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Virchow's node: historical and didactic features of the description of the eponym

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The eponym is a part of the nomenclature of medicine. In 1848, R. Virchow described the enlarged left supraclavicular lymph node (Virchow's node), which he uncovered by physical examination. He believed that such lymphadenopathy occurs in cases of stomach cancer (less often – with lung cancer), when the metastatic process spreads up the thoracic duct to the left supraclavicular fossa. He described the pathogenesis of this trait and proved its malignant nature. Russian authors, apparently, borrowed this eponym from German textbooks on medicine. In 1886, Troisier added to Virchow's insights and presented a detailed substantiation for the increase in the size of the left supraclavicular lymph node. Troisier described its typical location above the middle third of the clavicle behind the clavicular portion of the sternocleidomastoid muscle. He considered this enlargement as a direct sign of the existence of a neoplasm in the abdominal cavity or in the pelvic cavity, breast cancer, tuberculosis, and syphilis. In his opinion, identifying a diseased lymph node by physical examination does not indicate the exact location of the primary focus of the tumor, but will direct the diagnostic search in the right direction. Palpable lymph nodes in the supraclavicular fossa (Troisier-Virchow), as a rule, indicate a malignant nature. If the lymph node enlargement is due to tumor emboli in cases of stomach cancer, it should be referred to as Virchow's metastasis. Troisier's symptom can be detected due to the metastasizing of cancer of other abdominal organs and the small pelvis, lung, breast, esophagus and tuberculosis lesions.

Keywords: *Virchow's node, Troisier's sign, the history of oncology, teaching in medical higher education institutions*

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An eponym can signify a disease (nosological form), a clinical symptom, an anatomical structure, a method of treatment or a medical (surgical) instrument named after the person who first discovered, described or created it. Doctors can lend their name to their discovery – or, more often, third parties link certain accomplishments with a particular person. This is an old tradition – to name a symptom, a syndrome or a disease after a person who contributed to describing it.

Eponyms were widely used in the 19th and 20th centuries in scientific works and textbooks, as well as in medical communications. These eponyms instill medical language with a special richness. In memory they evoke vivid imagery rather than complicated concepts. Critics of this practice argue that eponyms can lead to some difficulties when communicating professionally; they, as a rule, lack the specifics and accuracy of a definition, which gives rise to the necessity for discussions. Therefore, some of them have disappeared from usage. Opponents of these critics (they are becoming fewer) are confident: eponyms enrich both printed text and the doctor's spoken

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language. As a consequence, universal eponyms that are generally accepted in world literature still remain, preserving their name's accuracy.

Practically in all textbooks for medical school students in most countries, the so-called Virchow metastasis (or Virchow's node) can be found. One of the eponyms that physicians of the world should know, it appears in the "investigation of the lymphatic system" section. This is a lymph node that has been affected by metastasis of a malignant tumor and located in the medial section of the supraclavicular triangle in the region of the left venous angle at the confluence of the jugular and subclavian veins. The clinical significance of this symptom cannot be overestimated, since along with the symptoms of obstructive jaundice, cirrhotic ascites, metastasis to the umbilicus (Sister Mary Joseph's nodule), paraproctium (Schnitzler) and the ovary (Krukenberg's tumor), it unequivocally testifies to the fourth, final, stage of malignant a tumor of the abdomen.

Presumably, the initial discovery of the lymphatic system belongs to the ancient Greeks, Herophilus and Erasistratus (4th to 3rd century BC). "Vessels containing white blood" was how Hippocrates saw them. The Italian doctor Marcello Malpighi (1628-1689) described the lymph nodes as formations located along the vessels. The location of the nodes, their structure, and the features of the networks containing the "milky liquid" were studied [1].

The 19th century was distinguished by the formation of, and amazing progress in, the field of pathology. At that time, various diseases' connection to the lymphatic system was investigated. The first objective connection between the systemic spread of a malignant tumor and the characteristic enlargement of the left supraclavicular junction was established by the "father of modern pathology," the founder of social medicine Rudolf Ludwig Carl Virchow.

At first, Virchow wanted to study theology. However, due to his weak voice, he had to abandon his initial plans and turned to medicine. On October 21, 1843, he defended his dissertation on the manifestations of rheumatism on the cornea [2] and then went on to an internship in Charite (Berlin). In 1844, he became assistant to Robert Friedrich Froriep, a well-known pathologist, under whose guidance he studied microscopy. Subsequently, he spoke of the need to use microscopes in teaching students, encouraging his students to "think microscopically."

Virchow recognized social inequality as one of the causes of diseases. Outbreaks of illnesses cannot be eliminated using only medicines, correcting nutrition and improving clothing quality and housing conditions. The situation of the entire population, its social well-being, needed to be improved. In considering medicine a social science, he was a passionate fighter against poverty, advocating for reforms of the existing socio-economic and political system. Doctors, in his opinion, as advocates of the poor, should help solve their problems.

In 1848, Virchow described the enlarged left supraclavicular lymph node ("Virchow's node"), which he revealed by physical examination. He believed that such lymphadenopathy occurs in cases of stomach cancer (less often – with lung cancer), when the metastatic process spreads up the thoracic duct to the left supraclavicular fossa. He described the pathogenesis of this trait and proved its malignant nature [4].

Russia, apparently, borrowed this eponym from German medical textbooks, retaining their allegiance to the country where N.I. Pirogov and F.I. Inozemtsev interned and sourced the fundamental principles of the faculty and hospital stages of student training.

R. Bartholow wrote in 1880 that a palpable lymph node on the left collarbone would point to the malignant nature of the pancreatic lesion [5], but this comment was long ignored, going without evaluation or use in practice.

In France, the USA and some other countries, this symptom is often associated with Charles-Emile Troisier. He was born in France on April 16, 1844. In 1874, he defended his thesis ("Recherches sur les lymphangites Pulmonaires"), dedicated to the study of "pulmonary lymphangitis" (lung carcinomatosis, according to the modern nomenclature), for which he was awarded a silver medal of the Paris Medical School. In his research, he explained tumors' ability to spread along the lymphatic pathways of the lungs.

Troisier became a member of the National Medical Academy and Anatomical Society and vice-president of the Society of Biology of France. Physicians remember his name thanks to his explanation for the causes of left supraclavicular lymphadenopathy (Troisier sign), variants of the

clinical course of meningitis, pleurisy, hereditary syphilis and rickets, ileofemoral thrombosis (white phlegmia), and bronzial diabetes, hemochromatosis (Troisier-Hanot-Chauffard syndrome) [6].

In 1886, Troisier added to Virchow's insights and presented a detailed substantiation for the increase in size of the left supraclavicular lymph node. Troisier described the typical location of the node above the middle third of the clavicle behind the clavicular portion of the sternocleidomastoid muscle. He considered that both right and left supraclavicular lymph nodes may be involved in the pathological process. However, there is predominant localization on the left side, where lymphatic drainage into the venous network comes from the larger part of the body [7]. He considered this enlargement of the lymph node as a direct sign of the existence of a neoplasm in the abdominal cavity or in the pelvic cavity, breast cancer, tuberculosis and syphilis. Often an easily palpable and even visible lymph node can be stigmatic, the only symptom of an existing severe disease. In his opinion, identification of a diseased lymph node by physical examination does not indicate the exact location of the primary focus of the tumor, but will direct the diagnostic search in the right direction.

Metastases of tumors of the organs of the abdominal cavity (stomach, colon) and small pelvis (uterus, ovaries) are more often found on the left, which they reach through the thoracic lymph duct. Thus, the Troisier sign is an indicator of a widespread disseminated cancer of one of the organs of the abdomen, and not just the stomach (as described by Virchow). According to his observations, the nodes of the supraclavicular area may also increase in size with lymphoma, benign chronic inflammatory diseases, including tuberculosis, but supraclavicular lymphadenopathy has a malignant nature in more than 80 percent of cases. Troisier believed that supraclavicular lymphadenopathy was a symptom not only of stomach cancer, and demonstrated that "it occurs in other malignant diseases that affect the pancreas, liver, kidneys, ovaries and testes. It does not concern the localization of the lesion, but it indicates a malignant nature, the final stage of this disease, the generalization of the process and its inoperability." This symptom can be combined with an increase in size of other groups of lymph nodes in other parts of the body, but usually this is the only lesion predicting cancerous cachexia and death a few months after its onset [8, 9].

Troisier stressed that the lesion usually affects one or more nodes behind the middle third of the clavicle in the supraclavicular triangle, usually on the left. These increases in size are of an isolated nature, but sometimes a conglomerate of several nodes is formed. In the beginning, they can be detected only by precision palpation, but at an extended stage, these nodes roughly deform the supraclavicular fossa. Affected lymph nodes are movable, not attached to the skin and painless. They rarely cause compression of neighboring anatomical formations [8, 9].

For the purposes of differential diagnostics, Troisier suggested carefully analyzing the patient's history, conducting a detailed clinical examination, and removing the lymph node for microscopic examination [9].

It was established that a large number of lymph nodes are located from the periphery towards the thoracic duct and venous angle. The supraclavicular is closest to the mouth of the lymphatic duct. From the organs of the abdominal cavity, through numerous networks of lymphatic vessels, the lymph enters through celiac lymph nodes into the *cisterna chyli,* located anterior to the first lumbar vertebrae, and then into the thoracic duct. Passing through the thoracic duct, it enters the venous angle formed by the left internal jugular and subclavian veins.

At present, there are several hypotheses for the movement of tumor cells from the thoracic duct to the supraclavicular lymph node. According to the first, there is obstruction: the tumor cells obstruct the lymph flow, there is a reflux into the neighboring nodes. The second hypothesis is that during breathing, retrograde current of lymph occurs, there is reflux because of the negative pressure created in the chest during breathing. Another version suggests direct lymph flow: in some patients, the thoracic duct is divided into branches ending in the lymph nodes. The thoracic duct with its branches brings the lymph with tumor cells [10, 11].

Palpation of supraclavicular lymph nodes, in which the doctor stands behind the sitting patient, is methodically substantiated. It is possible to detect lymph nodes from the position of the patient lying on his or her back. The Valsalva maneuver helps bring the lymph nodes to the

surface of the body and increases the chance of finding and palpating them [12].

Prior to the discovery of tumor markers, the Troisier symptoms made a great contribution to determining the localization (albeit inaccurate) of the mass. However, even now peripheral lymphadenopathy, revealed by physical examination of the patient, constitutes a diagnostic task. A palpable left supraclavicular lymph node indicates possible malignant tumor of the pancreatoduodenal zone, hepatocellular carcinoma, colorectal cancer, bladder cancer, prostate cancer, lung cancer of the fourth stage, as well as tuberculosis, lymphoma, sarcoidosis and toxoplasmosis. Hodgkin's disease often affects the cervical and axillary lymph nodes. A puncture or excisional biopsy with histological examination can help in verifying the diagnosis. A careful physical examination of the patient can direct the diagnostic reasoning of the doctor, and provides for diagnosing the final stage of cancer without involving expensive equipment, reducing the economic costs [13].

The almost simultaneous discovery of the significance of supraclavicular lymphadenopathy in benign and neoplastic diseases became known as the Virchow node (metastasis) and the Troisier sign. Palpable lymph nodes in the supraclavicular fossa (Troisier-Virchow), as a rule, indicate a disease of malignant nature. If the lymph node's enlargement is due to tumor emboli in cases of stomach cancer, it should be referred to as Virchow's metastasis. Troisier's sign can be detected due to the metastasizing of cancer of other abdominal organs and the small pelvis, lung, breast, esophagus and tuberculosis lesions. The didactic significance of this sign is significant, and it requires mandatory study and use by students in the third to sixth years of clinical oncology research departments.

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