# COLLATERAL CIRCULATION IN THE LIGAMENTS OF THE ACCESSORY VEINS OF THE SPINE.

**Suleimanov Remzi Ibraimovich, Assistant**

**of the Department of Human Anatomy**

**Samarkand State Medical University**

**Resume:** The article examines the collateral capabilities of the spinal vein system. The involvement of venous formations of the spine and, in particular, inside the vertebral venous plexuses as collateral blood flow pathways is generally recognized. The role of other venous formations such as the veins of different parts of the spine, the veins of individual vertebrae.

**Keywords:** spine, blood, cell, vertebral plexuses, thoracic region, veins, blood flow.

# КОЛЛАТЕРАЛЬНОЕ КРОВООБРАЩЕНИЕ В СВЯЗКАХ ДОБАВОЧНЫХ ВЕН ПОЗВОНОЧНИКА.

**Сулейманов Ремзи Ибраимович, Ассистент**

**кафедры Анатомия человека**

**Самаркандский государственный медицинский университет**

**Резюме:** В статье изучены коллатеральных возможностях системе вен позвоночника. Участие венозных образований позвоночника и, в частности, внутри позвоночных венозных сплетений, как путей коллатерального тока крови общепризнана. Роль других венозных образований таких, как вены разных отделов позвоночника, вены отдельных позвонков.

**Ключевые слова:** позвоночник, кровь, клетка, позвоночные сплетения, грудной отдел, вены, ток крови.

# УМУРТҚА ПОҒОНАСИНИНГ ҚЎШИМЧА ВЕНОЗ ЧИГАЛЛАРИНИНГ КОЛЛАТЕРАЛ АЙЛАНМА ЙЎЛЛАРИ.

**Сулейманов Ремзи Ибраимович, Ассистент**

**Одам анатомияси кафедраси**

**Самарқанд давлат тиббиёт университети**

**Аннотация.** Мақолада умуртқа поғонасининг вена тизимининг коллатерал имкониятлари ўрганилган. Умуртқа поғонасининг веноз шаклланишлари ва, хусусан, умуртқа ичидаги веноз чигаллари коллатерал қон оқими йўллари сифатидаги иштироки умумий тан олинган. Бошқа веноз шаклланишларнинг роли, масалан, умуртқа поғонасининг турли бўлимларининг веналари ўрганилган.

**Калит сўзлар:** умуртқа поғонаси, қон, ҳужайра, умуртқа чигаллари, кўкрак бўлими, веналар, қон оқими.

**Introduction.** Spondylogenic lesions of the nervous system are the most common chronic human diseases [1]. Neurological manifestations of lumbar osteochondrosis account for 60–70% of all peripheral nervous system disorders and are the cause of 70% of cases of temporary disability [2]. At the same time, a significant role in the pathogenesis of neurological manifestations of lumbar spine osteochondrosis is played by impaired venous circulation. Veins have thin walls and low blood pressure, so they are compressed much more easily during compressive processes than arteries, which have dense walls and high intra-arterial pressure [3]. In cases of intervertebral disc prolapse, compression of the anterior internal vertebral venous plexus and the intervertebral venous plexus occurs in 84% of cases according to venospondylography data [4,6]. Impaired venous outflow from the internal and external plexuses of the spinal canal is accompanied by reflex arterial constriction, thereby preventing a sharp increase in venous pressure in the spinal canal [5,8]. However, this reduces the amount of blood flowing not only to the spinal cord and roots but also to the vertebrae, creating

conditions for hypoxia. This leads to edema, impaired microcirculation in the bony structures of the spine, and accumulation of under-oxidized metabolic products [7]. As a result, the function of both the spinal cord and its roots, as well as the vertebral-motor segments, is affected.

**Study Objective**. The aim of this work was to study the collateral possibilities of the vertebral venous system.

**Materials and methods.**The study was conducted on 56 adult cadavers. The method used was interstitial injection of oil-based contrast mass prepared according to the Gerota technique.

**Results.**In the upper and lower thoracic regions, blood flow was evenly directed toward both the anterior and posterior surfaces; in the mid-thoracic region, it was predominantly toward the posterior surface. In the lumbar region, with the exception of the L-I vertebra, blood drainage was directed toward the intrapvertebral venous plexuses of the vertebral arches. From these, blood flow could proceed in ventral and dorsal directions — respectively, to the intrapvertebral and posterior external plexuses. Along the spine, drainage of blood to the outer surface of the vertebral arches was more pronounced at the cervical and upper thoracic levels than at other levels. Laterally, blood from the articular and transverse processes drained into the surrounding vertebral veins; the veins of these processes run along their upper and lower surfaces. Venous outflow from the spinous processes was directed toward the external surfaces. Veins of different anatomical parts anastomose with each other. This circumstance, under appropriate conditions, apparently can facilitate changes in the direction of blood flow within the venous network of a single vertebra. Veins of individual vertebrae are interconnected by vessels running both horizontally and vertically. In the cervical region, these include the plexuses of the vertebral, intervertebral, and deep cervical veins; in the thoracic region — segmental veins; in the lumbar region — lumbar and ascending lumbar veins; and in the sacral region — anterior sacral, median and lateral venous plexuses, and posterior external sacral veins. The intrapvertebral

plexuses also belong to this group. The listed veins connect the vertebral veins in the cervical region with the subclavian, internal jugular, and brachiocephalic veins; in the thoracic region — with the azygos and hemiazygos systems; in the lumbar region — with the inferior vena cava; and in the sacral region — with the internal iliac and common iliac veins. It should be noted that along the spine, the direction of blood flow at the levels of L-I, L-IV, and L-V changes predominantly in zonal directions. Thus, from the bodies of cervical vertebrae — toward the posterior surface; at other levels, in an equal number of observations, both anteriorly and posteriorly. Consequently, the veins of individual vertebrae, through mutual anastomosis, form the overall venous system of the spine. The connection of the latter with the main veins of the neck, superior and inferior venae cavae, pelvic veins, and veins of the soft tissues of the back provides opportunities to store and redistribute blood flow direction with minimal overload to the body. The obtained data show that the direction of blood flow from different anatomical parts of the vertebra is not uniform. Blood flow from the vertebral bodies can occur in two directions: anteriorly — to the anterior external vertebral plexuses, and posteriorly — to the intrapvertebral plexuses.

**Conclusion.** An important factor contributing to the increase in compensatory capabilities of the vertebral veins is their anastomoses with extravertebral vascular formations. These include:

a) anastomoses of the vertebral veins with intracranial venous structures (suboccipital, retromastoid, nuchal plexuses, veins of the posterior condylar emissary, plexus of the hypoglossal nerve canal, marginal, occipital, basilar, inferior petrosal, and cavernous sinuses);

**References.**

**1**. Akhmedova, S. M., Korzhavov, Sh. O., Mamataliyev, A. R., Mirazimova, I. B., & Ruzieva, N. D. (2020). Anthropometric indicators of physical development in children under 5 years of age in the Samarkand region. In SCIENTIFIC RESEARCH IN XXI CENTURY (pp. 250-258).

**2.** Blinova, S. A., Oripov, F. S., Dekhkanov, T. D. Morphofunctional features of neuroepithelial bodies in the respiratory region of the lungs // Bulletin of Science and Education. - 2020. - No. 10-3 (88). - P. 82-84.

**3.** Mamataliyev, A. R., HISTOTOPOGRAPHY OF THE PROSTATE GLAND IN THE RABBIT // Economy and Society. – 2025. – No. 2-1 (129). – pp. 319-321.

**4.** Yakubovich, S. I., Mamataliev, A. R., Omonov, A. T., & Abdumuminovna, S. Z. (2023). HYPERTROPHIC RHINITIS IN CHILDREN: ENDOSCOPIC TREATMENT. European International Journal of Multidisciplinary Research and Management Studies, 3(02), 22-27.

**5.** Mamataliyev A. R., Sh R. S., Zohidova S. H. EKSPERIMENTAL JIGAR SIRROZI SHAROITIDA PASTKI PORTO KAVAL VENOZ TIZIMI MORFOLOGIYASINING ORGANILGANLIK DARAJASI // Economy and Society. – 2024. – No. 4-1 (119). – pp. 1346-1350.

**6.** MAMATALIYEV A. R. AGE-RELATED MORPHOLOGICAL CHANGES IN THE NERVE STRUCTURES OF THE APPENDIX IN RABBITS // ECONOMY. – pp. 199-201.

**7.** Mamataliyev A. R. QUYONLARDA CHUVALCHANGSIMON OSIMTASI NERV TUZILMALARINING YOSHGA BOGLIQ MORFOLOGIK OZGARISHLARI //Economy and society. – 2025. – No. 3-1 (130). – pp. 199-201.

**8.** Davlatov S.S., Khidirov Z.E., Nasimov A.M. Differentiated approach to the treatment of patients with Mirizzi syndrome //Academy. – 2017. – No. 2 (17). – P. 95-98.

**9**. Mamataliev A. R. INNERVATION DISORDER AND MUTATIONAL PROCESS IN TISSUE // Economy and Society. – 2025. – No. 4-2 (131). – P. 876-880.