

A.P. Stepanchuk, I.L. Fedorchenko, A.M. Pryshliak¹, A.V. Piluhin, K.V. Shepitko²
Poltava State Medical University, Poltava
¹ I. Horbachevsky Ternopil National Medical University, Ternopil
² Municipal non-profit enterprise "Kotelya Hospital of planned treatment", Kotelya

THE NORMAL ARCHITECTONICS OF THE GREATER OMENTUM VASCULATURE IN ELDERLY PEOPLE OF BOTH GENDER

e-mail: fedorchenkoigor@ukr.net

Variability of topography of arteries and veins of the greater omentum, taken from 20 cadavers of elderly people was investigated by the methods of anatomical preparation and morphometry. The right and left gastro-omental arteries form the superior arterial arch in 15 of 18 cases, and did not anastomose in 3 cases. The inferior arterial arch was present in 1 of 20 cases. The left gastro-omental artery was absent in 2 of 20 cases. The central artery has a greater length and outer diameter both in women and men. The veins, in comparison with the arteries, have a larger outer diameter and one vein accompanies the artery of the same name. The zone of the central, and in its absence – the right and left medial arteries of the greater omentum can be used for obtaining the graft for transplantation in the quadrangular and triangular shapes of the greater omentum of the elderly people.

Key words: human greater omentum vasculature, morphometry, topography of arteries, gastro-omental arteries, right gastro-omental arteries, left gastro-omental arteries

А.П. Степанчук, І.Л. Федорченко, А.М. Пришляк, А.В. Пілюгін, К.В. Шепітько АРХІТЕКТОНІКА СУДИН ВЕЛИКОГО ЧЕПЦЯ В ЖІНОК І ЧОЛОВІКІВ ПОХИЛОГО ВІКУ В НОРМІ

Методами анатомічного препарування та морфометрії досліджена варіабельність топографії артерій і вен великих чепців від 20 (по 10 чоловічої і жіночої статі) трупів людей похилого віку. Права і ліва шлунково-чепцеві артерії утворюють верхню артеріальну дугу в 15 із 18 випадків, а в 3 випадках артерії не з'єднувалися. Нижня артеріальна дуга була наявна в 1 із 20 випадків. Ліва шлунково-чепцева артерія в 2 із 20 випадків була відсутня. Центральна артерія має більшу довжину і зовнішній діаметр у жінок і чоловіків. Вени, в порівнянні з артеріями, мають більший зовнішній діаметр і в кількості однієї вени супроводжують однойменну артерію. Венозна кров від великого чепця відтікає в систему ворітної вени через верхню брижову і селезінкову вени. Зона центральної, а при її відсутності правої і лівої медіальних артерій великого чепця може використовуватися для трансплантата при чотирикутній і трикутній формах великого чепця в людей похилого віку.

Ключові слова: судини великого чепця людини, морфометрія, топографія артерій, шлунково-чепцеві артерії, права шлунково-чепцева артерія, ліва шлунково-чепцева артерія.

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Rare cases of primary torsion of the omentum and idiopathic segmental omental infarction are treated by surgical laparoscopic removal (omentectomy) within healthy tissues to avoid complications, gastric vein thrombosis and portal vein thrombosis of the liver [2, 3, 7, 8]. To optimize the surgical procedure of excision of the autograft from the large omentum, the surgeon must be guided by the variability of its vascular architecture and vascular bifurcation standards. Current domestic publications do not elucidate data on the topography, length and diameters of vessels of the human greater omentum. At the same time, since no analysis of data on their normal number and branches in the omentum has been found, our study was aimed at this issue. In the literature, there are differences and few data on the individual and age characteristics of the vessels of the human greater omentum [9, 10]. In case of unsuccessful conservative treatment of primary or secondary inflammation of the greater omentum, its resection is indicated. Being involved in the intercurrent process, the greater omentum can twist, and with a change in intra-abdominal pressure and hyperperistalsis of the small intestine, the right part of the greater omentum (with its multi-lobed form) can wrap, which contributes to disruption of its blood supply due to vascular compression [8]. All of the above often puts the surgeon in front of the need for surgery on a large omentum, which requires knowledge of variations in topography and the number of vessels in the omentum in humans.

The purpose of the study was to establish the topographic and morphometric variability of the arteries and veins of the greater omentum from elderly women and men.

Materials and methods. The arteries and veins of the greater omentum from 10 male cadavers and 10 female cadavers have been studied. The deceased were elderly people without intra-abdominal lesions. Vasculature of the greater omentum was examined during the autopsy in accordance with the Cooperation Agreement with the Pathology Department of the CE "O.F. Maltsev Poltava Regional Clinical Hospital PRC" and Poltava Regional Autopsy Bureau. The method of anatomical preparation of vessels on

the greater omentum with moderately and excessively developed adipose tissue has been used. Subsequently, to examine the vessels, the preparations of the greater omenta were placed on the negatoscope, then photographed and the value of the parameters of the length and outer diameter of vessels and branches at the point of their origination from the main vessels was measured using a caliper. The study was performed in compliance with the basic bioethical provisions of the Council of Europe Convention on Human Rights and Biomedicine (04.04.1997), the Helsinki Declaration of the World Medical Association on the ethical principles of human research (1964–2008), and the Order of the Ministry of Health of Ukraine No. 690 as of September 23, 2009.

To determine the arithmetic mean and mean deviation of the parameters of the length and outer diameter of the vessels and their branches, statistical processing of the obtained data was performed using the Microsoft Excel 2010. The nonparametric Mann-Whitney test was used to determine the statistical significance of differences between the groups. The difference was considered statistically significant at $p < 0.05$.

Results of the study and their discussion. Macroscopically, the right gastro-omental artery was detected in all 20 preparations and the left gastro-omental artery was detected in 90 % (18 cases out of 20) on the secured part of the greater omentum. The right and left gastro-omental arteries anastomose with each other on the secured part of the greater omentum in the area of the greater curvature of the stomach at the border of the middle and upper thirds of its curvature in 83 % (15 cases out of 18), forming the superior arterial arch of the greater omentum. No anastomosis with the left and right gastro-omental arteries was noted in 3 (16 %) out of 18 cases in the presence of the above part of the greater omentum. Numerous branches originated from both arteries and run to the greater curvature of the stomach. On the greater omentum from female and male cadavers, the length of the right gastro-omental artery ranged from 14.5 to 38 cm and from 10.6 to 26 cm, respectively, and its diameter was 0.16 - 0.38 cm and 0.2–0.32 cm, respectively. In addition, 3 to 12 branches commonly arise from the right gastro-omental artery. These branches ascended by 2–4 cm along the anterior wall of the stomach, entering its depth. Subsequently, we have found that both female and male greater omentum was supplied with blood by the omental arteries, bifurcated from the right or left gastric arteries, when they were located in the area of the lesser curvature of the stomach in 25 % (5 cases out of 20). The analysis of our own studies enabled to distinguish the following omental branches of the right gastro-omental artery: the central artery, the right medial artery, the right intermediate artery, the right lateral artery, the left extra artery. The central omental artery was found in 85 % (17 cases out of 20) and was located in the middle of the greater omentum (fig. 1).



Fig. 1. Anatomical preparation of the greater omentum of elderly people. 1– the right gastro-omental artery; 2– the stomach; 3– the left gastro-omental artery; 4– the left medial artery; 5– the central artery; 6– the right medial artery; 7– the right lateral artery.

This artery originated from the right gastro-omental artery at an angle of 85° – 90° , running to the lower edge of the unsecured part of the omentum. It was observed that the right lateral branch of the central omental artery anastomosed with the right medial omental artery (1 case), and in two cases the left lateral branch anastomosed with the left lateral omental artery (the branch of the left gastro-omental artery) and with the left medial omental artery (the branch of the left gastro-omental artery) in one case. On the greater omentum from female and male cadavers, the length of the central omental artery ranged from 16.2 to 30 cm and from 17 to 25.7 cm, respectively, and the diameter ranged from 0.12 to 0.22 cm and 0.13 to 0.29 cm, respectively.

On the greater omentum from female and male cadavers, the length of the right medial artery ranged from 6 to 31.5 cm, and from 17 to 25.7 cm, respectively, and the diameter ranged from 0.11 to 0.13 cm and 0.13 to 0.29 cm, respectively. The right medial artery was located by 2–3 cm to the right of the central omental artery, arose at an angle of 60° – 80° from the right gastro-omental artery, running to the lower edge of the unsecured part of the omentum. The right medial artery gave rise to the branches in the middle third of the length of the omentum, and its terminal branches arose from the lower edge of the unsecured part of the greater omentum. In 2 cases, the right medial artery anastomosed with the right lateral artery in the right area of the unsecured part of the greater omentum in its middle third.

The right intermediate artery was found in 45 % (9 cases out of 20) on the greater omentum from the elderly subjects. On the female and male greater omenta, the length of the right intermediate artery

ranged from 13 to 27.3 cm and 13.2 to 22 cm, respectively, and the diameter was 0.11 cm and 0.1 to 0.14 cm, respectively.

The right lateral artery was found in 70 % (14 cases out of 20) on the greater omentum from the elderly subjects. On the female and male greater omenta, the length of the right lateral artery ranged from 7.5 to 18.8 cm and 8 to 16.5 cm, respectively, and the diameter was 0.1–0.11 cm and 0, 1–0.12 cm, respectively.

In two cases, on the female greater omentum it was observed that the right gastro-omental artery gave rise to the left extra arteries. In the first case, the left extra artery was located on the left half of the greater omentum by 3 cm laterally to the central artery and anastomosed with the left lateral artery (the branch of the left gastroesophageal artery). In the second case, the central omental artery was absent, and the left extra artery ran along the left half of the entire length of the omentum to its lower edge, where it ended. The length of the left extra arteries ranged from 18 to 21.5 cm, and the diameter was 0.11 to 0.13 cm.

The left gastro-omental artery was absent on the anterior plate of the greater omentum in 10 % (per 1 case in women and men). Being located in the depth of the posterior surface of the secured part of the great omentum, the left gastro-omental artery also gave rise to 7–13 gastric branches. On the greater omenta of female and male cadavers, the length of the left gastro-omental artery ranged from 11 to 20.5 cm and 8 to 16 cm, respectively, and the diameter ranged from 0.12 to 0.21 cm and 0.13 to 0.24 cm, respectively. Our own observations enabled to distinguish the following branches of the left gastro-omental artery: left medial artery, left intermediate artery, left lateral artery. The left medial artery was found in 89 % (16 cases out of 18), the left intermediate artery in 33 % (6 cases out of 18), and the left lateral artery in 89 % (16 cases out of 18). These branches arose at an angle of 45°–70° from the left gastro-omental artery, branching into numerous fine arterial vessels in the left upper and middle parts of the greater omentum. The left medial, intermediate and lateral arteries do not reach the lower edge of the omentum.

On the greater omenta from female and male cadavers, the length of the left medial omental artery ranged from 8.5 to 29.5 cm and 8.5 to 28.2 cm, respectively, and the diameter ranged from 0.12 to 0.18 cm and 0.11 to 0.14 cm, respectively.

Mostly, in 77 % (14 cases out of 18), the left intermediate artery were absent on the greater omenta. If present on the female and male greater omenta, the arteries length ranged from 14.7 to 21 cm and 8.5 to 16.5 cm, respectively, and the diameter ranged from 0.11 to 0.12 cm and 0.11 to 0.12 cm, respectively.

On the female and male greater omenta, the length of the left lateral artery ranged from 6 to 25 cm and 7 to 27.2 cm, respectively, and its diameter ranged from 0.1 cm to 0.2 cm and 0.1 to 0.22 cm, respectively. In one of 18 cases, the left lateral artery anastomosed with the left medial artery in the left upper third of the unsecured part of the greater omentum. Notably, in two cases, when the left gastro-omental artery was located on the posterior surface of the secured part of the greater omentum, it gave rise, except for the left lateral artery, to no other branches.

In the first case, when originated from the left gastro-omental artery, the left lateral artery was located by 2 cm inward along the left edge of the anterior plate of the unsecured part of the greater omentum and branched into numerous fine arterial branches. Subsequently, the left extra artery (the branch of the right gastro-omental artery) entered the artery at the level of the left middle part of the greater omentum,

and then below at a distance of 3 cm the left lateral artery turned to the right and formed anastomosis with the central artery (the branch of the right gastro-omental artery) in the lower third of the unsecured part of the omentum.

In the second case, the left lateral artery was located medially and vertically of the left part of the anterior plate of the greater omentum, where it gave rise to two branches, ending in the depth of the left edge of the omentum.

Then the artery reached the middle of the lower part of the omentum and anastomosed with the right lateral artery (the branch of the right gastro-omental artery), forming the inferior arterial arch of the omentum on its anterior plate. Notably, no central artery was found on the greater omentum (fig. 2) and 3 omental branches originated from the left gastric artery were detected.



Fig. 2. The arteries of the elderly human greater omentum. 1 – the right gastro-omental artery; 2– the stomach; 3 – omental branches of the left gastric artery; 4 – the left lateral artery; 5 – inferior arterial arch of the greater omentum; 6 – the right lateral artery.

These branches descended to the left side of the anterior wall of the stomach, then anastomosed with each other in the left upper third of the secured part of the greater omentum, giving rise to the arterial branch, which bifurcated in the left middle part of the anterior plate of the greater omentum and supplied blood to it.

In addition to the above-mentioned branches, in 2 out of 20 cases the upper left part of the greater omentum was supplied with blood by the omental-splenic artery, originated from the splenic artery.

The resulting morphometric data showed that the central artery of the greater omentum from the elderly women and men had the highest value of the outer diameter and the length compared to the arterial branches listed above (table 1).

Table 1

The parameters of the vasculature of the human greater omentum M±m

Vessels	Parameters			
	Diameter, cm		Length, cm	
	women	men	women	men
Right gastro-omental artery	0.232±0.071	0.25±0.071*	21.16±13.65	16.35±8.301*
Central artery	0.138±0.029	0.177±0.095*	21.48±8.131	22.45±3.511*
Right medial artery	0.12±0.013	0.12±0.016*	18.43±13.08	19.3±0.019*
Right intermediate artery	0.11±0	0.12±0.016*	20±11.03	18.54±6.118*
Right lateral artery	0.102±0.0027	0.108±0.011*	12.96±8.126	12.978±5.72*
Left gastro-omental artery	0.176±0.054	0.193±0.048*	13.3±5.481	11.91±4.065*
Left medial artery	0.134±0.017	0.124±0.013*	16.729±15.03	17.87±9.21*
Left intermediate artery	0.115±0.003	0.115±0.008*	17.85±2.1	13.85±5.14*
Left lateral artery	0.116±0.0517	0.125±0.0563*	14.322±10.62	14.457±10.907*
Right gastro-omental vein	0.267±0.105	0.28±0.075*	21.16±13.65	16.35±8.30*
Central vein	0.1533±0.021	0.1938±0.106*	21.48±8.131	22.45±3.511*
Right medial vein	0.136±0.014	0.144±0.019*	18.43±13.08	19.36±0.019*
Right intermediate vein	0.127±0.003	0.136±0.009*	20±0.003	18.54±6.118*
Right lateral vein	0.124±0.0104	0.1267±0.019*	12.96±8.126	12.978±5.72*
Left gastro-omental vein	0.215±0.07	0.218±0.046*	13.3±5.481	11.91±4.065*
Left medial vein	0.151±0.019	0.1411±0.017*	16.729±15.03	17.87±9.213*
Left intermediate vein	0.135±0.003	0.1325±0.007*	17.85±2.1	13.85±5.14*
Left lateral vein	0.1344±0.059	0.1486±0.0645*	14.322±10.62	14.457±10.907*

* – the reliable difference between women and men makes up $p < 0.05$.

In our opinion, such anatomical features of the vascular topography, variations of branching and formation of anastomosis are of practical importance during surgical interventions on the greater omenta in their pathology and in reconstructive surgery, when a graft is cut from the greater omentum for transplantation to an organ with defects.

There are facts in the literature that indicate that the greater omentum of the elderly people has a quadrangular, triangular and multi-lobe shape. The quadrangular omentum had a width of 25 to 35 cm, which exceeded their length (17.5–27 cm). Triangular-shaped greater omentum are rare and have a wide base and a narrow tapered lower edge, and their length is from 25 to 37 cm, width is 22.5–29.4 cm. The length of irregularly shaped omentum ranged from 14 to 30 cm, and a width of 28 cm (the smallest) to 52 cm (the largest). The quadrangular shape of the greater omentum is more favorable for obtaining a graft with elongation for transplantation to organs with a large defect [6]. We also verified the above shapes of the greater omentum of the elderly people in 45 % (9 cases out of 20) as quadrangular, in 15 % (3 cases out of 20) as triangular and in 40 % (8 cases out of 20) of irregular shape with two or more lobes.

The analysis of our own studies showed that the left and right halves of the quadrangular greater omental had the same blood supply, which was provided by the right and left gastro-omental arteries and their branches. In the greater omental of irregular shape with two lobes more favorable blood supply was found in the right half of the greater omentum. The upper left part of the greater omentum had a more optimal blood supply in the presence of the omental-splenic artery. From the triangular-shaped greater omentum it is possible to obtain a short autograft and a longer one from the quadrangular-shaped greater omentum.

In our opinion, to obtain the graft from the greater omentum, both its shape and the length and diameter of the vessels should be taken into account. The central artery (a branch of the right gastro-omental artery) of the greater omentum from female and male cadavers had a larger length and outer diameter compared to the studied arteries and in its absence the right and left medial arteries in men and the left and right intermediate arteries in women.

The right gastro-omental artery is a branch of the gastroduodenal artery, and the left gastro-omental artery arises from the splenic artery [1, 4]. The facts of anastomoses described by us are confirmed by the data of other authors [4, 5]. Sttembre N. [9] reports that the average length of the right right gastro-omental artery is 244.3 ± 34.4 mm, and the diameter is 2.68 ± 0.39 mm. The diameter of the right gastro-omental artery is ≥ 3 mm at the beginning and 1.5–2 mm at the level of the middle of the greater curvature of the stomach [10].

Some authors [6] highlight the omental branches of the posterior plate of the unsecured part of the greater omentum anastomose with the middle colic and inferior pancreatic arteries. However, our studies found no anastomoses. Instead, we observed anastomoses between the arterial branches of the anterior and posterior plates when conjoined.

The pathway of the veins of the greater omentum was similar to the pathway of the arteries. Each artery was accompanied by one vein. Veins were formed from the conjoining of numerous fine branches that arose from the depth of the lower and middle areas of the unsecured part of the greater omentum. In these areas, the venous branches had a transverse pathway, they conjoined and gave rise to the central, right medial, intermediate and lateral veins of the right half of the omentum. Respectively left medial, intermediate and lateral veins were formed in the left part of the greater omentum. The outer diameter of the veins is wider than the diameter of the arteries. Table 1 presents the average values of the parameters of the veins. Then the veins ascended along with the anterior plate of the unsecured part of the greater omentum to the upper edge of the secured part of the omentum and formed the right and left gastro-omental veins, which were located parallel to the greater curvature of the stomach. The right gastro-omental vein flowed into the superior mesenteric vein, and the left one into the splenic vein.

Conclusions

1. In the elderly people, the blood supply to the greater omentum is provided by the right and left gastro-omental arteries. These arteries anastomose and form the superior arterial arch on the secured part of the greater omentum in 15 out of 18 cases and in 3 out of 18 cases the arteries did not anastomose at all. The left gastro-omental artery in 2 of 20 cases was absent on the anterior plate of the greater omentum. The lower edge of the unsecured part of the omentum had the arterial arch in 1 out of 20 cases.

2. The right gastro-omental artery give rise to the central, right medial, intermediate and lateral arteries and left extra artery (in 2 out of 20 cases). The central artery has a length of 21.49 ± 8.1 cm, an outer diameter of 0.14 ± 0.029 cm in women and 22.45 ± 3.5 cm and 0.17 ± 0.09 cm in men, respectively. The branches of the right gastro-omental artery supply blood to the right half of the greater omentum and reach the lower edge of the unsecured part of the omentum. The left extra artery branches supply blood to the left half of the omentum. The left gastro-omental artery bifurcates into the left medial, intermediate and lateral arteries. These arteries branch into the depth of the left half of the omentum and supply blood to it without reaching the lower edge of the unsecured part of the omentum. The upper left area of the omentum can be supplied with blood by the splenic-omental artery, which arises from the splenic artery in 2 out of 20 cases.

3. Veins, compared to arteries, have bigger external diameter and one vein accompanies an artery of the same name. The topography of the omental veins is similar the topography of the omental arteries. Venous blood outflows from the greater omentum into the portal vein system through the superior mesenteric and splenic veins.

4. The greater omenta of quadrangular, triangular and irregular shape with two or more lobes were found in 45 %, 15 % and 40 %, respectively. The area of the central artery, and in case of its absence – the right and left medial arteries of the greater omentum is more favorable for obtaining the graft for transplantation in the quadrangular and triangular shapes of the greater omentum of the elderly people.

References

1. Guseynov TS, Guseynova ST, Suleymanova RG, Atayeva DA, Khalilov MA. Osobennosti anatomii bolshogo salnika. 2018; [tsitovano 2021 Marta 11]; (6): 16–8. doi:10.24411/2075-4094-2018-16276 [in Russian]
2. Kamynin YuV, Proshchenko YaN, Fayzulayev VKh, Zuyev ME. Idiopaticheskiy segmentarnyy infarkt bolshogo salnika u rebenka. Detskaya khirurgiya. 2015; 19 (4): 51–3. [in Russian]
3. Konopliitskiy VS, Pogoriliy VV, Fomin OO, Ksonz IV, Yakimenko OG, Gorbatiuk LV, ta in. Torsiyna patologiya velikogo cheptsa u ditey: oglyad literaturi ta vlasni klinichni sposterezheniya. Khirurgiya dityachogo viku. 2019; 2 (63): 84–91. DOI 10.15574 / PS.2019.63.84 [in Ukrainian]
4. Shevlyuk NN, Khalikova LV, Khalikov AA. Morfofunktsionalnaya kharakteristika bolshogo salnika. Zhurnal anatomii i gistologii. 2020; 9 (2): 90–9. [in Russian]

5. Fedorchenko IL, Stepanchuk AP. Zovnishnya budova velikogo cheptsya lyudini u vikovomu aspekti. Aktualni problemi suchasnoyi meditsini: Visnik Ukrayinskoyi medichnoyi stomatologichnoyi akademiyi. 2020; 20 (3 (71)): 222–8. [in Ukrainian]
6. Khodov NA. Klinicheskaya anatomiya bolshogo salnika. Molodoy uchonyy. 2018 Dekabr; (51): 76–80. [in Russian]
7. Gupta R, Farhat W, Ammar H, Azzaza M, Lagha S, Cheikh Y, et al. Idiopathic segmental infarction of the omentum mimicking acute appendicitis: A case report. Int J Surg Case Rep. 2019; 22 (5):18–20.
8. Kataoka J, Nitta T, Ota M, Takashima Y, Yokota Y, Fujii K, et al. Laparoscopic omentectomy in primary torsion of the omentum: report of a case. Surg Case Rep. 2019; 5 (1): 76–8. <https://doi.org/10.1186/s40792-019-0618-5>
9. Settembre N, Labrousse M, Magnan PE, Branchereau A, Champsaur P, Bussani R, et al. Surgical anatomy of the right gastro-omental artery: a study on 100 cadaver dissections. Surg Radiol Anat. 2018 Apr; 40 (4): 415–422. <https://doi.org/10.1007/s00276-017-1951-7>
10. Suma H. Gastroepiploic artery graft in coronary artery bypass grafting. Ann Cardiothorac Surg. 2013 Jul; 2 (4): 493–8.

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O.I. Tiron, A.V. Stetsenko, O.I. Yatsyna¹, L.M. Zayats², A.O. Kolotvin, K.S. Shumilina
Odessa National Medical University, Odessa; ¹National Cancer Institute, Kyiv
²Ivano-Frankovsk National Medical University, Ivano-Frankovsk

THE MORPHOLOGICAL CHANGES OF THE WHITE RATS' THYROID GLAND 21 DAYS AFTER EXPERIMENTAL THERMAL BURN INJURY UNDER NaCl SYSTEMIC ADMINISTRATION

e-mail: chekina.o@ukr.net

The histological features of the experimental animals' thyroid gland 21 days after modelled burn injury under NaCl systemic administration can be described as adaptive and compensatory processes in the follicular wall, vascular and stromal components. Most of the thyroid follicles were round or oval in shape, some of them were overstretched and filled with dense colloid. The follicular epithelial cells were flattened, contained pyknotic nuclei surrounded by thin layer of cytoplasm. In some regions it was observed the desquamation of the thyrocytes within the follicular lumen. The electron microscopic examination of the gland 21 days after modelled burn confirmed the changes that had been previously established by the analysis of histological specimens. The flattened thyrocytes contained osmiophilic nuclei with heterochromatin. Their cytoplasm was electron lucent and contained organelles exhibiting the signs of destruction. The microvilli were observed on the apical domain of thyrocytes. Along with the follicles with altered histological structure (which indicates an imbalance in the synthesis and excretion of hormones) there were observed the follicles with intact wall and unaffected blood supply. The ultrastructure of the latter indicates active protein-synthesizing and protein-secreting processes.

Keywords: burn injury, thyroid gland, light microscopy, electron microscopy.

O.I. Тірон, А.В. Стеценко, О.І. Яцина, Л.М. Заяць, А.О. Колотвін, К.С. Шуміліна **МОРФОЛОГІЧНІ ЗМІНИ ЩИТОПОДІБНОЇ ЗАЛОЗИ БІЛИХ ЩУРІВ ЧЕРЕЗ 21 ДОБУ ПІСЛЯ ЕКСПЕРИМЕНТАЛЬНОГО ТЕРМІЧНОГО ОПІКУ ПРИ СИСТЕМНОМУ ВВЕДЕННІ NaCl**

Гістологічні особливості щитовидної залози піддослідних тварин через 21 день після змодельованого опікового ушкодження при системному застосуванні NaCl можна охарактеризувати як адаптаційні та компенсаторні процеси в стінці фолікула, судинному та стромальному компонентах. Більшість фолікулів щитовидної залози були круглої або овальної форми, деякі з них були перерозтягнутими і заповнені щільним колоїдом. Клітини фолікулярного епітелію були сплюснені, містили пікнотичні ядра, оточені тонким шаром цитоплазми. У деяких регіонах спостерігали десквамацію тироцитів у просвіті фолікула. Електронно-мікроскопічне дослідження залози через 21 день після змодельованого опіку підтвердило зміни, які раніше були встановлені аналізом гістологічних препаратів. Сплюснені тироцити містили осміюфільні ядра з гетерохроматином. Їх цитоплазма була електронно прозорою і містила органели з ознаками руйнування. Мікроворсинки спостерігали на апікальній області тироцитів. Поряд із фолікулами зі зміненою гістологічною структурою (що свідчить про дисбаланс у синтезі та виведенні гормонів) спостерігалися фолікули з інтактною стінкою та неушкодженим кровопостачанням. Ультраструктура останнього свідчить про активні білково-синтезуючі та білково-секреторні процеси.

Ключові слова: опікова травма, щитовидна залоза, світлова мікроскопія, електронна мікроскопія.

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It is widely known that severe burn immediately subjects the human body to extreme stress which leads to a series of immunological, neuroendocrine and metabolic reactions [11, 13]. Although the initial response to severe burn is typically characterized by hypometabolism, this state quickly (72–96 hrs) changes to hypermetabolism [4, 7]. The post-burn hypermetabolism is believed to be caused by the