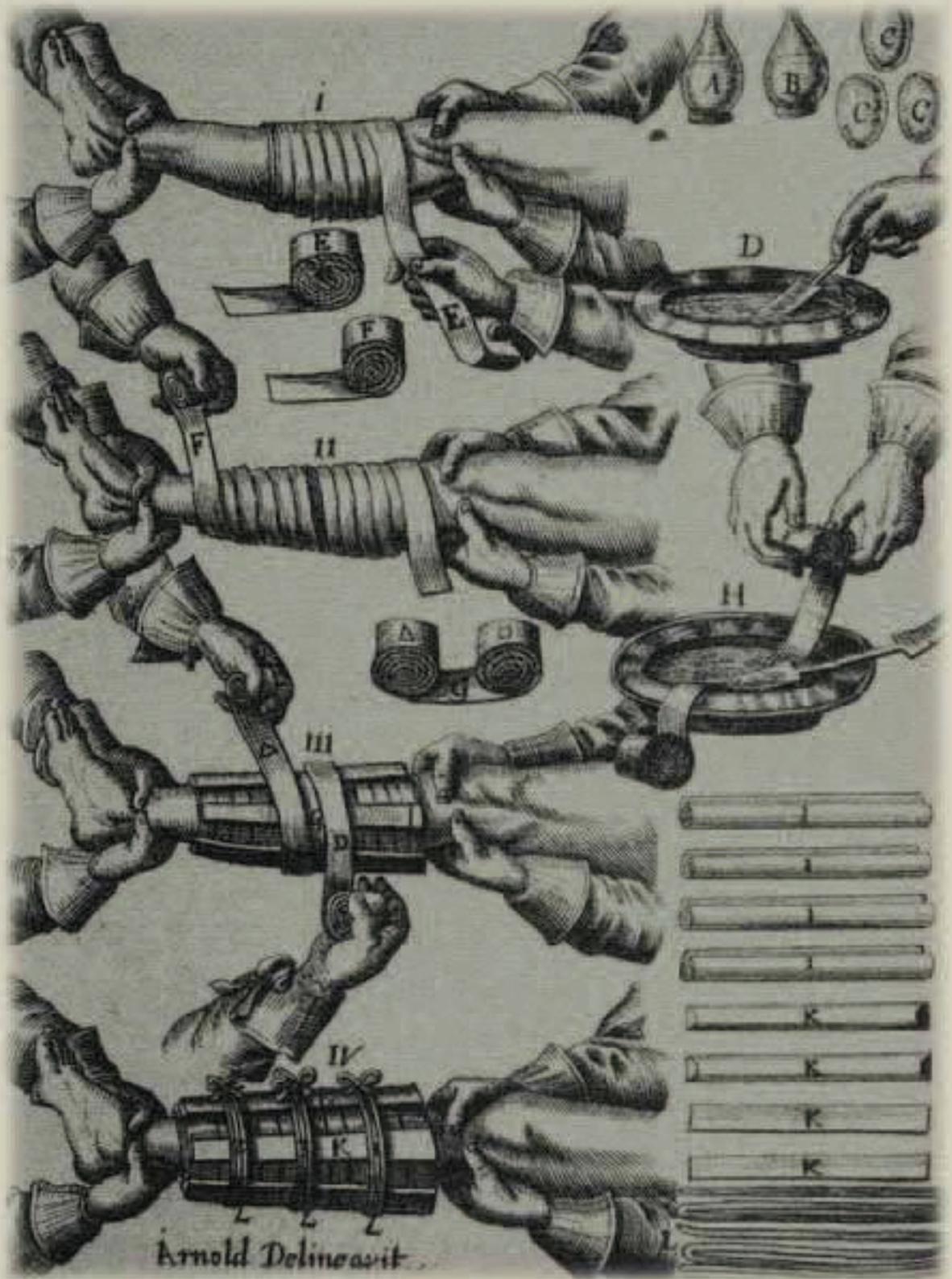


Procedures
for
bandaging
and
placing
wooden
splints

Simple Arm
Fracture,
by Arnold Delineavit
1666



From Bonesetters to Orthopaedic Surgeons: *A History of the Specialty of Orthopaedics*

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Even before caveman Grogg picked up a club and began to hunt, humans have suffered from fractures. As humankind became more aware of injuries and how to treat them, certain people accepted the responsibility of keeping and using that knowledge to heal. In tribal cultures, that person was, and often still is, a medicine man or bonesetter.¹ In technologically advanced cultures, the best-trained healer for fractures is the orthopaedic surgeon.

The orthopaedic specialty has come a long way since Grogg's day. The transition over time hardly makes sense. From a purely linguistic standpoint, the name, orthopaedic, indicates a specialty with children, not bones and fractures.^{2,3} The title of surgeon is equally odd. For hundreds of years, a surgeon was not an educated man, but a tradesman similar to a carpenter.^{4,5} Today's orthopaedic surgeons have spent years acquiring specialized knowledge and experience in the field. They treat all age groups and conditions that range from musculoskeletal diseases to compound fractures and joint replacements. How could such a transition take place?

EARLY EVIDENCE

Although there's no physical evidence remaining, skeletons from Grogg's day indicate that Neolithic people may have splinted fractures—probably with bark and sticks, secured with

bandages. Other primitive peoples also found creative ways to immobilize broken limbs. Tribes in South Australia made splints from clay, and the Shoshone Indians soaked strips of fresh rawhide in water and wrapped them around the limb. Rawhide and clay hardened as they dried, protecting the injured bone.⁴ As human civilization advanced, specific people were designated as healers and bonesetters. Often the techniques were passed down from generation to generation. They used their skills to treat the injured or sick, and, when appropriate, cast spells and used incantations to encourage healing. These men often paid a price if their treatment failed. As early as 1900 BCE in Babylon, King Hammurabi organized a code of laws that regulated medical practice and set penalties for failure. That code mentions specifically the “Gallabu,” bonesetters who handled minor surgery, dentistry and slave branding.⁴

The first known written instructions for surgery and bone-setting date to 1600 BCE. The Edwin Smith Papyrus, named for an American Egyptologist, described the appropriate treatment of fractures. The papyrus describes treatment for a broken upper arm:

“Thou shouldst place him prostrate on his back, with something folded between his two shoulders in order to stretch apart his upper arm until that break falls into place. Thou shouldst make for him two splints of linen, and shouldst apply for him one of them both on

the inside of his arm, and the other of them both on the underside of his arm. Thou shouldst bind it with ymrw [an unidentified mineral substance], and treat it afterward with honey every day until he recovers.”⁴

For a fracture of a skull, the surgeon would apply a potion made from an ostrich egg to dry the wound, and recite an incantation to call for the help of Isis, the Egyptian goddess of fertility. The papyrus also describes conditions that would not be treated. If the surgeon took the treatment of a patient beyond what was described, and the patient died, the surgeon could be impaled.⁴

that sickness was a penalty for sin and called for prayer and fasting. They were suspicious of medicine’s pagan origin and its connection with the teachings of non-Christian Arabs and Greeks. The church’s moral code was equal to law, and any breach could lead to excommunication.⁵ Instead of turning to healers and bonesetters, parishioners prayed to saints for healing.⁴ When all else failed, they turned to priests for help.⁵

For almost 1,000 years, there were no medical schools or other form of medical training in Western Europe.⁴ Priests studied Latin, making them the only ones able to read and use information from medical treatises. By 1100 ACE, the church



Woman
being bled
by a
Barber-
surgeon,
a woodcut

by Hieronymus
Brunschwig
1500

By the 5th century ACE, the writings of Sutra in India offered instructions for limb amputation and constructing iron prosthetics. Hippocrates also wrote a treatise on fractures and dislocations, known for its accuracy of anatomy and physiology, which addressed compound fractures, reduction, dressing, and immobilization. He described a wooden rack to treat a dislocated femur and techniques for extension and counter-extension.⁴

THE ROLE OF THE CHURCH

After the fall of the Roman Empire, advances in medicine slowed. The Roman Catholic Church became the governing body for social and religious activity.⁴ Church leaders believed

leaders became concerned about the clergy’s practice of healing. They worried that, if treatment went awry, the priests could have blood on their hands, and the church would have a scandal. The church enacted a series of laws that prevented priests and monks from attending public medical lectures and attempting surgery.⁵ A later act extended the same rules to physicians. The priests’ servants, the barbers, were the only ones permitted to perform surgical operations.^{4,5}

QUACKS AND TRADES

Because of their day-to-day interaction with people, barbers had the opportunity to perfect their techniques. Working with

the poor, they could observe and experiment without much fear of retribution. Fractures had to be set; aching teeth had to be pulled.⁶ Qualifications for work as a barber had more to do with strength, physique, stamina, speed and dexterity rather than education. These early surgeons were tradesmen and were educated by apprenticeships, not in schools. Physicians, on the other hand, had no practical experience. They were trained in philosophy, but not basic science. Often they treated only the royals, nobles and others wealthy enough to afford their services. When physicians prescribed bloodletting or surgery, they would supervise the work of a barber or surgeon.^{5,6}

money and bring hope to the sick.⁶ These professions included “quacks, empirics, mountebanks and itinerant operators for the stone, for hernia, and for cataract.” Although they had neither the experience of a barber-surgeon or the education of a physician, and their dealings were technically illegal, these opportunists were generally ignored as long as they were transient.⁴

THE ORIGIN OF ORTHOPAEDICS

The 17th century brought a better understanding of anatomy, the discovery of the circulation of blood, and a new technique for amputation using a flap.⁴ During that time, society’s view



At the Village Barber- surgeons

by David Ryckaert

By the 15th century, a barbers’ guild had formed in England to help recruit, train and regulate its members. Other professions had also sprung up. The surgeons and their guild competed with the barbers to treat the same ailments. Physicians were only allowed to treat internal conditions. The druggist mixed medications, but had to purchase chemicals from apothecaries. By 1540, Thomas Vicary helped put an end to the fighting and confusion by securing the king’s permission to unify the guilds of the barbers and surgeons. The same act also outlined the duties of the barber-surgeon, versus that of the physician or the apothecary.⁴

In addition to those who had the legal right to practice, other kinds of healers did what they could to make a little

of the crippled became more sympathetic, due mainly to the Poor Relief Act of 1601 which provided for their care. Treatments for conditions such as club foot started gaining more attention.⁷

This environment set the stage for Nicholas André, a professor of medicine at the University of Paris. André published the first textbook on preventing and correcting musculoskeletal deformities in children. The name of his treatise, *L’Orthopedie*, was created by joining two greek words—*orthos* (meaning free from deformity) and *paideia* (meaning child).^{2,7} The book, originally published in 1741, was translated into English, Belgian and German, spreading André’s techniques around the world.²

André used exercise, manipulation and splinting to treat deformities, and advised “remedies as are proper to relax tendons and muscles.” André compared his methods of treating limbs to those used to straighten young trees. That illustration became the icon for the specialty of orthopaedics.^{2,7}

This newborn emphasis on treating children and bone deformities was financially beneficial to barbers, surgeons and other bonesetters. Some used “straps of sticking plaster” to hold deformed feet into place. Others wrapped the feet in rags soaked a mixture of egg whites and flour, forming a paper-mache-like cast.⁷

The 18th century also saw the development of the first orthopaedic hospital. The hospital’s creator, Jean André Veneal, developed the club-foot shoe and methods to treat curvature of the spine.⁷

BRINGING FRACTURES INTO THE FOLD

Several factors from the 18th and 19th centuries influenced the transition from bonesetting to today’s orthopaedic surgeon. John Hunter’s research on tendon healing paved the way for tendon surgery.⁷ Wilhelm Konrad Roentgen discovered X-rays and their ability to image bones. Antiseptic and anesthetic techniques made surgical procedures safer and easier to perform.¹ However, the specialty of orthopaedics remained focused on the deformities of children until the 1890s.

Evan Thomas had been a well-known bonesetter in Liverpool. In spite of his thriving practice, and well-known clients, Thomas wasn’t allowed a hospital position because he wasn’t a physician. Thomas insisted that his son, Hugh Owen Thomas, attend medical school. His son became interested in orthopaedics and joined his father’s practice specializing in children’s deformities. When Evan’s health began to decline, Hugh learned bonesetting techniques to continue his father’s work.¹ Thomas went on to become famous in his own right, developing the Thomas splint, which is still used today. His free, Sunday-morning clinics for the poor were known worldwide.^{1,8}

Thomas convinced his nephew, Robert Jones, to attend medical school and join him in practice. After graduation, Jones became his apprentice and took over the practice when Thomas died of lung disease. Jones’ education, experience and location made him the perfect choice for the position of surgeon of the Manchester Ship Canal construction project.^{1,8} The canal connected the port of Liverpool to the manufacturing capital of Manchester. Jones set up surgical centers along

the canal to handle injuries of the 20,000 workers. This project quickly made him an expert in treating fractures. Soon, physicians from around the world who docked in Liverpool would stop at Jones’ clinic to learn his techniques.¹

When World War I began, Jones was the perfect candidate to organize the Army’s orthopaedic services. He was later knighted for those efforts. After the war, Jones helped establish a number of orthopaedic hospitals for children and founded the British Orthopaedic Association in 1918.^{1,8}

ORTHOPAEDICS TODAY

Andre gave the profession a name; Jones expanded the specialty to include fractures and the treatment of adults; and countless others developed surgical procedures to add to the breadth of the orthopaedic surgeon’s practice. Today’s surgeons treat the most complicated problems related to bones, cartilage, tendons, ligaments and nerves. They use surgical, medical, orthotic, prosthetic, and physical methods that have been perfected over hundreds, even thousands, of years.² Unlike the bonesetters or surgeons that spanned most of our civilization’s history, these specialists have the hands-on experience and years of education to give their patients high quality care.

What about the humble bonesetter? In many third-world countries where a majority do not have access to health insurance or government health care, treatment from a bonesetter is all they can afford. In South America and Africa, the shortage of qualified medical professionals is such a problem that the World Health Organization has funded better training for bonesetters and other medicine men.¹

The tradition lives on. 

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