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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

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გამოიცემა თბილისის სახელმწიფო სამედიცინო უნივერსიტეტთან
თანამშრომლობითა და მისი პატრონაჟით

ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

ТБИЛИСИ - НЬЮ-ЙОРК

GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board and The International Academy of Sciences, Education, Industry and Arts (U.S.A.) since 1994. **GMN** carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

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GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией и Международной академией наук, образования, искусств и естествознания (IASEIA) США с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения.

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GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

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При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

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2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

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ავტორთა საყურადღებოდ!

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1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

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6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

Содержание:

SONOGRAPHY OF THE FACE AND NECK REGION SOFT TISSUES IN ASSESSMENT OF THE COMPLICATIONS CAUSES AFTER FACIAL CONTOURING

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The annual growing number of injection procedures in aesthetic medicine inevitably leads to increasing of the complications, occurring after injections. According to the data of American Society of Aesthetic Plastic Surgery (ASAPS), there were more than 2,344,000 non-surgical procedures in 2018, 795 of which were accounted for fillers [1]. The echo signs of cosmetic agents were described in experimental studies, in order to assess the correlation of the obtained data with the chemical composition of the material [2-4]. To establish the chemical composition according to ultrasonography (US) and the injection of hyaluronidase agents, in the reviews, devoted to the diagnosis and treatment of complications after facial contouring, the emphasis is also on the analysis of the characteristics of the introduced material [5-8]. The studies devoted to comparing the results of US with the tomographic radiology methods diagnostics were published [9,10]. The analysis of the causes and structure of complications, location, the depth and the area of the pathological process in patients with complications after facial contouring, the relationship of clinical appearance with the presence of the filler, which is important for the correct diagnosis and determination of the patient treatment tactics, is the interest.

The aim of the study was to assess the capabilities of high-resolution US in the diagnosis of complications after facial contouring.

Material and methods. The US examination of 132 women after facial contouring at different stages of treatment was performed. The patients age ranged from 22 to 65 years. In this group, patients had been injected at various terms. The injections had taken place from 2 weeks to 15 years before the US examination.

The US cases presented in this article were performed with the «MyLab Twice» machine (Esaote, Italy) using linear probes that range between 15 to 18 MHz and 10 to 22 MHz, in B-mode (gray-scale) and color or power Doppler mode. No special preparation for the examination of the skin and face and neck soft tissues was required. US was performed while a patient was lying on his back.

At the first stage, the searching of subcutaneous fragments of the gel, the clear determination of their location relative to the anatomical structures of the facial skeleton and the depth from the epidermal layer of the skin of the face and neck were performed during US examination. Then, longitudinal and transverse sizes of filler bolus and its volume were measured, the relationship between the anatomical structures (vessels, facial muscles, septa) and filler deposits were assessed.

The structure of the studied object (hyperechoic, hypoechoic or anechoic formation; homogeneous or heterogeneous; the shape and the clarity of the contours, the presence or absence of a capsule or perifocal edema) was depicted in the description. Also the deviations of normal surrounding tissues were described: increased pastiness (dermis, hypodermis, the presence or absence of the vascularization, excessive fibrosis and other features.

Obtained by the history taking and US examination quantitative and qualitative data were exported to Excel tables and processed by Statistica 10 and MS Office Excel 2010 programs. The normal distribution test (Shapiro-Wilk test) was carried out for quantitative parameters. The statistical significance of the differences between the compared parameters was determined by Student t-test number in the case of normal distribution. The parameters were presented as the median (Me) and 25%- and 75%-percentiles in the case of the absence of normal distribution. The medians comparison was performed with Mann Whitney U-test. The ratio of patients with the different qualitative indications was compared by the analysis of fourfold contingency tables on the basis of chi-squared test, Yates corrected chi-square test, Fisher's exact test. If the probability of error was less than 0.05 (<0.05) the differences between the compared pairs were considered as statistical significant.

The chemical characteristics of fillers and the terms of the treatment of patients after injection procedures were presented in Figs 1 and 2.

The chemical characteristic of injected materials according to anamnesis data (n=132)

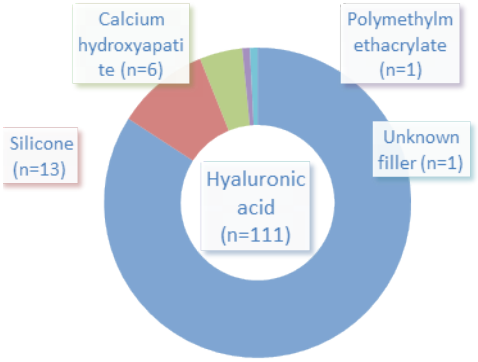

Fig. 1. HA fillers were injected in 111 cases (84,1%), in 13 cases (9,8%) – silicone, in 6 cases (4,5%) – calcium hydroxyapatite (CaHA), polymethylmethacrylate (PMMA) – in 1 (0,8%). There was 1 patient with non-hyaluronic filler with unknown genesis (0,8%)

The terms of treatment after the filler injection (n=132)

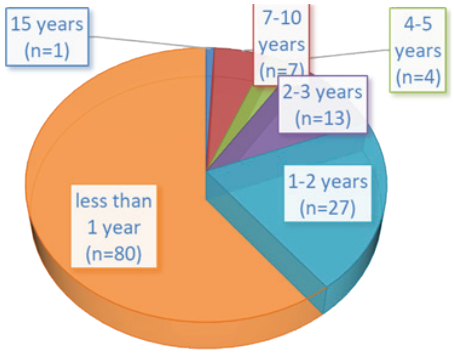

Fig. 2. The terms of treatment after the filler injection in 7 cases (5,3%) were from 7 to 10 years, in 4 cases (3,0%) - 4-5 years, in 13 cases (9,8%) – 2-3 years, in 27 (20,5%) – from 1 to 2 years, in 80 (60,6%) – from 2 weeks to 1 year. In 1 case (0,8%) the patient turns 15 years after the injection of non-hyaluronic filler

Results and discussion. The distribution of patients' complaints was as follows: dissatisfaction with the aesthetic result in 122 (92.4%) cases, patients expressed concern about the excess of the declared time spent into the tissues of the injected drugs in 10 (7.6%) cases. The characteristic structure of complaints of patients dissatisfied with the aesthetic result was presented in Fig. 3.

The structure of the complaints of patients, who were dissatisfied with the aesthetic result (n=122)

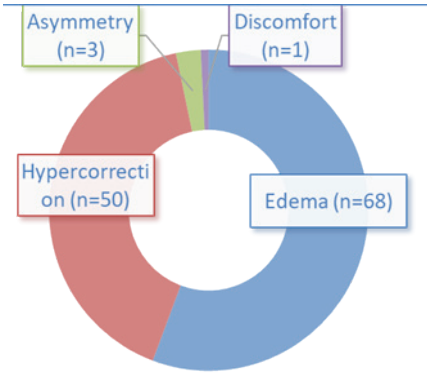

Fig. 3. Edema - 68 cases (55,7%), hypercorrection – 50 cases (41%), asymmetry - 3 cases (2,5%), discomfort - 1 case (0,8%)

According to the US examination data, the most common location area of fillers or echo signs of fibrotic changes in the projection of previously introduced agent were nasolacrimal and palpebromal grooves – 54 cases (40.9%), and the area of lips and nasolabial folds – in 52 (39.4%) cases (Tab. 1). The echo signs of fibrotic changes into the head and neck soft tissues were revealed in 66 patients (50.0%), which corresponded to the location of complaints of edema and hypercorrection in 22 (16.7%) cases. The fibrosis changes were identified at the site of filler injection in 5 patients (3.8%), who were interested in the excess period of the agent, in other 39 cases (29.5%) it was an accidental finding into adjacent anatomical areas that weren't clinically apparent and didn't disturb the patient. The filler has adjoined to the vessels in 36 cases (27.3%), requiring surgical treatment granulomas has formed in 2 cases (1.5%).

The dilated vessels with the fragments of fillers in the form of small boluses were visualized at the site of its injection in 3 cases (2.3%). The swelling of hypodermis and dermis without any fillers or echo signs of fibrosis was identified in 4 cases (3.0%). 1 patient didn't have any changes into the soft tissues (0.8%). The agent was located into the infraorbital region in 51 patient (38.6%), which didn't correspond to the site of the injection and the complaints. The US structure of the manifestations of edema and hypercorrection in patients with corresponding complaints was shown in Figs 4, 5.

US structure of edema

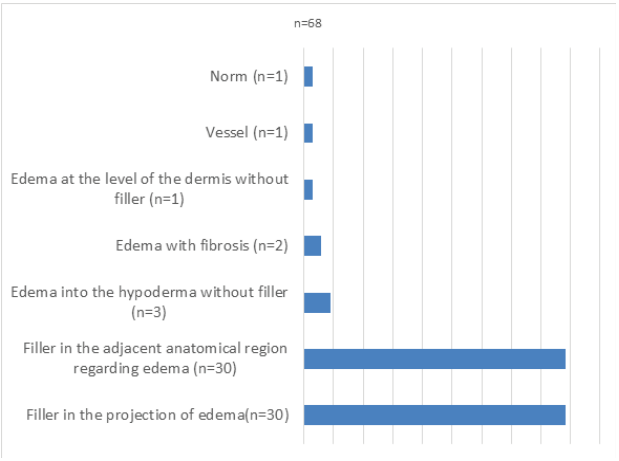

Fig. 4. Hypodermis with the filler into it was revealed in 30 patients. The same pathology without filler in the projection of it was diagnosed in 30 cases, and the agent was visualized in adjacent anatomical regions. Hypodermis edema in 3 cases and dermis edema in 1 case didn't have the filler into them. Hypodermis and dermis edema was combined with fibrosis in 2 cases. The enlarged vessel with an agent microbole, which the patient perceived as edema, was detected in one study. One patient showed no signs of tissue changes and the presence of a filler

US structure of the hypercorrection

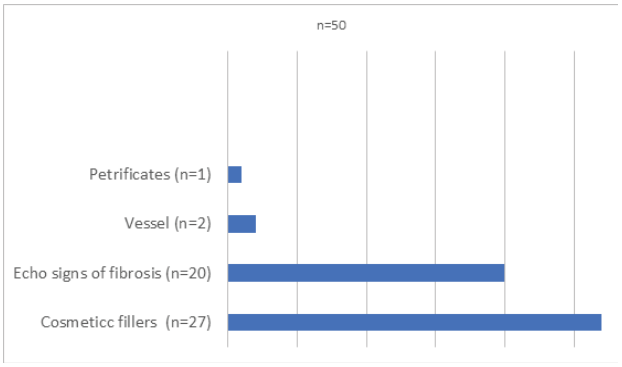

Fig. 5. The hypercorrection corresponded to the echo signs of the fibrotic changes in the form of hyperechoic formations with clear, uneven contours in 20 cases and in the form of the petrificates - in 1 case. The hypercorrection was visualized as the hypoechoic and anechoic formations with clear even contours, which was typical for echo signs of the fillers in 27

Table 1. Location of the cosmetic fillers and echo signs of fibrosis into the soft tissues of head and neck according to the US data

Region	%	Number of patients (n=132)
Nasolacrimal and palpebromolar fissure	40,9	54
Lips and nasolabial folds	39,4	52
Zygomatic bone	9,8	13
Lack of filler and ultrasound signs of fibrosis	3,8	5
Frontal	1,5	2
Temporal	1,5	2
Neck	1,5	2
Mental	0,8	1
In the salivary gland	0,8	1

cases. The vessels with the agent microboles were revealed into palpebromolar grooves in 2 patients. They didn't seem to differ from the manifestations of hypercorrection but according to the spectrum of blood flow they were veins

The examples of different patients with the same complaints about the edema were presented in the Figures 6 and 7. There, the case when into same anatomical zone, with the same complaints and similar clinical appearance, the ultrasound picture is different, was clearly presented.

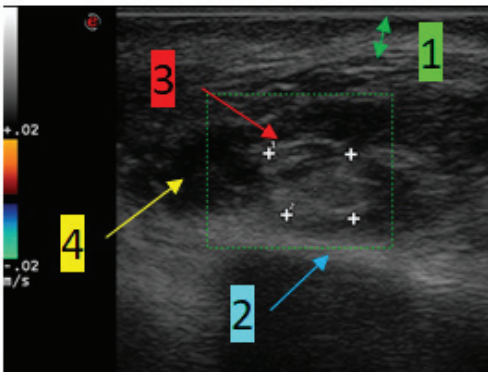

Fig. 6. Sonogram of the periorbital region in Color Doppler mode in the projection of the nasolacrimal groove, sagittal plane at the level of the bone edge of the orbit (arrow 1 – dermis, arrow 2 – bone). Hyperechoic, avascular rounded formation with clear even contours was visualized supraperiostally (arrow 3 – hyperechoic formation), with the signs of severe perifocal edema in the form of a zone of reduced echogenicity (arrow 4 - edema). Echo signs of fibrosis in the projection of the nasolacrimal groove and of the periorbital region soft tissues edema

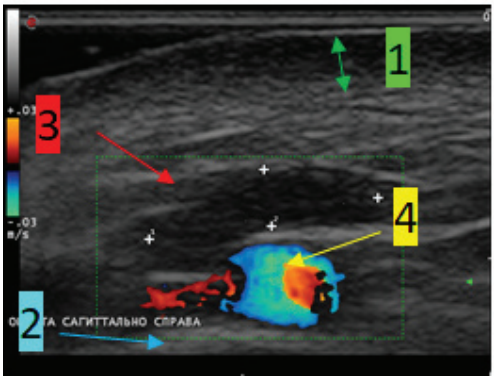

Fig. 7. Sonogram of the periorbital region in Color Doppler mode in the projection of the nasolacrimal groove, sagittal plane at the level of the bone edge of the orbit (arrow 1 – dermis, arrow 2 – bone). Hypoechoic avascular formation of an oblong shape with clear and even contours is visualized into the soft tissues of the examined area (arrow 3 – hypoechoic formation). It was adjacent to the vessel (arrow 4 - vein), the blood flow spectrum showed that in was vein, with no signs of tissue edema. Echo signs of adjacent to the vein cosmetic filler in the projection of the nasolacrimal groove

HA fillers in the patients who turned with complains during up to a year after the injection were visualized as round or oval shaped hypoechoic boluses with clear, fairly even contours in 65 cases, with the fibrous capsule – in 5 cases (Fig. 8). The areas of increased echogenicity soft tissues into the places of HA injection were revealed in 13 patients, who turned at the same time (Fig. 9). HA agents with a presence into the tissues for more than a year were visualized as hypoechoic formations without perifocal edema in 26 cases during US, the fibrous capsule was visualized among them in 6 cases (Fig. 10). The hyperechoic avascular formation was identified at the site on the hyaluronic filler injection in 2 cases, which corresponded to the echo signs of fibrosis. Polymethylmethacrylate was visualized during US as a heterogeneous formation due to the alternation of the areas of reduced and increased echogenicity, with a predominance of the hyperechoic structures, with an acoustic shadow in the patient to whom this agent was injected (Fig. 11). Silicone fillers were visualized as hyperechoic formations in 16 cases, as hypoechoic structures with hyperechoic capsule without any signs of the perifocal edema – in 5 cases (Fig. 12,13).

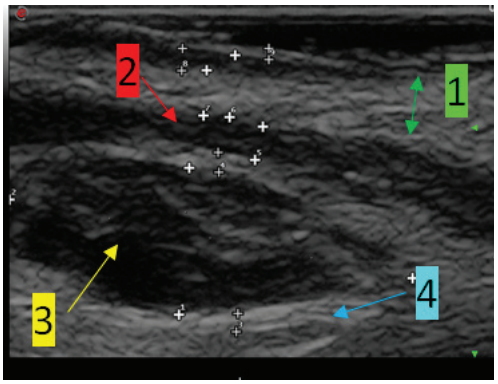

Fig. 8. Sonogram, B-mode, periorbital region in the projection of palpebromolar sulcus, horizontal plane at the level of the bone edge of the orbit along the mid-pupil line (arrow 1 – dermis, arrow 2 – m. orbicularis oculi). Hypoechoic, heterogeneous due to hyperechoic thickenings, filler bolus was visualized (arrow 3 - filler). It had clear even contours, was oval shaped, with fibrous capsule (arrow 4 – fibrous capsule) and located under the orbicularis oculi muscle, without signs of perifocal edema. Echo signs of incapsulated filler into periorbital region

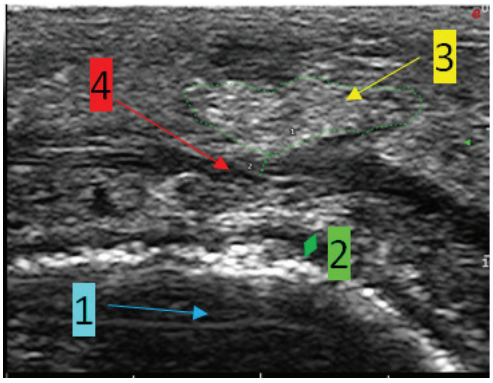

Fig. 9. Sonogram, B-mode, the lateral part of the upper lip, horizontal plane (arrow 1 – oral cavity, arrow 2 – submucosa). The hyperechoic formation (arrow 3 – hyperechoic formation) with clear uneven contours is visualized above the orbicularis oris muscle (arrow 4 – m. orbicularis oris). It was located at the site of HA filler injection. Echo signs of fibrotic changes into the soft tissues of the upper lip

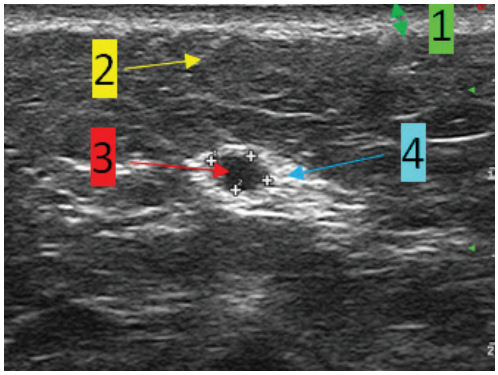

Fig. 10 Sonogram of the soft tissues in the projection of the left nasolabial fold (arrow 1 – dermis, arrow 2 – hypodermis). A hypoechoic HA filler bolus (arrow 3 - hypoechoic filler bolus) with a formed strongly marked hyperechoic capsule (arrow 4 – hyperechoic capsule) is visualized into hypodermis. The visualization of the underlying structures was not hindered. Echo signs of fibrotic changes into the nasolabial fold soft tissues

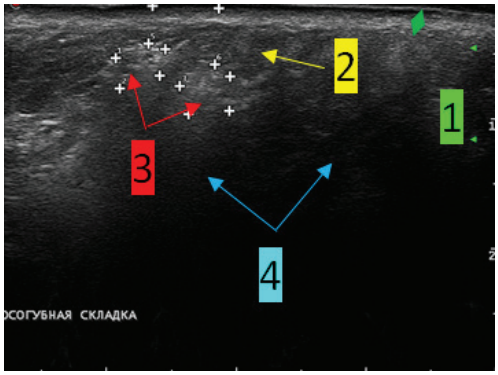

Fig. 11. Sonogram of the soft tissues in the projection of the left nasolabial fold (arrow 1 – dermis, arrow 2 – hypodermis). Hyperechoic structures (arrow 3 – hyperechoic structures) with an acoustic shadow (arrow 4 – acoustic shadow) was visualized into the nasolabial fold soft tissues at the site of the injection of the PMMA filler. Visualization of the underlying structures was not hindered. Echo signs of fibrotic changes into the nasolabial fold soft tissues

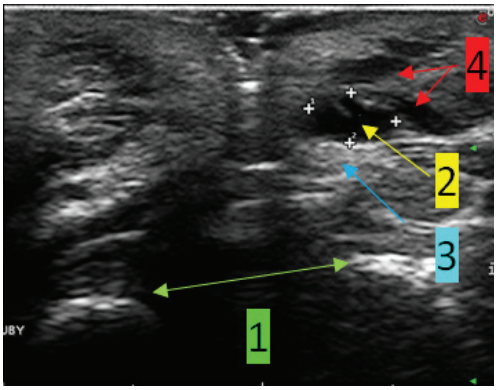

Fig. 12 Sonogram of the lips, sagittal plane (arrow 1 – teeth). An anechoic HA filler bolus (arrow 2 - the anechoic filler bolus), oval shaped, with clear and even contours, with dorsal echo enhancement (arrow 2 – dorsal filler enhancement) without a fibrous capsule or perifocal edema of the lower lip soft tissues was visualized. The lip soft tissues have had a typical structure, the visualization of the orbicularis oris muscle wasn't hindered (arrow 4 – m. orbicularis oris). Echo signs of iatrogenic inclusions of HA origin into the lower lip soft tissues

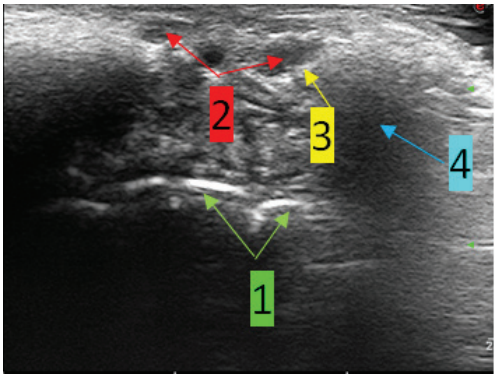

Fig. 13. Sonogram of the lips, sagittal plane (arrow 1 – teeth). The hypoechoic silicone filler boluses (arrow 2 – hypoechoic boluses), which was injected 8 years ago, oval shaped, with clear and even contours, with the fibrous capsule (arrow 3 – fibrous capsule) without a perifocal edema of the upper and lower lip soft tissues was visualized. The visualization of the upper and lower lip tissues had an atypical structure, visualization of the orbicularis oris muscle was hindered. There was also a posterior acoustic shadowing artifact caused by the superficial hyperechoic structures (arrow 4 – posterior acoustic shadowing artifact). Echo signs of fibrotic changes of the lips with encapsulated silicone filler fragments

Echo signs of fibrosis were revealed in 66 cases by the US examination, of which 27 cases were corresponded to the site of the filler injection. During the examination there were 39 cases of the random findings, which were not clinically apparent and didn't disturbed. The filler was located in the projection of the infraorbital foramen in 51 patients, but it wasn't corresponded to the site of the injection and the complaints. The analysis of the relationship between the sign of "filler dislocation" and its injection above or below the SMAS shows the strong correlation between the filler dislocation and it's injection below the SMAS ($p<0,05$). The agent dislocation was possible between the fascial spaces due to the facial muscles activity, which were the anatomical borders of the fascial spaces together with the ligamentous apparatus [11,12]. The filler was located in the projection of the edema and into the adjacent anatomical region in the patients with complaints of edema. Analysis data shown that there was no correlation between the presence of edema and the presence of the filler in its area ($p>0,05$).

According to the data analysis, materials of different nature at different duration of stay into the soft tissues may be sonographically similar. For example, silicone and HA visualized as anechoic boluses, both with the presence of hyperechoic rim and without it. The fibrous changes were revealed at the site of the injection of all materials, as well as the absence of signs of biodegradation at different stages after the injection. Medical history, the terms of stay of the material in the tissues, clinical appearance had the great importance and should be compared with the US characteristics of the material. Conservative treatment is recommended in the case of the presence of HA fillers, and if there are echo signs of fibrosis of non-HA agents, the issue about surgical treatment should be brought up.

The obtained data indicate the need for a preliminary examination of the face and neck soft tissues to determine the level of edema, the presence of the filler into the soft tissues, differential diagnosis of the complications' causes, and at the planning stage of cosmetic procedures.

Conclusions. The characteristic echo signs of HA agents include hypoechoic structure, even and clear contours, the absence of an acoustic shadow.

The characteristic echo signs of non-HA fillers include hyperechoic structure, uneven and unclear contours, with the presense of an acoustic shadow.

The US of the skin and the soft tissues of the face and neck region prescribed to the patients with complaints after facial contouring in order to carry out the differential diagnosis of their causes and to determine the treatment tactics.

The most frequent complaints that patients come with were edema and hypercorrection into the periorbital region for up a year after the HA filler injection.

There was the high probability of an agent dislocation if it is introduced below the SMAS level.

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SUMMARY

SONOGRAPHY OF THE FACE AND NECK REGION SOFT TISSUES IN ASSESSMENT OF THE COMPLICATIONS CAUSES AFTER FACIAL CONTOURING

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132 women after facial contouring on terms from 2 weeks to 15 years after filler injection were examined by sonography (US). They had complaints of the edema, hypercorrection, asymmetry, discomfort and anxiety about the excess of the terms that filler had spent into the soft tissues.

HA fillers were injected in 111 cases (84.1%), silicon agents – in 13 cases (9.8%), CaHA – in 6 (4.5%), PMMA – on 1 (0.8%) and one patient have had non-hyalouronic filler with unknown origin (0.8%). According to the US data, nasolacrimal and palpebromar fissures were the most common location of fillers or the echo signs of fibrotic changes in the projection of their injection – 54 patients, just like the lips region and nasolabial folds – 52 cases.

The US of the skin and the soft tissues of the face and neck region prescribed to the patients in order to carry out the differential diagnosis of complaints' causes, to determine the treatment tactics and for planning cosmetic procedures.

Keywords: sonography, complications of facial contouring, fillers, filler injections.

РЕЗЮМЕ

СОНОГРАФИЯ МЯГКИХ ТКАНЕЙ ЛИЦА И ШЕИ, ОЦЕНКА ПРИЧИН ОСЛОЖНЕНИЙ ПОСЛЕ КОНТУРИРОВАНИЯ ЛИЦА

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С помощью ультразвукового исследования (УЗИ) обследовано 132 женщины после контурной пластики лица на сроках от двух недель до 15 лет после введения филлеров с жалобами на отек, гиперкоррекцию, асимметрию, дискомфорт и беспокойство по поводу превышения сроков нахождения препаратов в мягких тканях.

В 111 (84,1%) случаях вводили филлеры на основе гиалуроновой кислоты, в 13 (9,8%) – силикон, в 6 (4,5%) – гидроксиапатит кальция, в одном (0,8%) – полиметилметокрилат, у одного (0,8%) пациента - филлер негиалуроновой природы неизвестного происхождения. По данным УЗИ наиболее частой областью локализации филлеров или ультразвуковых признаков фиброзных изменений в проекции их введения была область носослезной и пальпебромалярной борозд – 54 пациента, а также область губ и носогубных складок – 52 случая.

Пациентам с жалобами после контурной пластики лица показано ультразвуковое исследование кожи и мягких тканей для дифференциальной диагностики причин жалоб, определения тактики лечения и планирования косметологических процедур.

რეზიუმე

სახის და კისრის რბილი ქსოვილების სონოგრაფია, სახის კონტურირების შემდგომი გართულებების მიზეზების შეფასება

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სხივური დიაგნოსტიკის ცენტრალური სამეცნიერო-კვლევითი ინსტიტუტი, მოსკოვი, რუსეთის ფედერაცია

ულტრაბგერითი კვლევით შესწავლილია 132 ქალი სახის კონტურული პლასტიკის შემდეგ, ფილერების შეყვანიდან ორი კვირიდან 15 წლის ვადაში,ჩივილებით შეშუპებაზე, ჰიპერკორექციაზე, ასიმეტრიასა და დისკომფორტზე, ასევე, წუხილის გამო რბილ ქსოვილებში პრეპარატის არსებობის ვადების გახანგრძლივებასთან დაკავშირებით.

111 (84,1%) შემთხვევაში შეყვანილი იყო ფილერები ჰიალურონის მჟავას საფუძველზე, 13 (9,8%)შემთხვევაში – სილიკონი, 6 (4,5%) შემთხვევაში - კალციუმის ჰიდროქსიაპატიტი, 1 (0,8%) შემთხვევაში – პოლიმეთილმეტოკრილატი, 1 (0,8%) პაციენტს – უცნობი წარმოშობის არაჰიალურონული ბუნების ფილერი. ულტრაბგერითი კვლევის შედეგების მიხედვით, ფილერების ან ფიბროზული ცვლილებების ულტრაბგერითი ნიშნების ლოკალიზების ყველაზე ხშირ მიდამოს მათი შეყვანის პროექციაზე წარმოადგენდა ცხვირ-საცრემლე არხის მიდამო და წარბთშორისი ნაჭდევი – 54 პაციენტი, ასევე, ტუჩების და ცხვირ-ტუჩის ნაოჭის არე – 52 შემთხვევა.

კონტურული პლასტიკის შემდეგ ჩივილების მიზეზების დიფერენციული დიაგნოსტიკისათვის, მკურნალობის ტაქტიკის განსაზღვრისა და კოსმეტოლოგიური პროცედურების დაგეგმვისათვის ნაჩვენებია კანის და რბილი ქსოვილების ულტრაბგერითი კვლევა.

ASSESSMENT OF EFFECTS OF NON-FUNCTIONAL OVERREACHING AND OVERTRAINING ON RESPONSES OF SKELETAL MUSCLE AND CARDIAC BIOMARKERS FOR MONITORING OF OVERTRAINING SYNDROME IN ATHLETES

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In professional sports, the focus on success in training and competition creates a driving force for a higher level of fitness, which requires greater workload from athletes, longer sports season and greater frequency of competitions. Sports training program commonly comprises a component of repetitive overloading to initiate structural and functional changes in an attempt to achieve favorable adaptation to the workouts and enhance athlete's sports performance, but with an inadequate recovery time or an abrupt increase in training load, overloading may produce undesired effects. If overreaching is extreme and combined with an additional stressor, non-functional overreaching (NFO), and then overtraining syndrome (OTS) may result [12,13]. Because of imbalance between training and recovery, athletes are at risk of becoming overtrained, subsequently increasing the possibility of cardiac damage [9,16]. Early detection of NFO is very important in terms of prevention of overtraining, as well as for interruption of NFO/OTS progression.

Physiological, biochemical, immunological, psychological and performance markers of OTS are intensively investigated. During the last years, growing interest is set on biomarkers aiming at evaluating health-related aspects which can be modulated by regular physical activity and sport. The use of specific biochemical markers for the diagnosis of OTS are still in discussion. However, serum creatine phosphokinase (CK) has for years been measured and evaluated in exercise science as an essential parameter for the determination of muscular stress. Elevated baseline values of CK may indicate trauma or overtraining, also, its concentration can be used to monitor activity of athletes with a muscle injury [15].

Numerous studies have suggested that prolonged exercise may induce a transient appearance of cardiac-specific troponins (such as cTnI or cTnT), normally indicative of myocyte necrosis [14,17-20]. The troponin level post-exercise corresponds to release from the cytosolic compartment of cardiomyocytes. There are many causes of increased membrane permeability of cardiomyocytes and, among them, production of reactive oxygen species and imbalance between oxidative and antioxidant status is of growing interest. Other causes of permeability growth might be alterations in calcium, pH, glucose/fat metabolism or in communication between integrins, as well as various mechanisms can be suggested, among them increased cardiovascular stress, inflammation, vasculitis, dehydration, or expression of cardiac troponin in skeletal muscle [3,21]. However, "the presence of measurable troponin amounts in the blood should not be interpreted as cardiac damage in the absence of clinical symptoms or instrumental findings of myocardial disease" [1], such as alterations of echocardiographic parameters of systolic, diastolic or right-sided heart dysfunction. Results of previous studies about continuous ultraendurance activities were inconclusive in terms of appearance of cardiac-specific troponins in the blood. On the other hand, some studies on exercises like marathon and triathlon showed no increase in these markers [10]. Recent studies showed that cardiac troponin I and T were strongly correlated following exercise [7,8]. Therefore, with respect to abovemen-