

TO THE QUESTION OF LIFETIME DIAGNOSIS STRANGULATION

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ANNOTATION

The aim of the research is to study contemporary domestic and foreign literature reflecting modern views on methods for expert evaluation of the viability of strangulation furrows, as well as to propose new methodological approaches to solving this problem. Information on the resolution of expert questions related to the study of the duration of the injury, using the example of mechanical asphyxia, is provided. It has been noted that immunohistochemical and morphometric methods can be a promising direction for investigating the lifespan of strangulation furrows in forensic medicine.

Key words: The mechanics of asphyxia, strangulation.

According to domestic and foreign authors, out of the entire spectrum of MA, strangulation asphyxia (SA) is the most commonly encountered in expert practice. It is common knowledge that the presence of a strangulation groove (SG) in a corpse does not always indicate death by hanging or strangulation. Hanging can be posthumous (often in the form of suicide). There are many cases of postmortem bronchial accidents, both true (when the neck of a corpse is compressed) and false (traces of collar pressure in the initial manifestations of pustular emphysema, excoriations on the neck in obese people, etc.). In order to establish the cause of death, in addition to autopsy, additional methods are widely employed in expert practice, both for detecting signs of compression and for determining whether compression occurs during life .

The purpose of the study – to study the modern domestic and foreign literature reflecting modern ideas about methods of expert assessment of the viability of strangulation furrows, as well as to propose new methodological approaches to the solution of this problem.

Forensic examination is of great importance in establishing the appearance of the M.A. and fixing the loop with one's own or another hand. Forensic examination involves removing fingerprints from the hand and the surface of the S.B. with the help of a sticky ribbon. In a number of cases, coloured prints are used to detect metallic microparticles.

The presence of deposits of biological origin: epidermal cells, dried blood and lymph stains, hair and others - on the supposed instrument of strangulation allows to determine their species, group and sex affiliation by means of serological and cytological methods. In this way, a specific object can be identified as a weapon of injury.

When examining the body, it is necessary to pay attention to the location of the body's stains and biological fluids, which contradict the position of the body; the absence of a stand without which it is impossible to secure the free end of the loop at this height; the discrepancy between its material and the nature of the wound; the opposite arrangement of fibers on the fixed end of the pedestal and the support; the presence of clean grooves in the supports and the supports of the victim; the presence of signs of struggle on the body and around it

In cases of putrefactive changes in the soft tissues of the neck, it is necessary to restore the original type of damage (slag, scarring, bleeding, wounds). To do this, the skin is treated according to the Ratnevsky method, washed with running water (with subsequent drying), treated with a 15% solution of hydrochloric acid, followed by the addition of 15% acetic acid.

There are methods of biochemical and histochemical investigation which are intended for use in cases where strangulation is not observed during life.

It has been proved that glycogenolysis, anaerobic glycolysis, and muscle tension during convulsions cause an increase in glucose and lactic acid in the blood of the vessels of the body, but as a result of the isolation of the cerebral parts of the vascular system, the amount of these substances in the blood remains low. Determining the difference in glucose content can be used as an additional criterion in the diagnosis of

CA.

Some authors maintain that mechanical hypoxia leads to rapid and sharp depletion of glycogen reserves in the myocardium, but not in the liver, while others note that hanging reduces the amount of glycogen in the liver by an average of 27%, while maintaining it in the skeletal muscle and heart.

Suggestions were made to investigate pericardial fluid and blood in order to identify additional signs of strangulation during life. Biochemical markers of hypoxia were found not only in the blood, but also in the vitreous body of the eyes. The content and ratio of some macro- and microelements in the SK skin was determined by emission spectral analysis, but in practice these methods are not widely used.

A general pattern can be observed: the more labour-consuming the method is and the greater the financial costs involved in its implementation, the less likely it is to be used, even if it is highly effective. It is possible to expect to be put into practice only with the development of inexpensive diagnostic methods that do not require significant additional time from experts. As a rule, this is an improved version of the old methods or a new diagnostic criterion, which is determined by the old methods. In this regard, histological studies are of particular interest.

Histological studies for the diagnosis of asthma were first used by I.I. Needing in 1868, but the largest works on this topic date back to the mid-20th century. The first forensic medical histology manuals provide a detailed description of the microscopic picture of the thyroid gland and internal organs, which has been incorporated into more modern textbooks. Diagnostic criteria for local compression of the skin were formulated: - absence of a horn layer of the epidermis in the area of the dermis, including with hemorrhages in the dermis and the surface of the epidermis; - thinning, flattening of all other layers of the epidermis, their dystrophy and necrosis (especially when using rigid loops); - densification and basophilia of the dermis in the area of the dermis; - presence of interstitial rollers with thickening,

These signs are of particular importance in the differential diagnosis of true and false blood pressure.

To prove that Sb is alive, the classic is pronounced hyperemia of the skin vessels of the marginal and intermediate rollers with perivascular hemorrhages, as well as hemorrhages in the dermis and fatty tissue, especially of a stratifying nature and spreading to a considerable distance from the vessels. Derma sometimes swells, collagen fibers swell and become congealed, epidermis and muscle fibers undergo dystrophic and necrotic changes (cytoplasm bazofilis, cell boundaries become blurred, caryolysis or caryopyknosis), leukocytes are peripherally elevated, there is scarcely a blood clot in the blood vessels, vesicles swollen with fluid, blood and fat are present in the interstitial valve, regional lymph nodes. However, none of the aforementioned signs of life expectancy are observed in 74% of cases.

In addition, blood flow and hemorrhages are sometimes detected in cases of postmortem BP, if there is a prolonged vertical position of the body in a tightly closed loop and a liquid state of blood in the corpse.

The proposed macro-and microscopic methods for detecting vascular skin lesions and other lesions during life, based on stereomicroscopic studies of macro-preparations, have not found their application in expert practice. Infra-red photography was also recommended before dissection, which allows for a clear identification of the condition of the subcutaneous blood vessels, the presence of hemorrhages, small sediments, straightened contracted rollers. These methods were intended to assist in a more complete and objective assessment of the vascular reaction, but they are hardly used in expert practice.

Thus, the problem of diagnosing CK during life remains incompletely resolved.

Forensic physicians remember the discussions that revolved around the gistochemical dyes proposed by some authors to determine the life span of the skin. It has been established that bazoophilic dermis staining and other changes in its tinctorial properties occur only to a lesser extent in postmortem skin lesions, therefore the signs of the gistochemical specificity of the skin were rejected. As a result, it was concluded that coloring with picrocarmine-indigocarmine gives only a slight difference in the shades of lifetime and post-mortem BP and consequently has auxiliary value. In cases

of weakly expressed cerebral palsy, no differences were found in the coloration associated with the presence of cerebral palsy during life or after death.

Иногда возникают эпизодические попытки использовать тинкториальные свойства тканей для установления прижизненности strangulации. В работах авторов приведены критерии прижизненности СБ, основанные на исследовании изменений в нервных аппаратах шеи, нижнем ганглии блуждающего нерва и спинномозговых ганглиях. Предложенные нейроморфологические методики технически сложны, требуют дорогостоящих реактивов и практически не используются.

Occasionally attempts are made to use the tinctory properties of tissues to establish that strangulation occurs during life. In the authors' works, the criteria for the survival of the cervical spine are given, based on the study of changes in the nervous apparatus of the neck, the lower ganglia of the vagus nerve, and the spinal ganglia. The neuromorphological methods proposed are technically complex, require expensive reagents, and are practically never used.

Abroad, in cases of strangulation MA, cervical lymph node, tongue, carotid body, lung, cortex of brain and skin from the area of SB are subjected to histological examination. Histological examination of the soft tissues of the throat helps to prove the lifespan of the injuries according to the identified hemorrhages [11,12]. In addition, it allows for the detection of a specific injury to the neck, which has not previously been described in the literature, namely a microscopic (0.25-0.7 mm) bone fragment with hemorrhage and fibrin deposition near the bifurcation of the common carotid artery. This fragment is found only when hanging completely with the side position of the loop. It is thought to be a fragment of the cross-section of the IV cervical vertebrae, which is separated when hanged with a push.

In the past, attempts were made to establish new histological criteria for the viability of strangulation, for example, by cytophotometric measurements of the content of DNA in dermal cells. These methods proved to be too expensive and labour-intensive to be put into practice.

The following suggestions were preferable. Yu.G. Zabusov and A.M. Shiryak [5] proposed a histological examination of the lymph nodes located above the strangulation (embracing, mandibular) and below them (armpit, chest or clavicle) and to compare their blood filling and susceptibility to hemorrhages. The authors consider strangulation to be accompanied by hemorrhages into the subcutaneous base above the lymph node capsule above the strangulation, and a sharp hyperemia of the venules around the capsules and in the capsule of these lymph nodes, if these signs are absent in the lymph nodes below the strangulation, to be signs of strangulation during life. The absence of a difference can serve as proof of a posthumous imitation of hanging.

A. Hayakawa et al. suggested taking into account thyroid-globulin levels in the blood to prove that CA is still alive.

The question of self-depression remains controversial. The authors observed such a case, but the elastic bandage was used as a loop.

Thus, the efforts of researchers in solving the problem of establishing the viability of SB are aimed at identifying specific signs both biophysically and morphologically. Currently, the immunohistochemical (IHC) methods popular in morphology are not being actively introduced, which have proved their importance in solving the once insoluble problems of forensic medicine. In particular, the exudation of plasma proteins (common fibronectin, fibrinogen, plasma proteins, etc.) into the damaged dermis is easily detected immediately after the damage by IGC, which convincingly indicates that strangulation is still alive. Unfortunately, there are very few forensic studies of this kind in the literature.

Another promising area of research may be a deeper analysis of organ hemodynamics in strangulation MA, which undoubtedly has specific features in various types of death. In particular, analysis of the blood filling of the lungs, brain and heart by means of morphometric methods of studying blood circulation may give considerable information about strangulation during life. It is very interesting from a scientific point of view to observe the state of the pulmonary tissue at different rates of death in the case of CA.

The advantages of a quantitative approach to studying the features of strangulation MA, namely, morphometric methods for studying its local and general features, are evident.

Thus, the problem of diagnosing strangulation mechanical asphyxia during life remains relevant in forensic medicine. This problem can be solved by applying new methodological approaches based on the introduction of immunohistochemical methods into forensic practice and a morphometric approach to organ hemodynamics.

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