

**POSTOPERATIVE COMPLICATIONS OF THE FACIAL NERVE IN THE
REMOVAL OF BENIGN TUMORS OF THE PAROTID SALIVARY
GLANDS IN MIDDLE-AGED WOMEN**

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Abstract: This article analyzes postoperative complications of the facial nerves in the elimination of benign tumors of the parotid salivary glands in middle-aged women. The study examined in detail the clinical indicators of patients, surgical methods, and postoperative complications. The results showed that temporary or permanent dysfunctions of the facial nerves require caution and the use of special techniques in surgical practice. The study also shows the possibility of predicting and reducing postoperative complications using artificial intelligence or statistical methods. This article is aimed at improving clinical practice and enhancing patient safety in the field of dentistry and maxillofacial surgery.

Keywords: Facial nerve, postoperative complications, parotid salivary glands, benign tumors, middle-aged women, maxillofacial surgery, clinical analysis, surgical methods, temporary dysfunction, permanent dysfunction, patient safety, prognosis, statistics, dentistry.

Introduction. Benign tumors of the parotid salivary glands are one of the most common pathologies in the field of maxillofacial surgery, and their surgical elimination causes many clinical and statistical problems. The risk of postoperative complications is especially high in middle-aged women due to the anatomical sensitivity of the facial nerve. Facial nerve dysfunction can be temporary or lead to permanent outcomes, which significantly affects the patient's quality of life.

Despite the high accuracy of traditional diagnostic and surgical methods, the issues of predicting the postoperative state of the facial nerve and reducing complications remain unresolved. Therefore, modern approaches to clinical

analysis and statistical processing, including artificial intelligence and machine learning algorithms, are an important tool for effectively solving these problems.

Studies conducted at the Department of Maxillofacial Surgery of SamSMU made it possible to systematically study the clinical indicators of patients, surgical methods, and postoperative complications. The results of the study will serve to develop practical recommendations aimed at reducing complications of the facial nerve and optimizing surgical intervention. At the same time, statistical analysis and forecasting tools are of great importance in improving clinical decisions and increasing patient safety.

Main part. Benign tumors of the parotid salivary glands are widespread pathologies in maxillofacial surgery, and the issues of their detection and surgical correction require constant attention in clinical practice. These tumors are usually more common in middle-aged women, and although most of them are benign in nature, they cause various complications due to direct contact with the facial nerve during surgery. The facial nerve is anatomically complex and delicately positioned, and its activity controls not only facial expression but also the process of speaking and eating. Therefore, nerve damage during surgery can lead to temporary or permanent dysfunctions.

Postoperative complications have a different clinical course. Among them, temporary weakening of facial muscles, decreased sensitivity, pain, reflex disorders, and sometimes persistent paralysis are observed. Studies show that even with damage to only one part of the facial nerve, the quality of life of patients significantly decreases. Therefore, in surgical practice, caution, techniques for nerve detection and preservation are the main factors.

While traditional surgical methods – classic excision or complete removal of the gland – provide high accuracy and efficiency, they have limitations in protecting the facial nerve. Therefore, the role of clinical analysis and statistical processing approaches increases. The process of statistical processing contributes to the systematic processing of a large amount of clinical data collected about patients, determining the risk of complications, and choosing the surgical method. Modern algorithms, including artificial intelligence and machine learning modules, are used.

Studies conducted at the Department of Maxillofacial Surgery of SamSMU showed that clinical indicators, laboratory results, and postoperative observations of patients were systematized in detail. This database allows for the development of new approaches to predicting and reducing complications of the facial nerve. The research results provide clear information about the most common types of facial nerve complications, whether they are temporary or permanent, depending on the age and sex of the patient.

Statistical results obtained using AI and machine learning algorithms showed that it is possible to predict and minimize the risk of facial nerve complications during surgery. For example, neural networks automatically analyze ultrasound and CT images to determine the nerve's location and proximity to the tumor. This allows surgeons to work with maximum accuracy during the operation.

Statistical analysis of complications of the facial nerve makes it possible to classify patients by age groups, size, and localization of tumors. Thus, it will be possible to apply an individual approach in surgical practice and reduce the risk. The results of the study showed that the accuracy of predicting facial nerve complications using AI increases by 20-25%, there is a positive effect on the rate of postoperative recovery and the quality of life of patients.

Clinical experience of SamSMU showed that the combination of techniques for preserving the facial nerve and statistical analysis gives the most optimal results in the elimination of parotid salivary gland tumors in middle-aged women. In clinical practice, special surgical instruments, microscopic vision, and neural monitoring systems are used. At the same time, AI algorithms help in the development of postoperative rehabilitation plans, taking into account the individual characteristics of the patient.

The research results showed that the integral integration of surgical technique, patient selection, tumor characteristics, and statistical processing approaches plays an important role in the prevention of facial nerve complications. At the same time, clinical and statistical approaches complement each other: statistical processing allows for a preliminary assessment of the patient's risk and optimization of surgical decisions, while clinical experience increases the accuracy of algorithms in real conditions.

The prospects for the future are also very broad. By further improving AI technologies, it is possible not only to predict facial nerve complications at the SamSMU clinic, but also to monitor the rehabilitation process and develop an individual treatment strategy. This will serve to create new standards in the field of dentistry and maxillofacial surgery.

Table 1. Postoperative Complications of the Facial Nerve in Parotid Salivary Gland Surgery.

Complication Type	Description	Frequency (%)	Duration	Clinical Impact
Temporary Muscle Weakness	Partial weakening of facial	35	2–6 weeks	Mild to moderate impact on

	muscles after surgery			facial expression
Decreased Sensitivity	Reduced sensation in facial regions	20	1–3 months	May affect patient comfort
Pain	Postoperative discomfort or neuralgia	15	1–2 months	Moderate impact on daily activities
Reflex Disorders	Impaired facial reflexes	10	1–4 weeks	Mild impact
Permanent Paralysis	Persistent facial muscle paralysis	5	6 months	Severe impact on facial expression and quality of life
Other Minor Complications	Includes swelling, hematoma, or transient nerve irritation	15	1–2 weeks	Minimal impact

Thus, with the help of statistical and AI approaches, it is possible to effectively solve the problems of reducing and predicting complications of the facial nerve in the elimination of benign tumors of the parotid salivary glands. Research conducted at the SamSMU clinic has created scientific experience in this direction, which serves to improve clinical practice and increase patient safety. At the same time, clinical and statistical approaches complement each other: statistical processing allows for a preliminary assessment of the patient's risk and optimization of surgical decisions, while clinical experience increases the accuracy of algorithms in real conditions.

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Conclusion. The results of the study showed that postoperative complications of the facial nerve in the elimination of benign tumors of the parotid salivary glands in middle-aged women are of serious importance in clinical practice. During the study, temporary or permanent dysfunctions of the facial nerve were identified, which is closely related to the surgical technique, patient characteristics, and tumor localization. Observations conducted at the SamSMU clinic, statistical analysis, and AI approaches revealed an increase in the possibility of predicting and reducing complications.

The study also showed that the combined use of techniques for protecting the facial nerve and modern statistical processing methods reduces postoperative complications, improves the quality of life of patients, and accelerates the rehabilitation process. The integration of clinical and statistical approaches contributes to the development of individual treatment strategies in maxillofacial surgery, ensuring patient safety, and the introduction of new standards in dental practice.

In general, this study created an important scientific and clinical basis for the development of practical recommendations for reducing and predicting complications of the facial nerve in the elimination of tumors of the parotid salivary glands. This approach will serve to make clinical practice more effective in the future and increase patient safety.

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