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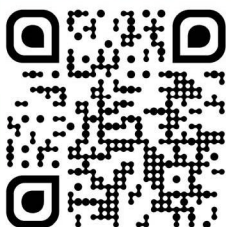
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2.	Arziev Ismoil Alievich TECHNIQUE AND FEATURES OF SURGICAL CORRECTION OF DAMAGE TO THE MAIN BILE DUCTS THAT OCCURRED INTRAOPERATIVELY.....	17
3.	Anarboev Sanjar Alisherovich IMPROVEMENT OF SURGICAL TREATMENT OF RECURRENT FORMS OF LIVER ECHINOCOCCOSIS.....	26
4.	Askarova Nafisa Rinatovna VULVARICOSITY: FEATURES OF DIAGNOSIS AND TREATMENT IN PATIENTS WITH VARICOSE VEINS AND PREGNANT WOMEN.....	33
5.	Akhmedov Rakhmatillo Furkatovich SURGICAL TACTICS FOR IATROGENIC INJURIES TO THE BILE DUCTS.....	38
6.	Achilov Mirzakarim Temirovich SURGICAL TREATMENT OF PANCREATIC HEAD TUMORS.....	44
7.	Allazov Iskandar Salakh ogli CYSTIC KIDNEY NEOPLASMS: RETROSPECTIVE ASPECTS AND MODERN VIEWS.....	49
8.	Allazov Salakh Allazovich LAPAROSCOPIC AND RETROPERITONEOSCOPIC OPERATIONS IN UROLOGY...	57
9.	Bobokulov Nurullo Asadovich, Ablyatifov Aziz Baxriyarovich OPTIMIZATION OF SURGICAL TREATMENT IN UROLOGY: THE ROLE OF SIMULTANEOUS LAPAROSCOPIC OPERATIONS.....	66
10.	Bakhriddinov Bekzod Rustamovich, Aliev Mansur Abduholikovich MR SPECTROSCOPY OF BRAIN TUMORS AND CORRELATION OF METABOLIC CHANGES WITH HISTOLOGICAL CHARACTERISTICS.....	72
11.	Davronov Alisher Uktamovich, Kurbaniyazov Bobojon Zafarjonovich LAPAROSCOPIC REPAIR OF PERFORATED ULCERS: ADVANTAGES AND CLINICAL OUTCOMES.....	79
12.	Daminov Feruz Asatullaevich, Bobokulov Azamat Uktamovich FACTORS IN THE DEVELOPMENT OF BLEEDING IN GASTRODUODENAL ULCERS. (LITERATURE REVIEW).....	88
13.	Davronov Oybek Otabek ugli MODERN VIEWS ON THE PATHOMORPHOLOGICAL ASPECTS OF CHANGES IN THE FORNICAL APPARATUS AND ADJACENT STRUCTURES DURING URINARY STONE DISEASE.....	95
14.	Egamberdiev Abdukakhkhor Abdukodirovich FEATURES OF SURGICAL TREATMENT OF HERNIA OF THE ESOPHAGEAL HOLE OF THE DIAPHRAGM.....	101
15.	Esirgapov Sardor Nursalimovich, Abduraxmanov Diyor Shukrullaevich RESULTS OF HERNIOPLASTY OF VENTRAL HERNIAS WITH ABDOMINOPTOSIS.....	106
16.	Gafarov Rushen Refatovich CLASSIFICATION OF POSTOPERATIVE COMPLICATIONS OF HOLMIUM LASER ENUCLEATION OF THE PROSTATE: ROLE OF A UNIFIED APPROACH.....	112
17.	Giyasova Nigora Kobilovna MODERN APPROACHES TO DETECTING ARTHROSIS AT EARLY STAGES AND POSSIBILITIES OF PATHOGENETIC TREATMENT OF THIS DISEASE.....	118

18.	Ishmuradov Bakhron Tursunovich EFFICACY OF ENDOSCOPIC BALLOON DILATION IN TREATMENT OF ACQUIRED URETERAL STRICTURES.....	127
19.	Islomov Nuriddin Komil ugli, Mustafakulov Ishnazar Boynazarovich, Julbekov Komil Islomovich MANAGEMENT FOR SIGMOID VOLVULUS.....	131
20.	Ismati Amir Olimovich, Mamarajabov Sobirjon Ergashevich, Anosov Viktor Davidovich A NOVEL PROGNOSTIC SYSTEM FOR 30-DAY MORTALITY IN PATIENTS WITH ULCER UPPER GASTROINTESTINAL BLEEDING.....	141
21.	Jalilov Khusan Mukhidinovich, Mansurov Jaloliddin Shamsiddinovich PREOPERATIVE INCIDENCE OF DEEP VEIN THROMBOSIS AFTER HIP FRACTURES IN KOREANS.....	151
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24.	Kurbaniyazov Zafar Babajanovich, Mukhiddinov Bobur Khuroz Ugli, Askarov Pulat Azadovich EVALUATION OF THE EFFECTIVENESS OF ARTIFICIAL INTELLIGENCE IN LAPAROSCOPIC CHOLECYSTECTOMY.....	168
25.	Khaidarov Numon Bozor ugli, Rakhmanov Kosim Erdanovich IMPROVEMENT OF SURGICAL TREATMENT OF PATIENTS WITH DESTRUCTIVE PANCREATITIS.....	175
26.	Khalimova Zamira Yusufovna, Narimova Gulchehra Jumaniyazovna, Kurbanova Sitora Shukhratovna, Ablakulova Munisa Xamrakulovna INTERACTION BETWEEN MELATONIN AND METABOLIC PARAMETERS IN OBESE WOMEN: A CLINICAL ANALYSIS.....	181
27.	Khurazov Ganisher Mususrmonovich MODERN APPROACHES TO TREATING PROSTACH ADENOMA: EFFICIENCY, SAFETY, AND IMPACT ON PATIENTS' LIFE QUALITY.....	190
28.	Khursanov Yokubjon Erkin ugli, Sattorov Abbos Xalilovich EFFICIENCY OF USING MINIMALLY INVASIVE METHODS IN THE SURGICAL TREATMENT OF COMPLICATED ACUTE CHOLECYSTITIS.....	196
29.	Khamrakulov Shokhrukh Farukhovich, Mamarajabov Sobirzhon Irgashevich, Rasulov Khamidulla Abdullaevich LAPAROSCOPIC TREATMENT OF STRICTURED HERNIAS OF THE ANTERIOR ABDOMINAL WALL.....	201
30.	Khodjimatom Gulomidin Minkhodzhievich, Yigitov Ayubkhon Azizbekovich, Yahyoev Sardorbek Mamasobir ugli IMPROVING THE OUTCOMES OF TREATMENT OF COMBINED SURGICAL DISEASES OF ABDOMINAL ORGANS USING SIMULTANEOUS LAPAROSCOPIC SURGERIES.....	207
31.	Khaidarov Numon Bozor ugli, Rakhmanov Kosim Erdanovich IMPROVEMENT OF SURGICAL TREATMENT OF PATIENTS WITH DESTRUCTIVE PANCREATITIS.....	217

32.	Khamdamov Olim Dilmurodovich, Rakhmanov Kosim Erdanovich OPTIMIZATION OF TACTICAL AND TECHNICAL ASPECTS OF SURGICAL TREATMENT OF PULMONARY ECHINOCOCCOSIS.....	223
33.	Khashimov Rustam Uktamjanovich, Rizaev Jasur Alimjanovich, Rakhmanov Kosim Erdanovich IMPROVEMENT OF SURGICAL TREATMENT OF PATIENTS WITH INGUINAL HERNIAS.....	229
34.	Mamanov Muhammad Chorievich IMPROVEMENT OF SURGICAL TACTICS IN COMPLICATED AND COMPLEX FORMS OF LIVER ECHINOCOCCOSIS.....	235
35.	Mamatov Karim Saidullaevich, Rakhmanov Kosim Erdanovich EFFECTIVENESS OF MINIMALLY INVASIVE METHODS IN SURGICAL TREATMENT OF CHOLANGITIS.....	243
36.	Mardonov Bobosher Amirovich. SURGICAL TACTICS FOR POSTCHOLECYSTECTOMY SYNDROME: FEATURES AND CHALLENGES OF IMPLEMENTATION.....	249
37.	Mukhiddinov Temur Djakhangirovich, Askarov Pulat Azadovich IMPROVEMENT OF SURGICAL TREATMENT OF VENTRAL HERNIAS WITH CONCOMITANT PATHOLOGY OF ABDOMINAL ORGANS.....	256
38.	Mansurov Jalolidin Shamsidinovich COMPARISON OF ULTRASOUND-GUIDED HYDROSTATIC REDUCTION OF INTUSSUSCEPTION RESULTS BETWEEN PEDIATRIC AND NON-PEDIATRIC RADIOLOGISTS AND RESIDENTS.....	262
39.	Musoyev Sodikjon Toirovich MODERN ALGORITHMS FOR THE TREATMENT OF ACUTE AND CHRONIC CHOLECYSTITIS: FROM CONSERVATIVE THERAPY TO SURGERY.....	273
40.	Negmatov Ismatillo Savridinovich CT DIAGNOSTICS, CLASSIFICATIONS, AND DEVELOPMENT OF A REPORTING TEMPLATE FOR ACUTE DIVERTICULITIS OF THE COLON.....	279
41.	Normamatov Bakhriddin Pirmamatovich, Rakhmanov Kosim Erdanovich OPTIMIZATION OF COMPREHENSIVE SURGICAL TREATMENT OF ACUTE PURULENT CHOLANGITIS USING HYBRID MINIMALLY INVASIVE TECHNOLOGIES.....	293
42.	Nurillayev Khasan Zhamshidovich ACUTE CHOLECYSTITIS IN THE ELDERLY: FEATURES OF THE CLINICAL COURSE, DIAGNOSIS AND TREATMENT.....	300
43.	Obidov Shokhrukh Khabibovich, Mamarajabov Sobirjon Ergashevich MODERN APPROACHES TO SURGICAL TREATMENT OF INGUINAL HERNIAS IN OBESE PATIENTS.....	306
44.	Rabbimova Maftuna Ulugbekovna. ENDOSCOPIC ULTRASOUND ELASTOGRAPHY: CURRENT STATE AND DEVELOPMENTAL DIRECTIONS.....	313
45.	Rakhmatov Istodjon Samedjonovich THE ROLE AND IMPORTANCE OF X-RAY EXAMINATIONS IN MEDICINE.....	337
46.	Ruziboyev Sanjar Abdusalomovich, Allaberdiyev Nemat Abdushukurovich, Shavazi Ramiz Nuralievich REMOTE RESULTS OF THE IMPROVED LIXTENSHTEIN MODIFICATION.....	343
47.	Ruziboev Sanjar Abdusalomovich, Mardonov Vohid Narzullayevich, Shavazi Ramiz Nuralievich EXPERIMENT OF APPLYING ANTI-ADHESIVE PREPARATIONS IN THE EXPERIMENT.....	352

48.	Rizayev Jasur Alimjanovich, Abdullayev Sayfulla Abdullayevich THE SIGNIFICANCE OF NUTRITIONAL SUPPORT IN THE SURGICAL TREATMENT OF PURULENT-NECROTIC INFLAMMATION OF SOFT TISSUES.....	360
49.	Rizayev Ezoz Alimdjanovich, Kurbaniyazov Zafarjon Babajanovich PREDICTION OF ACUTE PANCREATITIS OUTCOMES BASED ON LAPAROSCOPY DATA AND THE BALTHAZAR SCALE.....	365
50.	Ravshanov Mukhammadali Ikhtiyorovich, Askarov Pulat Azadovich MINIMALLY INVASIVE METHODS OF SURGICAL TREATMENT OF OBSTRUCTIVE JAUNDICE OF BENIGN ORIGIN.....	373
51.	Rashidova Xurshida Abduvoxiidovna POSSIBILITIES OF CLINICAL AND LABORATORY AND INSTRUMENTAL STUDIES IN NON – ALCOHOLIC FATTY LIVER DISEASE.....	379
52.	Salimov Eshdavlat Eshmakhmatovich, Rakhmanov Kosim Erdanovich IMPROVEMENT OF SURGICAL TREATMENT OF PATIENTS WITH THYROID NODULES.....	386
53.	Sayinaev Farrukh Karamatovich, Rakhmanov Kosim Erdanovich ASPECTS OF LAPAROSCOPIC HERNIOPLASTY FOR VENTRAL HERNIAS.....	392
54.	Salokhiddinov Jurabek Saidakhmatovich TOPICAL ISSUES OF SURGICAL TREATMENT OF TOXIC FORMS OF GOITER...	397
55.	Suvonov Shokhruxh Shukhrat ugli CURRENT METHODS OF TREATMENT OF LARGE AND GIANT VENTRAL HERNIAS USING TENSION-FREE HERNIOPLASTY.....	403
56.	Shirov Bobur Furkatovich, Mardieva Gulshod Mamatmuradova EVALUATION OF THE DIAGNOSTIC EFFECTIVENESS OF THE BONE COVERAGE COEFFICIENT AND SIDE RATIO COEFFICIENT COMPARED TO THE GRAF METHOD.....	409
57.	Shomurodov Khabibullo Abdumalik ugli, Daminov Feruz Asadullaevich, Rakhmanov Kosim Erdanovich APPLICATION OF LAPAROSCOPY IN SURGICAL TREATMENT OF ACUTE DESTRUCTIVE CHOLECYSTITIS.....	419
58.	Turakulov Vali Norkulovich. MEASURES TO IMPROVE THE QUALITY OF LIFE OF PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD).....	424
59.	Tagaev Abror Ilkhomovich, Rakhmanov Kosim Erdanovich OPTIMIZATION OF SURGICAL TREATMENT OF PATIENTS WITH PURULENT PLEURISIS.....	430
60.	Toirov Abdukhomit Suvonovich, Musoev Sodiqjon Toirovich THE ROLE OF ENDOVENOUS LASER COAGULATION IN THE COMPLEX TREATMENT OF VARICOSE VEINS OF THE LOWER EXTREMITIES.....	437
61.	Turdumatov Jamshed Anvarovich, Sobirova Nilufar RADIOLOGICAL SEMIOTICS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN TYPE II DIABETES MELLITUS.....	442
62.	Tukhtayev Firdavs Mukhidinovich, Ergashev Arslonbek Shukhratjon ugli LAPAROSCOPIC TREATMENT OF CYSTIC KIDNEY NEOPLASMS: EFFICACY AND RESULTS.....	451
63.	Umedov Xushvaqt Alisherovich, THE ROLE AND IMPORTANCE OF VIDEOLAPAROSCOPY IN CLOSED ABDOMINAL INJURIES.....	457
64.	Umedov Xushvaqt Alisherovich IMPROVEMENTS IN DIAGNOSTIC AND THERAPEUTIC CAPABILITIES OF VIDEOLAPAROSCOPY WITH CLOSED ABDOMINAL LESIONS.....	463

65. **Usarov Sherali Nasretidinovich**
ANALYSIS OF THE RESULTS OF SURGICAL TREATMENT OF PATIENTS WITH INGUINAL HERNIAS.....474
66. **Yanova Elvira Umarjonovna, Urokov Farrukh Ibodullaevich**
TYPES OF ANGIODYSPLASIA IN KIMMERLE ANOMALY BY MAGNETIC RESONANCE ANGIOGRAPHY.....479
67. **Yuldashev Parida Arzikulovich, Rakhmanov Kosim Erdanovich, Davlatov Salim Sulaymonovich**
OPTIMIZATION OF SURGICAL APPROACHES IN THE TREATMENT OF POSTOPERATIVE VENTRAL HERNIAS.....491
68. **Alisher Zayniyev Faridunovich**
A NEW PLASMAPHERESIS METHOD FOR PREOPERATIVE PREPARATION IN PATIENTS WITH THYROTOXICOSIS.....499
69. **Ablyazov Otabek Vakhobovich, Yakubov Golib Akbarovich, Ablyazov Abduvakhob Abdumadzhidovich, Madumarova Zarnigor Shukhratovna, Turgunov Shomakhmud Shorakhimovich**
IMAGING METHODS FOR CERVICAL SPINAL CANAL STENOSIS.....508
70. **Kurbaniyazov Bakhodir Zafarzhonovich, Ashurov Akmal Khusanovich**
TACTICAL AND TECHNICAL ASPECTS OF TRANSABDOMINAL LAPAROSCOPIC HERNIALLOPLASTY FOR INGUINAL HERNIAS.....512
71. **Kilichev Rashid Nematovich, Mamarajabov Sobirjon Ergashevich, Babakalanov Shuhrat Ibragimovich, Oltiyev Elyor Doniyorovich.**
EVALUATION OF THE EFFECTIVENESS OF HAL-RAR AND LHP SURGICAL APPROACHES IN THE TREATMENT OF HEMORRHOIDS.....520
72. **Ahmedov Gayrat Keldibayevich, Gulamov Olimjon Mirzakhitovich, Azizov Temur Alisher ugli, Toshkenboyev Firdavs Ramatillo Zoda, Khudaynazarov Utkir Rabbimovich.**
ANASTOMOSIS IN ESOPHAGULAR CANCER OPERATIONS.....526
73. **Teshayev Shuxrat Jumayevich, Jarilkasinova Gauzar Januzakovna.**
SOCIAL AND CLINICAL-BIOCHEMICAL FACTORS IN THE PATHOGENESIS OF GASTRITIS AND ULCER DISEASE: STUDYING SMOKING AND PROFESSIONAL DEPENDENCE.....531
74. **Khaibullina Zarina Ruslanovna, Babajanov Azam Khasanovich, Djuraeva Nigora Mukhsumovna, Abdukhalimova Khanum Valentinovna**
VON WILLEBRAND FACTOR DYNAMICS AFTER RELATED LIVER TRANSPLANTATION.....538
75. **Khaydarova Nargiza Akhtamzhon kizi**
ANALYSIS OF MORPHOFUNCTIONAL AND MORPHOMETRIC FEATURES OF THE THYROID GLAND IN 5-MONTH-OLD MONGREL RATS IN THE OBSERVATION GROUP.....549
76. **Mardiyeva Gulshod Mamatmuradovna, Abdullaeva Mukhiba Nigmatovna, Matyakupov Azim Rustemovich, Nurmamatova Ozoda Abdurasul kizi.**
ROENTGEN-PROTEINOLOGICAL RELATIONSHIPS IN THE DYNAMICS OF PNEUMONIA IN NEWBORNS, TAKING INTO ACCOUNT THE DEGREE OF THEIR MATURITY.....556
77. **Karabyev Djamshidkhan Shavkatovich, Shakhanov Shavkat Safarovich, Shakirov Bobur**
PREVENTION AND EFFECTIVENESS OF ARTHRITIS IN PATIENTS WITH BURNS USING LOW VIBRATION LASER BEAMS.....564
78. **Исмаилов Зоҳиджан, Мирджуроев Элбек**
ЗАБОЛЕВАНИЯ ПЕРИФЕРИЧЕСКОЙ НЕРВНОЙ СИСТЕМЫ, ИХ ДИАГНОСТИКА, ВЫБОР ПРАВИЛЬНОЙ ТАКТИКИ ЛЕЧЕНИЯ И ШИРОКОЕ ВНЕДРЕНИЕ РЕАБИЛИТАЦИОННОЙ РАБОТЫ ПОСЛЕ ПЕРЕНЕСЕННЫХ ЗАБОЛЕВАНИЙ...570
79. **Ismailov Zakhidjon, Mirdjuraev Elbek**
EXAMINATION OF CHILDREN WITH NEUROPATHY, TIMELY DIAGNOSIS, TREATMENT AND REHABILITATION MEASURES AFTER ILLNESSES.....578

БИОМЕДИЦИНА ВА АМАЛИЁТ ЖУРНАЛИ

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A NEW PLASMAPHERESIS METHOD FOR PREOPERATIVE PREPARATION IN PATIENTS WITH THYROTOXICOSIS

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ABSTRACT

The study analyzed the treatment outcomes of 112 patients diagnosed with toxic forms of goiter. Among them, 24 patients (21.4%) exhibited treatment inefficacy, intolerance to antithyroid drugs, or complications arising from prolonged thyrostatic therapy. For these patients, a discrete plasmapheresis method was implemented, incorporating indirect electrochemical plasma oxygenation using sodium hypochlorite, followed by additional ozonation and the reinfusion of detoxified autologous plasma. This approach significantly shortened the preoperative preparation period, reducing it from 12 months in the comparison group to just 2 months in the main treatment group.

Keywords: thyrotoxicosis, antithyroid therapy, plasmapheresis.

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НОВЫЙ СПОСОБ ПЛАЗМАФЕРЕЗА У БОЛЬНЫХ С ТИРЕОТОКСИКОЗОМ ДЛЯ ПРЕДОПЕРАЦИОННОЙ ПОДГОТОВКИ

АННОТАЦИЯ

В основу исследования включены результаты лечения 112 больных токсическими формами зоба. Из 112 пациентов у 24 (21,4%) выявлены либо неэффективность, либо непереносимость, либо осложнения, возникшие у них в результате длительного анти тиреоидного лечения тиреостатиками. У этих больных применяли дискретный метод плазмафереза в сочетании с непрямой электрохимической оксигенации плазмы гипохлоритом натрия с дополнительным озонированием и последующей реинфузией детоксицированной аутоплазмы. В итоге было достигнуто сокращение периода подготовки больных к операции с 12 месяцев в группе сравнения до 2 месяца в основной группе.

Ключевые слова: тиреотоксикоз, анти тиреоидная терапия, плазмаферез.

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**TIREOTOKSIKOZ BILAN BEMORLARDA OPERATSIYADAN OLDINGI
TAYYORLASHDA PLAZMAFEREZNING YANGI USULI****ANNOTATSIYA**

Tadqiqotga 112 nafar toksik bo'qoq bilan bemorlarning davolash natijalari asos qilib olingan. 112 nafar bemordan 24 (21,4%) nafarida tireostatiklar yordamida o'tkazilgan antitireoid davoga nisbatan samarasizlik, yoki uning uzoq muddatdavomida qo'llanilishi hisobiga asoratlar, yoki dorilarning ko'tara olmaslik holati kuzatildi. Ushbu bemorlarga plazmaferезning diskret usuli, olingan plazmaning gipoxlorit natriy bilan elektrokimyoviy oksigenatsiyasi va qo'shimcha ozonlashtirish, hamda zarasizlantirilgan autoplazmaning reinfuziyasi qo'llanildi. Natijada operatsiyaga tayyorlash bosqichi taqqoslash guruhidagi 12 oyga nisbatan 2 oygacha qisqarishiga erishildi.

Tayanch so'zlar: tireotoksikoz, antitireoid davo, plazmaferез.

Relevance. The management of toxic goiter continues to pose a considerable challenge in endocrine surgery. **Thyroidectomy**, the most commonly utilized surgical intervention, is performed in **90.6% of cases**, employing various techniques for thyroid nodule excision [1,5,8]. However, the **high incidence of postoperative complications**, including **recurrent thyrotoxicosis (15-44%)** and **postoperative hypothyroidism (25-63%)**, underscores the limitations and suboptimal reliability of conventional surgical approaches [2,3,7]. These challenges necessitate **the refinement of current treatment protocols and the development of more advanced preventive and therapeutic strategies** to enhance patient outcomes [4,6].

Study Objective: To assess the efficacy of discrete plasmapheresis in the preoperative preparation of patients with severe thyrotoxicosis.

Research Materials and Methods: This study is based on the clinical outcomes of 112 patients diagnosed with toxic goiter who were admitted to the surgical department of the multidisciplinary clinic at Samarkand State Medical University between 2012 and 2024.

Among the 112 patients included in the study, 102 individuals (91.1%) were diagnosed with toxic goiter for the first time, while 10 patients (8.9%) had recurrent toxic goiter. Of these, 8 cases were classified as primary relapse. Out of the 10 patients with recurrent toxic goiter: 6 patients had previously undergone their initial thyroid surgery at our clinic at various time points. 4 patients had a history of thyroidectomy performed at other medical institutions. The recurrence of goiter following surgery was observed within 5 years in 7 patients and within 10 years in 3 patients. Notably, in 3 cases, the initial diagnosis was primary nodular nontoxic goiter, which transformed into a toxic form within a 3-year period. The remaining 7 patients had previously undergone surgical treatment for diffuse toxic goiter. The degree of thyroid gland enlargement was classified according to O.V. Nikolaev's classification, based on ultrasound examination and palpation findings. 43 patients (38.4%) presented with Grade II-III toxic goiter. 69 patients (61.6%) had Grade IV-V goiter. The severity of thyrotoxicosis was evaluated in accordance with V.G. Baranov's classification: Mild form – 35 patients (31.2%), Moderate form – 52 patients (46.4%), Severe form – 25 patients (22.3%). Pathomorphological classification of goiter based on histopathological analysis, the distribution of goiter types was as follows: 50 patients (44.6%) – Diffuse toxic goiter, 39 patients (34.8%) – Mixed toxic goiter, 13 patients (11.6%) – Toxic adenoma, 10 patients (8.9%) – Recurrent toxic goiter. Prior to surgery, all patients underwent prolonged clinical observation and received conservative antithyroid therapy. The duration of conservative management varied: 7 patients (6.2%) received treatment for up to 1 year. 29 patients (25.9%) underwent 1 to 3 years of conservative therapy. 76 patients (67.8%) were treated for more than 3 years before surgical intervention. These findings underscore the chronic nature of toxic goiter progression and the limitations of long-term conservative

therapy, necessitating a well-structured preoperative management strategy to optimize surgical outcomes.

Results: Among the 112 patients, 24 (21.4%) exhibited treatment inefficacy, intolerance to antithyroid medications, or complications resulting from prolonged use of thyrostatics. An analysis of pre-hospital pharmacological treatment outcomes revealed that conservative therapy was ineffective in eight cases, five patients experienced drug intolerance, and three developed complications such as leukopenia and gastrointestinal disorders.

A thorough review of patient history demonstrated that pre-hospital conservative therapy primarily involved antithyroid agents such as methimazole, thiamazole, prednisone, and dexamethasone. The frequency of complications was analyzed based on the duration of drug administration and dosage aimed at achieving stable remission.

The findings suggest that most complications occurred in patients subjected to prolonged antithyroid therapy despite the absence of substantial clinical improvement. In the comparison group, 10 patients underwent surgery despite the inefficacy of pharmacological preparation. Due to inadequate preoperative management, intraoperative excessive bleeding was reported in 3 patients (5.8% of the comparison group), while 4 patients (7.7%) developed moderate to severe thyrotoxic crisis in the early postoperative period.

These observations prompted the exploration of improved preoperative management strategies for patients with toxic goiter. Unlike the control group, patients with severe thyrotoxicosis or contraindications to antithyroid therapy were treated using a discrete plasmapheresis method combined with indirect electrochemical oxygenation (IECO) of plasma with sodium hypochlorite, additional ozonation, and reinfusion of detoxified autologous plasma.

Sodium hypochlorite, as a potent oxidizing agent, initiates hydroxylation reactions of organic substances that accumulate in severe thyrotoxicosis. When applied to plasma, sodium hypochlorite releases "active" oxygen, which oxidizes triiodothyronine and thyroxine. However, oxidation by-products, such as hydroperoxides, decompose into free radicals that can have detrimental effects on blood components and overall physiological function.

To mitigate these effects, additional ozonation of exfused plasma following sodium hypochlorite treatment was employed. This method enhances the detoxifying effect, reduces the toxicity of plasma and erythrocytes, and prevents adverse effects associated with sodium hypochlorite. The interaction between ozone and organic substrates activates oxygen-dependent metabolic processes and modifies the physicochemical properties of biological membranes. This process contributes to increased pO_2 levels, stimulation of redox reactions, and intracellular metabolic shifts, leading to enhanced synthesis and transformation of biologically active substances (e.g., catecholamines, serotonin, histamine). Additionally, it strengthens the activity of immune-competent peripheral blood cells and promotes endogenous detoxification mechanisms by facilitating the elimination of under-oxidized metabolic products.

The detoxification approach utilized in this study involved therapeutic plasmapheresis with an extracted plasma volume of 600-800 mL. Exfused plasma was collected under aseptic conditions in sterile blood storage containers of pre-determined volumes.

In accordance with strict aseptic protocols, 0.12% (1200 mg/L) sodium hypochlorite solution (produced via electrochemical oxidation of isotonic sodium chloride solution using the EDO-4 system) was added to the plasma at a 10:1 ratio (e.g., 40 mL of NaClO per 400 mL of plasma). The solution was gently mixed for 2-3 minutes, and an ozone-oxygen gas mixture was bubbled through the plasma using the "Asia-R" clinical ozonator for 10 minutes. The plasma was then stored in a refrigerator at 6-8°C.

Laboratory analysis demonstrated that oxidation of toxic plasma components, including thyroid hormones, was generally completed within 3-4 hours of incubation. After 4 hours, the precipitate (50-70 mL) was removed using a plasma extractor or an aspiration method.

A 10-mL plasma sample was taken for biochemical analysis to confirm adequate detoxification. When the albumin concentration increased by more than 1.9 times, the detoxified autologous plasma was deemed suitable for reinfusion as a plasma-substituting medium during

subsequent programmed plasmapheresis sessions. The criteria for determining plasma detoxification suitability were based on the methodology of N.M. Fedorovsky (2004).

Upon clinical improvement and normalization of peripheral blood parameters, patients underwent surgical intervention.

Clinical Case Example 1. Patient X, female, 50 years old (Medical Record No. 6395/584), was diagnosed with: Diffuse toxic goiter (Grade IV). Severe thyrotoxicosis. Thyrotoxic ophthalmopathy (Grade IV). Leukopenia. Hypochromic anemia. Lymphadenopathy. Myocardial dystrophy (Stage IIa). Hypertension (Stage IIa).

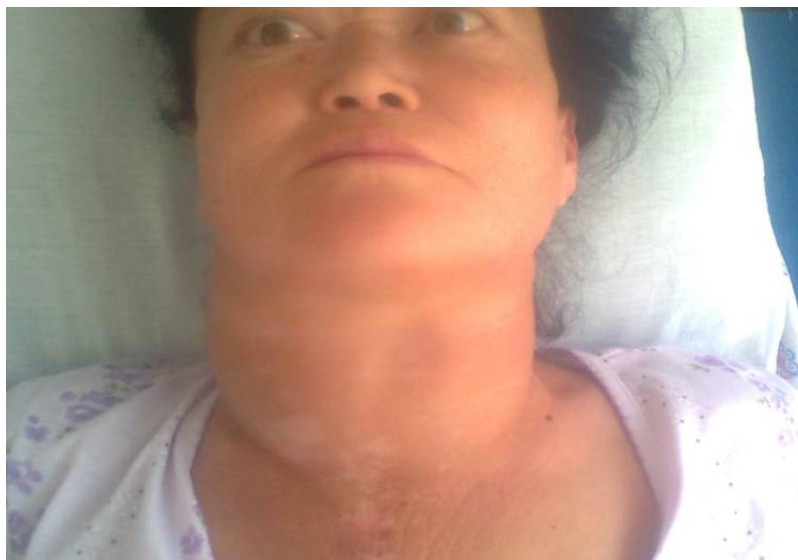


Figure 1. Patient X, female, 50 years old (Medical Record No. 6395/584), diagnosed with: Grade IV diffuse toxic goiter, severe thyrotoxicosis, grade IV thyrotoxic ophthalmopathy.

The patient presented with symptoms of generalized weakness, palpitations, excessive sweating, hand tremors, and significant weight loss. Her medical history indicated a disease onset in 2008, when she began experiencing palpitations, shortness of breath, and exophthalmos. She was initially diagnosed by an endocrinologist in December 2008 and prescribed methimazole at 30 mg/day for 1.5 years, but remission was not achieved. In 2011, laboratory findings revealed leukopenia (WBC count: $2.1 \times 10^9/L$) and hypochromic anemia (RBC count: $2.1 \times 10^{12}/L$, hemoglobin: 84 g/L). Additionally, the patient developed urticaria, leading to the discontinuation of methimazole and initiation of prednisone at 60 mg/day for two-week courses. Although the treatment provided temporary relief, urticaria reappeared, necessitating discontinuation of corticosteroids. By 2012, thyrotoxicosis had worsened, with a documented weight loss of 15 kg over eight months, increased tremors, tachycardia, and worsening exophthalmos. Concurrently, the patient developed a gastric ulcer. Surgical intervention was only considered in 2013, leading to hospitalization. Upon admission, the patient was in critical condition, with below-normal body weight, pale and moist skin, and a heart rate of 130 bpm. Blood pressure was elevated at 180/100 mmHg. Electrocardiography (ECG) showed ventricular extrasystoles with no significant ST-segment changes. Laboratory hormone levels: T4: 250 nmol/L (normal range: 60-160 nmol/L). T3: 5.6 nmol/L (normal range: 1.2-2.8 nmol/L). TSH: 0.1 mIU/L (normal range: 0.17-4.05 mIU/L). The patient underwent five plasmapheresis sessions, which successfully reduced thyroid hormone levels: T4: 154 nmol/L, T3: 2.5 nmol/L, TSH: 0.12 mIU/L. On April 17, 2013, the patient underwent subtotal subfascial thyroidectomy without intraoperative or postoperative complications. She was discharged on postoperative day seven, and a two-year follow-up revealed no recurrence of the disease.

This case clearly illustrates that long-term conservative treatment was ineffective, regardless of whether thyrostatics or hormonal agents were used. Moreover, the patient developed intolerance to these medications, followed by hematological and gastrointestinal complications.

According to numerous clinical guidelines, 5 to 7 sessions of plasmapheresis are generally sufficient for preoperative preparation in patients with toxic forms of goiter. This recommended range of sessions was also used as a reference in our treatment approach.

The effectiveness of plasmapheresis was assessed by monitoring the dynamics of thyroid hormone levels (T4, T3, and TSH). Figures 2–4 illustrate the concentration changes of these hormones in 14 patients before and after undergoing discrete plasmapheresis.

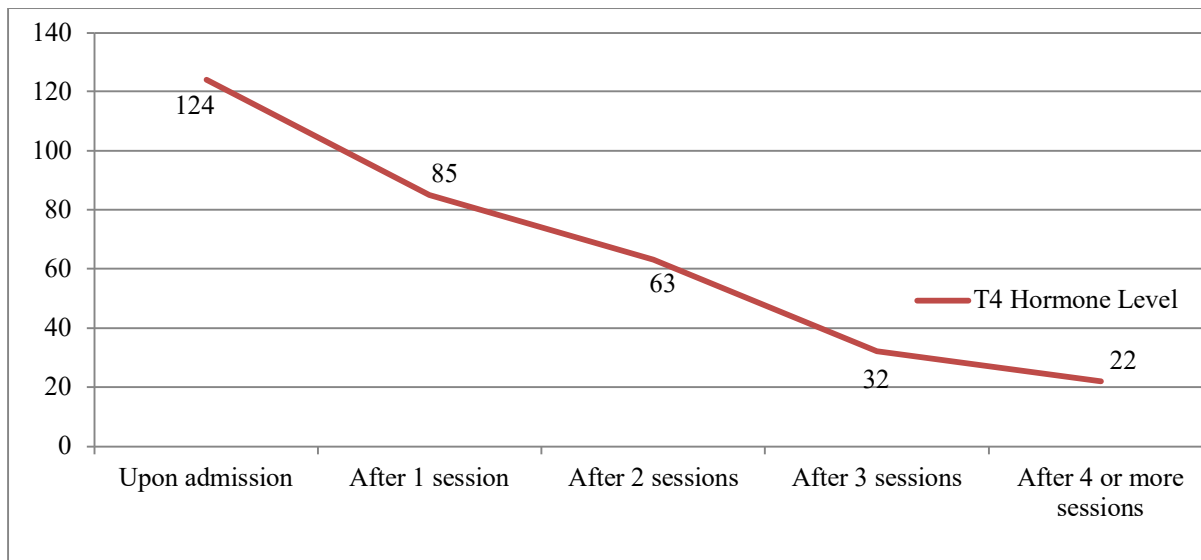


Figure 2. T4 levels in patients with toxic goiter before and after plasmapheresis.

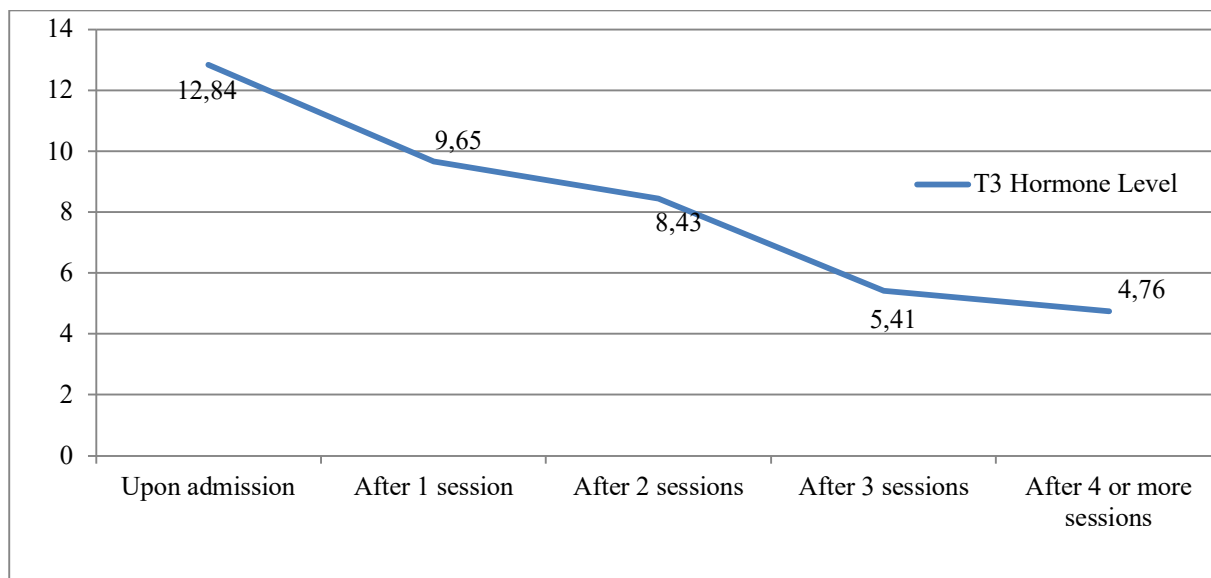


Figure 3. T3 levels in patients with toxic goiter before and after plasmapheresis.

The analysis revealed that, prior to treatment, T4 and T3 levels in all patients with toxic goiter were elevated 3.5 to 4 times above the normal range. At the same time, TSH levels were either below normal or at its lower limit. No direct correlation was observed between TSH concentration and the severity of thyrotoxicosis. Following treatment, T4 and T3 levels approached normal values or their upper limits, while TSH levels remained unchanged or showed a slight increase.

The efficacy of preoperative management was assessed by comparing blood pressure (BP) and heart rate (HR) before, during, and after surgery in two groups: 14 patients who underwent plasmapheresis, 10 patients who received only pharmacological preparation.

An increase in BP and HR beyond each patient’s individual baseline was interpreted as an episode of hypertension and tachycardia, attributed to thyrotoxicosis progression.

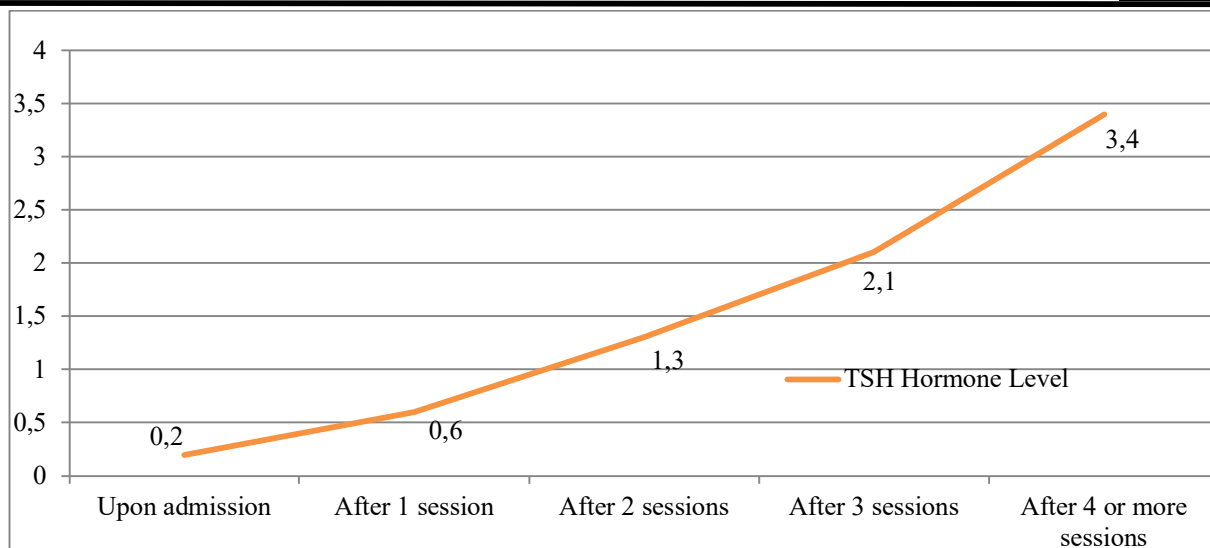


Figure 4. TSH levels in patients with toxic goiter before and after plasmapheresis.

Upon admission, all patients with ineffective conservative therapy exhibited hypertension and tachycardia: In the comparison group, hypertension was observed in 3 patients, while severe tachycardia was noted in 4 patients. Following plasmapheresis combined with indirect electrochemical plasma oxygenation (IECO) using sodium hypochlorite, additional ozonation, and reinfusion of detoxified plasma, hypertension and tachycardia persisted in only 2 patients in the plasmapheresis group, with heart rate stabilizing at 90 bpm.

These findings confirm that plasmapheresis significantly improves hemodynamic stability in patients with severe thyrotoxicosis, enhancing their preoperative condition and reducing surgical risks.

The effectiveness of preoperative preparation using plasmapheresis (PF) versus pharmacological therapy was evaluated based on absolute intraoperative data, as presented in Table 1. Using these findings, we calculated the key indicators of preoperative preparation effectiveness in patients undergoing plasmapheresis, compared to those who received only medication-based preparation. The data in the table demonstrate a significantly lower incidence of adverse outcomes during thyroidectomy in patients who underwent plasmapheresis-assisted preparation, compared to those who received standard pharmacological preoperative management.

Table 1.

Effectiveness of Preoperative Preparation (Pre-Surgery Assessment).

Comparison Groups	Outcome (Tachycardia & Hypertension)		
	No Effect	Effective	Total
Main Group (Plasmapheresis)	2	12	14
Control Group (Thyrostatics)	6	4	10
Total	8	16	24

Furthermore, in the postoperative period, the proportions of patients and outcome indicators remained consistent, confirming the sustained benefits of plasmapheresis in preoperative stabilization and surgical success rates.

Clinical Case Example 2. Patient L., male, 50 years old (Medical Record No. 6397/585), was hospitalized from June 8, 2017, to June 28, 2017, with the following diagnosis: Grade III diffuse toxic goiter, Severe thyrotoxicosis, Grade II exophthalmos, Thyrotoxic heart disease, Paroxysmal

tachycardia, Ischemic heart disease (IHD), Effort angina (Functional Class I), Atherosclerotic cardiosclerosis, Gastric ulcer (Figure 5).



Figure 5. Patient L., male, 50 years old, diagnosed with: Grade III diffuse toxic goiter, Severe thyrotoxicosis, Grade II exophthalmos, Thyrotoxic heart disease, Paroxysmal tachycardia

Upon admission, the patient reported the following symptoms: Enlargement of the neck, Weight loss of 15 kg over one year, Foreign body sensation in the eyes, Frequent bowel movements (4-5 times per day). The patient's medical history revealed that symptoms began in 1995 with chest pain and palpitations. He was under the supervision of an endocrinologist and received multiple courses of treatment, including: Methimazole (Mercazolil) 40 mg/day, Prednisolone up to 30 mg/day, Iodine preparations, Nitrates, Verapamil, Aspirin, Piracetam, Sedatives. During the first three years of treatment, the patient experienced temporary improvement, but thyrotoxicosis relapsed. Over time, the dosage of methimazole and prednisolone had to be increased. From 1998, the patient developed upper abdominal pain after meals. Esophagogastroduodenoscopy (EGD) revealed a gastric ulcer. Thyroid gland: Enlarged, elastic, firm, painless on palpation. Positive signs: Möbius, Murphy, Graefe. Ultrasound findings: Isthmus thickness: 9.1 mm, Right lobe volume: 2.2 cm³. Left lobe volume: 28.7 cm³. Heterogeneous echostructure, no additional formations. The patient was scheduled for surgery due to progression of the disease. Preparation protocol: Four sessions of plasmapheresis (PF) combined with indirect electrochemical plasma oxygenation (IECO) using sodium hypochlorite, additional ozonation, and reinfusion of detoxified autologous plasma. Thyroid hormone levels before plasmapheresis: T4: 290 nmol/L (normal range: 60–160 nmol/L), T3: 5.1 nmol/L (normal range: 1.2–2.8 nmol/L), TSH: 0.17 mIU/L (normal range: 0.17–4.05 mIU/L), Thyroid hormone levels after six plasmapheresis sessions: T4: 170 nmol/L, T3: 2.4 nmol/L, TSH: 0.19 mIU/L. On June 20, 2017, the patient underwent subtotal subfascial thyroidectomy. The postoperative period was uneventful, and the patient was discharged in stable condition on June 28, 2017.

The presented case of Patient V. demonstrates that, despite the severity of thyrotoxicosis and its complications (including thyrotoxic heart disease), preoperative therapy incorporating plasmapheresis sessions enabled successful patient stabilization and surgical intervention without adverse consequences.

For patients who underwent preoperative preparation without plasmapheresis, surgery was performed following standard protocols. However, in cases of severe thyrotoxicosis, where medical euthyroidism was not achieved within three months or patients exhibited intolerance to antithyroid drugs, the following regimen was implemented: β -blockers and 1% Lugol's solution for two weeks prior to surgery. Six sessions of plasmapheresis (PF) combined with indirect electrochemical plasma

oxygenation (IECO) using sodium hypochlorite, additional ozonation, and reinfusion of detoxified autologous plasma. This integrated approach facilitated optimal preoperative stabilization, allowing safe and effective surgical treatment for patients with severe, drug-resistant thyrotoxicosis.

The developed plasmapheresis protocol for patients with toxic forms of goiter enabled the selection of an optimal preoperative preparation strategy. As a result, the preparation period for surgery was significantly reduced from 12 months in the comparison group to just 2 months in the main group (Figure 6).

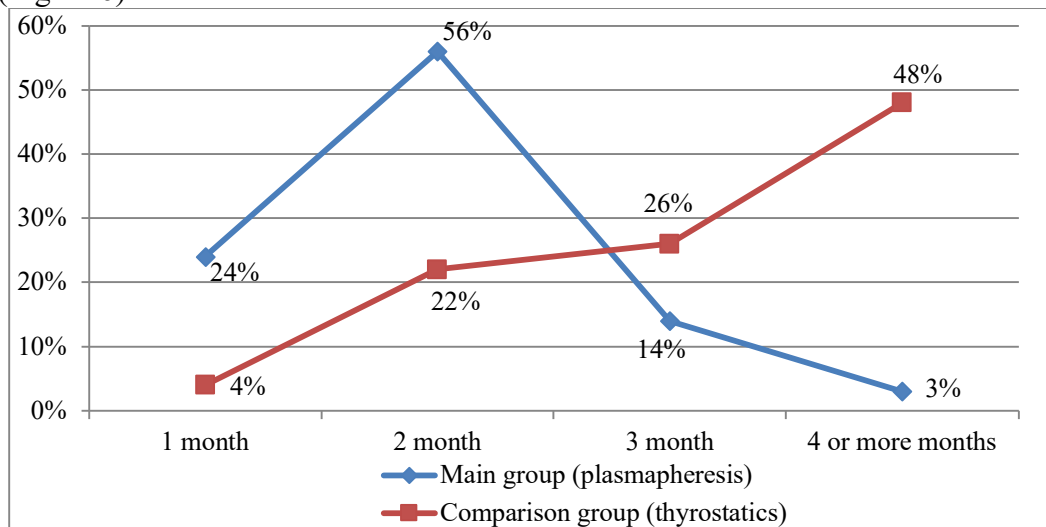


Figure 6. Duration of Preoperative Preparation in the Studied Groups.

Additionally, this approach effectively eliminated the adverse effects associated with antithyroid drugs, such as: Leukopenia, Agranulocytosis, Gastrointestinal complications.

These findings highlight the clinical advantages of plasmapheresis in optimizing preoperative management and minimizing the risks of pharmacological therapy in patients with severe thyrotoxicosis.

Conclusions.

The combination of plasmapheresis with indirect electrochemical plasma oxygenation (IECO) using sodium hypochlorite, additional ozonation, and reinfusion of detoxified autologous plasma in patients with severe thyrotoxicosis and drug intolerance has been shown to: Significantly reduce thyroid hormone levels, achieving more stable endocrine balance, Normalize cardiovascular function, improving hemodynamic stability, Effectively prevent thyrotoxic crisis in the early postoperative period. This integrated approach enhances preoperative management, minimizes surgical risks, and contributes to better postoperative recovery in patients with severe, treatment-resistant thyrotoxicosis.

REFERENCES | ЧОККИ | IQTIBOSLAR:

1. Bartalena, L. Management of hyperthyroidism due to Graves' disease: frequently asked questions and answers (if any) / L. Bartalena, L. Chiovato, P. Vitti // Journal of Endocrinological Investigation. - 2016. - Vol. 39. - P. 1105-1114.
2. Shin YW. et al. Diminished Quality of Life and Increased Brain Functional Connectivity. Patients with Hypothyroidism After Total Thyroidectomy // Thyroid. -2020. - Vol. 26, № 5. - P. 641-649.
3. Schneider D.F. et al. Thyroidectomy as primary treatment optimizes body mass index in patients with hyperthyroidism // Ann Surg Oncol. - 2021. - Vol. 21, № 7. - P. 2303-2309.
4. Belokonev, V.I. The influence of surgery technique on the immediate results of treatment of patients with toxic forms of goiter / V.I. Belokonev, A.A. Starostina // Surgeon. - 2018. - No. 1. - pp. 42-47 .(in Russ).
5. Ismailov, S.I. The quality of life of patients on the background of therapy with thyroxine and a combination of thyroxine and triiodothyronine after total thyroidectomy due to Graves' disease

- / S.I. Ismailov, A.M. Akbutaev, A.A. Elov // International Endocrinological Journal. - 2017. - Vol. 61, No. 5. -pp. 52-55 .(in Russ).
6. Kurbaniyazov Z.B., Babadzhanov A.S., Zainiev A.F., Davlatov S.S. Factor analysis of recurrence of nodular goiter in residents living in an iodine-deficient region. // Problems of biology and medicine. – Samarkand. - 2019, - №3 (111). Pp. 58-62 .(in Russ).
7. Kurbaniyazov Z.B., Davlatov S.S., Babadzhanov A.S. Diseases of the thyroid gland. // Methodological recommendations. Tashkent – 2014. Page 31 .(in Russ).

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