peacefully at his Paris residence, famous, loved and respected by surgeons, physicians and patients, the best-known surgeon of those times [1, 3, 6]. A monument was built to him at Laval [6].

Conclusions

Ambroise Paré succeeded in promoting and labeling surgery as an individually dedicated medical specialty, as until that time the doctors only worked with diagnosis and recommendation of drugs or conservative treatment. Recognized as one of the most important innovators during Renaissance, Ambroise Paré made important contributions in the medical sphere, such as military surgery, wound dressing, mechanical hemostasis, obstetrics, pediatrics, orthopedics and many others. He led his entire life based on the motto "*Omnia vincit labor improbus*", which is a distinctive mentality to perseverant and perfectionist personalities.

Conflict of interests

The authors declare that they have no conflict of interests.

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