CLINICAL ANATOMY OF THE NECK. ABOUT INTERVENTIONS IN THE NECK AREA

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The significance of damage to the carotid arteries for the blood supply to the brain has been tried to be elucidated for more than twenty centuries. Not only ideas about injuries, but also about some diseases associated with damage to the carotid arteries have been known since the times of Ancient Greece. Hippocrates at the end of the 4th century BC. argued that carotid artery injuries lead to contralateral hemiplegia. According to Rufus of Ephesus (c. 100 AD), the term "sleepy" means "stunned by a blow, stunned, or fallen into sleep." This is due to the fact that compression of the artery caused a loss of consciousness in a person - “sleep”. A similar description is found in the works of Ambroise Paré: “... the arteries, which are called carotid, or soporous, are the arteries of sleep.” The history of surgery for wounds of the blood vessels of the neck is shorter and goes back almost five centuries. According to the handwritten testimony of the French physician de Fourmestranxs, in 1552. Ambroise Pare was the first to successfully perform ligation of the common carotid artery and internal jugular vein, damaged by sword wounds. Moreover, in the postoperative period, the wounded man developed aphasia and contralateral hemiplegia. 20 years later, J. Abercrombie noted an analogy between the pathogenesis of cerebral ischemia and gangrene of the lower extremities. For the first time, a significant description of the cerebral vessels, including the vertebrobasilar system, was made by the Swiss physician Ehan Jakob Wepfer. In his treatise, published in 1658 in Schaffhausin, he wrote that it was the carotid arteries that provided blood supply to the brain. He was the first to note the connection between damage to cerebral vessels and symptoms of cerebral ischemia. Thomas Willis, guided by the works of Wepfer, Cassario and others, created his anatomy of the brain in 1664. Although he was not the first to describe the vascular circle of the base of the brain and which now bears his name, his treatise, illustrated by Christopher Wren, is recognized as a true masterpiece. In 1757, Else repeated the operation of A. Pare, but the patient died. The first case published in English literature dates back to 1811. Then John Abernethy performed ligation of the damaged common carotid and internal carotid arteries of a peasant who had been attacked by a bull. The wounded man survived the operation, but later died due to increasing symptoms of hemiplegia. Selective ligation of the common carotid artery, which had a positive result, was led by Hebenstreit, reporting this in 1793. In 1803. David Flemming on board the English ship H.M.S. Tonnant successfully performed ligation of the common carotid artery, damaged during a suicide attempt by a dagger in the neck, of one of the ship's crew members. In 1823, Mc Geil performed bilateral ligation of the common carotid artery with an interval of 1 month. In 1836, Astley Cooper studied the effect on the body of ligating the carotid and vertebral arteries separately. Later this operation was performed quite often. The first detailed statistics on the results of surgical interventions for injuries of the carotid arteries were

published by Norris in 1847; it included 149 cases of ligation of the carotid arteries with a 36% mortality rate and 21% residual effects. In 1868, Pilz published statistics based on 335 cases of ligation of the common carotid artery, brain disorders occurred in 32%, and mortality reached 54%. L. le Fort by 1871 collected 415 observations of ligation of the carotid arteries; Moreover, 100 patients had neurological disorders caused by cerebrovascular accidents. Siegrist statistics in 1900 already included 997 observations, with a mortality rate of 50%. De Fourmesteaux in 1907 analyzed the statistics of previous years and his observations and came to the conclusion that the mortality rate as a result of injury to the carotid arteries is about 54%. By the beginning of the 20th century, a clear distinction had been made between carotid artery ligation operations for fresh wounds and for aneurysms. Most authors noted a significant difference in the results of surgical treatment: mortality in operations for carotid aneurysms was about 13.5%, in operations for wounds – up to 50%. Another result of the development of carotid artery surgery was the conviction of most surgeons that ligation of the common and internal carotid arteries should not be sudden. When ligating the common carotid artery, Gotz observed the development of hemiplegia in 5 cases out of 6 ligations. At the same time, when ligating the carotid artery for tumors that have been compressing the vessel for a long time, the operation is tolerated quite well. Exceptional data were provided in 1882 by N.A. Velyaminov – mortality rate 6.8% for 32 ligations of the common carotid artery during operations for neck tumors. The supposed possibility of avoiding brain damage gave rise to the recommendation of applying incomplete ligatures. Matas in 1905, W. Dandy in 1907 and Halsted in 1911 suggested tight but not complete compression of the arteries with a metal clip, a catgut loop and a strip of fascia of the thigh before surgery in order to train the collaterals. Boerema used kelp for this purpose, which, absorbing liquid, expanded and gradually compressed the artery. But all these methods are unacceptable for stopping bleeding in wounds. Ceci suggested that the harmful effects of ligation of the common carotid artery are offset by simultaneous ligation of the internal jugular vein. In 1904, Boari successfully performed this operation for gunshot damage to the common carotid artery and cavernous sinus. In 1887, Frederic Treves wrote: “I think that ligation of the great arteries to stop bleeding from their distal parts is a rather rash, although widespread, recommendation; however, this technique is still widely used.” He described 4 cases of damage to the carotid arteries, in which he used temporary ligation of the damaged vessel to stop bleeding; 3 out of 4 victims survived. Temporary stoppage of bleeding was achieved by ligation of the carotid artery with a catgut loop, which was then released at various times after the operation. Despite this publication, temporary ligation of the great arteries was not subsequently used, and conventional ligature methods of stopping bleeding were used for more than 50 years, including during the First and Second World Wars. Moreover, during the First World War, American doctors in 25 cases of damage to the carotid arteries received a mortality rate of 44%. When English surgeons treated 128 of the same wounded, irreversible neurological disorders and death of the victims occurred in 29.6% of cases. As a result of summarizing the experience of the First World War, Makins proposed a conservative tactic for the treatment of penetrating neck wounds, while the indications for surgical intervention were, in his opinion, secondary bleeding, an increasing hematoma, compression of the esophagus or trachea. In Russia there is also N.I. Pirogov presented the first classification of gunshot wounds to the neck. Depending on the location of the wound and the direction of the wound channel, they identified 3 options for gunshot wounds of the neck. In addition, N.I. Pirogov was the first to

substantiate the urgent nature of surgical operations for injuries to large vessels of the neck. During the Crimean War, he performed 4 ligations of the carotid arteries, and in 2 cases the wounded survived without neurological disorders. With the development of the vascular suture technique, attempts were made to restore damaged neck vessels. In 1917, the French military surgeon Le Fevre successfully performed reconstructive surgery for damage to the common carotid artery. Depending on the location of the wound and the direction of the wound channel, they identified 3 options for gunshot wounds of the neck. In addition, N.I. Pirogov was the first to substantiate the urgent nature of surgical operations for injuries to large vessels of the neck. During the Crimean War, he performed 4 ligations of the carotid arteries, and in 2 cases the wounded survived without neurological disorders. With the development of the vascular suture technique, attempts were made to restore damaged neck vessels. In 1917, the French military surgeon Le Fevre successfully performed reconstructive surgery for damage to the common carotid artery. According to Russian surgeons, in the First World War, injuries to neck vessels accounted for 14-15% of combat vascular injuries. The results of treatment of injuries to the great vessels of the neck during the Second World War, according to foreign authors, were not much different from the experience of the First World War: at the same time, during the six-year period of combat operations, there is only one mention in the literature of a successful result of the use of reconstructive intervention. Fresh wounds of neck vessels were extremely rare. The majority of the wounded (up to 54.4%) died either from ongoing external bleeding and the development of acute irreversible blood loss on the battlefield, or as a result of the development of purulent-septic complications in the immediate period after injury. At the stage of qualified care during the Great Patriotic War, wounded with injuries to the blood vessels of the neck accounted for no more than 3.7% of all vascular injuries. This was mainly due to late evacuation, the lack of rational methods for stopping bleeding, and limited use of infusion and antibacterial therapy at the stages of medical evacuation. With injuries to large vessels of the neck, due to the anatomical features of their location, spontaneous cessation of bleeding, unlike vessels in other areas, is much less common and is possible only with a narrow, tortuous wound channel. Correction of hemodynamic disturbances that occur during acute blood loss and traumatic shock is a difficult task even in modern conditions. Mortality among victims of injuries accompanied by blood loss of more than 1500 ml is 64.4%. When blood loss exceeds 1500 ml and continues for several hours, as a rule, the wounded person dies. With a rapid loss of 3 liters of blood, i.e. 60-70% of the circulating blood volume, death occurs instantly from collapse and cardiac arrest.

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