

## **METHODS AND SIGNIFICANCE OF TEACHING THE STAGES OF DEVELOPMENT OF SPINAL SURGERY**

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### **ABSTRACT**

*Spinal injuries belong to the third category. Smith's papyrus lists six cases of ringing injuries, among which stretches, fractures, and protrusions were highlighted. The Egyptians knew that spinal trauma with spinal cord injury causes limb paralysis and impaired function of the pelvic organs. Such patients were treated with meat and honey applied to the neck area, and the patient had to be in a constant sitting position.*

**Key words:** result, "scoliosis", "kyphosis", "lordosis", Hippocrates, XIX - early XX centuries, patient.

### **INTRODUCTION**

The great Greek Hippocrates of Kos (460-390 BC) in his work

In his book "On the Nature of Bones" he described the anatomy of the vertebrae in detail and classified them into three groups corresponding to the modern division of the vertebrae into cervical, thoracic, and lumbar. Hippocrates even believed that supercomplete vertebrae could develop. He described the physiological curvature of the caller, used the term "ithiscolios" which means that the spinal column is straight in the frontal plane, but deformed in the sagittal plane. (The ancient Greek "scoliosis" has many meanings, among them - curved, curved). In another book, "On Joints", Hippocrates divided kyphosis into individual groups as a result of disease or injury, scoliosis, concussion of the spine (from the Greek seisis), dislocations of the vertebrae and fractures of the marginal branches, and described their clinical manifestations, and the concussion of the spine was understood to be damage complicated by spinal trauma with the development of paralysis. Hippocrates recommended treating scoliosis by dieting and stretching the esophagus.

### **LITERATURE REVIEW.**

He proposed two methods for correcting deformations. The first (Hippocrates' ladder) consisted in the fact that the sick man was tied with his face to a long ladder that was attached to the wall, and then pushed away so that the sick man, drawing a large arc in the air, fell on his back. It was assumed that the hump was being

straightened. The second device is a traction table on which the patient was stretched along the vertebral axis and compressed to the apex of the deformation with a board, one end of which was fixed to the wall, the ground, or the legs, hands, or even the weight of the doctor's entire body.

### **RESEARCH METHODOLOGY.**

Hippocrates' deep knowledge and experience allow him to be called the father of vertebratology. Hippocrates gave the first known description of lumbar pain. He discussed the nature of vertebral dislocations and their connection to limb paralysis, but it cannot be said that he fully appreciated the role of the spinal cord. In any case, Hippocrates did not believe in the possibility of effective correction of traumatic spinal deformities.

Celsius (30 BC) noted that damage to the cervical spine leads to rapid death; Aretaeus (150 BC) observed that in case of complicated disease in spinal trauma, the cause of paralysis is precisely at the level of injury (Cit.: Yashon, 1978).

Another great Greek, Galen (130-201 BC), experimentally proved that spinal cord injury causes paralysis and sensory disturbances more than distant trauma.

They suggested terms "scoliosis", "kyphosis", and "lordosis" [1]. He was able to compile a whole mass of modern medical knowledge and lay the foundations that European physicians used up to the late Middle Ages.

Traumatic paraplegia, with its symptoms described, is mentioned in the Talmud, the holy book of the Jews, and confirmed by research after death. The description relates to veterinary practice and concerns sacrificial animals.

Despite these and other observations, there were no reliable data on spinal function and treatment of spinal cord injuries during this period of history.

The early Middle Ages, in general, did not enrich the arsenal of knowledge about the spine. One of the outstanding figures of that time was Paul of Egina.

### **ANALYSIS AND RESULTS.**

Gradually, doctors became increasingly inclined to the opinion that active tactics are necessary for spinal column injuries. Ambroise Pare (1510-1590) believed that the dislocation of the spine should be eliminated by traction:

"You can make the incision in such a way as to release the fragments of the fractured vertebrae that compress the spinal cord and nerves" [2]. Diagnostic methods - palpation and the presence of crepitation. Pare is considered the foundation of corset therapy.

Petrus L'Argelata (1531) described the correction of the cervical spine fracture by pressure on the vertebral deformation apex. Fabricus Hildanus (1646) proposed to grasp the soft tissues of the neck with pins and then press them. If this was not

possible, the surgeon should have exposed the posterior parts of the spine and removed the bone fragments (Cited by Yashon, 1978).

In 1710, Nikolai Bidloe, a professor at the Moscow School of Medicine and Surgery, wrote in his "Instructions on Surgery"[3] that the body of the spine does not break because it is spongy. He recommended conservative treatment for fractures of the vertebral bodies, and surgical correction of the protruding vertebrae. These provisions probably reflected the views of European surgeons of that time.

In 1745, James proposed surgical treatment of spinal fractures. In 1768, Heister recommended immediate removal of fracture fragments. Geraud described an attempt to remove a musket shot from the vertebral body of a paraplegic wounded man. The attempt was successful from the fifth time, the wound was drained, and the patient's legs grew stronger. During the war of 1762, Louis removed a metal fragment from the lumbar spine with complete restoration of function. Similar interventions were carried out by Chopart, Desault (1796), McCline (1814), Tyrrell (1827), Smith (1828), Rogers (1835). Most surgeries were unsuccessful, but in some cases, a partial regression of neurological symptoms was achieved (Cit.: Yashon, 1978) [4].

In 1891 Hadra reported that he had tried to fix the protruding protrusions with conductive loops in Potts' disease (1891). Lange (1910) laid steel rods on both sides of the branches and fixed them with silk, and later - with wire. In the process of further development of vertebral surgery, the following main directions can be distinguished: treatment of injuries, degenerative lesions and deformities of various etiologies.

The treatment method for patients with spinal injuries has evolved through several stages, more or less clearly defined. Special literature contains only a small number of data relating to the period of the 19th century. The lack of any accurate diagnostic capabilities prevented the emergence of pathogenetically substantiated methods. In this regard, conservative treatment was reduced to a prolonged bed rest, sometimes with the use of a reclining gauze. The appearance of gypsum technology, in which the works of the great N.I. Pirogov played a significant role, allowed in the late XIX - early XX centuries to supplement the treatment of spinal injuries by immobilization with a corset. Rare surgical interventions consisted of open insertion of protruding vertebrae and attempts at decompression of the spinal cord in case of complicated vertebral fractures. How as noted above, the relationship between spinal column damage and the development of paralysis and paresis was recognized long ago. The first description of laminectomy in specialized literature dates back to 1814 (McCline). The operation ended in the patient's death. In Russia, the first such intervention was carried out in 1893 by I.F. Podberezkin (Citation by Ya.L. Sivyan,

1971) [5]. The first attempt at operative stabilization of the spine is attributed to Wilkins (1886), who tried to fix the vertebrae with a wire passed under the semi-arches of the vertebrae. The end of the 19th century and the beginning of the 20th century was a time of rapid development of all branches of medicine, including traumatology. Treatment methods for patients with spinal fractures, while remaining conservative in the vast majority of cases, have become much more pathogenetically justified since 1895 (the date of the discovery of X-rays). A sufficiently deep knowledge of the anatomy and physiology of the vertebral column has led to the understanding that damage to the vertebrae, accompanied by various disorders of bone structures and soft tissues, first and foremost, disrupts its stability, and the main efforts should be directed towards its restoration. From this, two main tasks arise: to restore the shape of the spine and to achieve stability. These tasks, naturally, remain relevant to this day. In conditions where anesthesia provision was in the early stages of its development, the methods of closed reposition of fragments of the damaged vertebrae and stabilization of the spine with natural muscle corset came to the forefront. With a certain degree of conditionality, several different approaches to solving this problem can be identified.

V.V. Gorinevskaya (1936) proposed and subsequently widely changed the method, which received the name of functional. The essence of the concept on which the method is based lies in the fact that a compression wedge-shaped fracture of the lumbar or thoracic vertebrae is an inflicted fracture, which contributes to the formation of a compression wedge-shaped fracture of the lumbar or thoracic vertebrae it allows for rapid consolidation and eliminates the possibility of secondary displacement, therefore, it is not advisable to correct its shape and is unlikely.

The patient lies on an inclined plane, on his back or on his stomach, with the armpit drawn. After a few days, the gymnastics classes begin according to the system developed by E.F. Dreving, first light, then more complex. The goal is to create a muscle corset and thus eliminate prolonged external immobilization, which has a number of extremely unwanted consequences. According to the author, the method "excellently combines two seemingly opposite principles: fixation of fragments, preventing their further displacement, and the possibility of movement, contributing to better blood supply to the damaged area and improving metabolism in the entire body" [6]. The main exercises are aimed at exercising muscle tensors and maintaining muscle tone in the extremities. By the end of the third month, the patient is allowed to stand up and to walk but not to sit.

The famous Austrian traumatologist Lorenz Böhler (1937) used his own method, based on gymnastic exercises that strengthen the muscles of the back, and in the

conditions of carefully modeled plain gypsum corset. The muscles of the neck are strengthened, in particular, by carrying weights on the head (up to 40 kg). According to the author, it strengthens muscles better than massage.

Before applying the corset, it is necessary to reposition fragments of the fractured vertebrae according to the author's method. After local anesthesia, the patient is laid on the table in such a way that it rests on the edge in front of them with the pelvic ring, the patient's legs are fixed to the table with a belt. The body is extended as much as possible, a wide supports are placed under the shoulders, while the patient's body hangs between the two supports, and the shape of the spine that has been damaged by the injury is restored. In this position, the gypsum corset is applied after the fact of reposition is confirmed by the X-ray image. In case of failure, repeated repositioning is performed by pulling the legs. The patient is laid on the stomach, the legs are drawn up with special cuffs over the lower thirds of the knees, so that the patient's pelvis rises above the table to the width of the hand. The achieved correction is fixed with a gypsum corset for 8-12 weeks.

“Watson-Jones (1930) used practically identical methods. The difference was only in the type of anesthesia and the technical means of repositioning. In our country, the first method of simultaneous repositioning was applied by B.A. Petrov (1933), its further development is associated with the names of I.E. Kazakevich and many others. The founder of SITO, N.N. Priorov, also paid attention to this problem” [7].

Another treatment option is slow repositioning of the fracture on a metal frame followed by the manufacture of a gypsum corset. Wallace was one of the first to apply this method. The author believed that if treatment on the chate is early, after 6 months, there will be a bone ligation in the area of the fracture. (Cited by: Ya.L. Sivyan, 1971). Among domestic authors, this method was most thoroughly developed by A.V. Kalyan (1979), [8] who used increasing density rollers for replacement, brought under the fracture zone. The method of gradual reposition is still used to this day, and various technical devices for reposition are proposed - from a screw dombra to pneumatic cushions.

Surgical treatment of spinal fractures in the first half of the 20th century was rare. This does not mean that surgical vertebrology did not develop, but rather, on the contrary. According to Menard (1895) is the first attempt to approach the vertebral bodies using dorsal access. Ventral transperitoneal access to the lumbar-crest spine was first performed by Muller (1906). Albee (1911) and Hibbs (1911) independently reported the experience of dorsal spondylodesis surgery as a method of stabilizing the spinal column. V.D. Chaklin is considered a pioneer of extra-abdominal access to the cervical-cranial region with full grounds, who operated on in Sverdlovsk in 1931,

Lovske was diagnosed with spondylolisthesis of the vertebra. Japanese (Ito et al., 1934) [9] reported ventral spondylosis techniques similar to those described by V.D. Chaklin (1939). The surgeons Hodgson and Stock (1956) were the first to describe the technique of ventral spondylodesis of the thoracic spine. Practically all of these interventions were proposed by the authors and were performed for tuberculous spondylitis, scoliosis, spondylolisthesis, but not for vertebral fractures. In most cases, spinal injuries were limited to dorsal spondylodesis or laminectomy - if necessary, spinal decompression. In the late 1950s, at the Novosibirsk Research Institute of Traumatology and Orthopedics, Professor Ya.L. Sivyan chose spinal surgery as the priority scientific direction of the institute. He created a school of domestic vertebrology, which firmly occupied a leading position in the country and has maintained it to this day. In 1966, the first manual on spinal diseases and injuries was published. It focused on treating spinal injuries. For Ya.L. Sivyan it was perfectly clear that the site of the surgeon's efforts to restore the normal shape and stability of the damaged spine should be the front column, which includes the vertebral bodies and intervertebral discs. A series of experimental and clinical studies conducted by the students of Ya.L. Sivyan allowed us to substantiate the options of ventral spondylodesis surgery, which are used strictly differentiatedly for various types of injuries: partial resection, complete replacement of the vertebral body, etc. I.L. Sivyan formulated and put into practice the concept of "a penetrating fracture of the vertebral body" [10] - damage characterized by a violation of the integrity of the closing plate of the vertebral body (often - cranial) with penetration of the tissue of the intervertebral disc into the thickness of the spongy bone. These injuries, like explosive fractures, require maximum full restoration of anatomical relationships in the damaged segment and reliable internal stabilization by a compact spongy autograft, i.e. ventral spondylodesis.

### **CONCLUSION.**

Vertebrology today is an independent field of medical knowledge, which, unfortunately, has not received all the grounds for this, and still has an official status. According to the definition given by Prof. N.G. Fomichev (1994), vertebrology is a science of etiology, pathogenesis, clinic, diagnosis, prevention, epidemiology and organization of medical care cystic assistance for pathological spinal column conditions, as well as functionally and anatomically related systems, organs, and tissues.

Our specialty is developing rapidly. According to Viscogliosi Bros. LLC, the number of vertebral interventions performed worldwide increased from 1.2 million in 1997 to 1.66 million in 2001 and is expected to reach 2.5 million by 2005. A number

of international scientific communities operate in Europe and abroad, whose goal is to investigate all aspects of spinal column pathology. The most famous are: International Society for the Study of the Lumbar Spine (ISSLS), Spine Society of Europe (SSE), Cervical Spine Research Society (CSRS), Sociedad Ibero-latinoamericana de Columna Vertebral (SILACO), Asia Pacific Orthopaedic Association - Spinal Section (APOA), Scoliosis Research Society (SRS), Groupe International Cotrel - Dubousset (GICD). In the mid-1970s, special vertebral journals appeared, both international (Spine, Spinal Disorders, European Spine Journal) and national (The Journal of Turkish Spinal Surgery). Various levels of scientific forums dedicated exclusively to general and specific vertebral issues are regularly held. On at the VII Congress of Orthopedic Traumatologists of Russia, held in Novosibirsk in September 2002 and dedicated to the issues of surgical vertebral, the issue of organizing the Russian Association of Vertebral Surgeons was raised for the first time. It seems that in the near future, one can expect a breakthrough in the field of vertebral, primarily in such areas as the creation of fundamentally new tools and new materials for implants.

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