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Research Article

IMPROVING THE TREATMENT OF NERVE DAMAGE IN JAW FRACTURES

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ABSTRACT

According to the data of the World Health Organization (WHO), the frequency of injuries of the maxillofacial region is constantly increasing - their share in the total number of injuries is on average 6-8% per year. The purpose of the study is diagnosis of damage to nerve fibers in patients with facial bone injuries and improvement of treatment efficiency. In order to assess the frequency of nerve damage in maxillofacial injuries, in 2017-2020, archival materials and anamnesis of patients treated in the Department of Facial Injuries and Complications of Neuroinjuries of the Samarkand Branch of the Republican Specialized Traumatology and Orthopedic Scientific and Practical Medical Center (RITOIATM) were studied. 197 of them (86%) were men and 32 (14%) were women.

KEYWORDS

Maxillofacial injuries, diadynamic electroneurostimulation (DD-ENS), frequency of injuries,

INTRODUCTION

According to the data of the World Health Organization (WHO), the frequency of injuries of the maxillofacial region is constantly increasing - their share in the total number of injuries is on average 6-8% per year. According to statistics, the number of maxillofacial injuries with fractures of the facial skeleton in large cities has increased significantly and covers 42% of hospitalizations. In the last decade, the rate of injury to the population has increased dramatically. This is, first of all, a change in the social requirements of life, in particular, the stratification of the population's income, the further expansion of large cities, the increase in the number of vehicles and the speed of movement; especially in private

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enterprises, it is explained by non-observance of simple rules of equipment safety. Due to the above conditions, the number of facial bone injuries is increasing along with joint injuries. Worldwide, the incidence of facial trauma ranges from 15.5% to 59%. Most of the total share of injuries of the facial bones falls on the lower jaw bone, its share is 65-94%. Patients with this type of injury make up 22.4-33% of patients admitted to a facial surgery hospital. According to a number of authors, deformation of facial bones after combined craniofacial trauma is observed in 19-48%, damage of nerve fibers in 34-57%.

Karpov S.M. according to (2015), the bioelectrical activity of the brain changes and the process of adaptive activity of the nervous system is disturbed when the facial skeleton is fractured involving trigeminal nerve networks. At the same time, in patients with fractures of the facial bones, damage to the peripheral departments can seriously affect the course and prognosis of the main diseases.

Rahimov Z.K. (2022) focuses on the diagnosis of inflammatory complications and complex pathogenetic treatment of mandibular fractures. However, increasing the efficiency of complex treatment of patients with trigeminal nerve bundle injuries in fractures of the facial and jaw bones has not been fully elucidated, and the urgency of the problem continues to this day. All of the above-mentioned determine the purpose of this study, and for this reason, it is necessary to carry out these scientific studies.

The purpose of the study: Diagnosis of damage to nerve fibers in patients with facial bone injuries and improvement of treatment efficiency.

Material and research methods: In order to assess the frequency of nerve damage in maxillofacial injuries, in 2017-2020, archival materials and anamnesis of patients treated in the Department of Facial Injuries and Complications of Neuroinjuries of the Samarkand Branch of the Republican Specialized Traumatology and Orthopedic Scientific and Practical Medical Center (RITOIATM) were studied. 197 of them (86%) were men and 32 (14%) were women. By age, 145 (63.3%) patients were 18-30 years old and 84 (36.7%) were 31-50 years old.

The information of medical documents was studied, the general condition of patients at the time of arrival at the hospital, the presence or absence of symptoms of damage to peripheral nerve fibers, the nature of symptoms, the course and scope of diagnosis, the tactics and duration of treatment, the participation of medical specialists with other specialties in the treatment process were evaluated.

Based on the tasks set before the research being carried out, 60 patients with fractures of the middle and lower third of the face due to injury and damage to the trigeminal nerve networks as a result of this were

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assigned to 3 groups based on the essence of complex treatment measures, based on the method of random selection. distributed:

Group 1 included 20 patients undergoing surgical treatment (reposition of bone fragments, osteosynthesis immobilization) and traditional drug therapy.

The 2nd group was formed from 20 patients who received the local treatment complex - surgery and as an addition to traditional drug therapy, the drug "Neuromidin".

Group 3 was composed of 20 patients undergoing percutaneous diadynamic electroneurostimulation (DD-ENS) in order to restore the sensitivity and mobility of the peripheral branches of the trigeminal nerve to the treatment regimen consisting of surgery and traditional drug therapy and the addition of "Neuromidin" .

A control group was formed from 20 somatically healthy individuals with no injuries to the face-jaw area, no central and peripheral nervous system pathologies detected, in order to comparatively evaluate the physiological indicators of the research participants in the dynamics of the treatment and recovery process.

The results of scientific research were subjected to statistical analysis using the generally accepted method of variational statistics, using programs designed for medical and biological research. The data were entered into specially created tables for the Microsoft Office Excel 2010 program of the Windows XP operating system, as well as in the Stat Soft Statistica v6.0 statistical program. The obtained data were statistically processed using non-parametric methods (Mann-Whitney test) and correlation analysis (Pearson test). The results were presented as medians, the significance of differences between mean values was determined by Student's t-test. The principles of evidence-based medicine were used in the organization and conduct of research. Student's t-test was used (significance level 95%). Differences were considered reasonable in cases with a significance level of $r<0.05$.

Research results and discussions: 35 (58.3%) of hospitalized patients had an isolated fracture of the lower jaw, 15 (25%) had a fracture of the cheek bone and upper jaw, 10 (16.7%) had a fracture of the cheek bone and/or an isolated fracture of the cheekbone was diagnosed. 41 (68.3%) patients had displacement fractures, 19 (34.7%) had non-displacement fractures. Most of the patients - 38 (63.3%) were admitted to the hospital on the first day of injury, 11 (18.3%) - on the 2nd day, 7 (11.7%) - on the 3rd day, 4 (6.7%) – brought on the 4th day.

The analysis of the rehabilitation periods of patients, the speed of reparative processes in nerve tissue, and the degree of restoration of motor and sensory activity

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of damaged nerves showed the following. In 22 (31.4%) of 70 patients with sensory impairments, sensitivity in the innervated zone of the damaged nerve was restored in 3-3.5 months without additional drug therapy and physiotherapy. At the same time, patients who received injections and vitamin therapy achieved full recovery after an average of 1.5-2 months. Of the 87 patients with symptoms of nerve fiber damage, 15 (17.2%) had persistent peripheral nerve dysfunction, and 7 (8%) had muscle atrophy on the corresponding side of the face, indicating poor or no efficacy of the selected drug therapy.

In objective and X-ray examinations, it was found that 23 of 60 patients with fractures of the maxillofacial area did not have bone displacements (0.5-0.7 cm). Although the patients mainly complain of pain in the area where the fracture is located, the pricus disorder was not detected. 37 (61.7%) patients with displacement fractures complained of loss of skin sensation in the projection of the innervation zone of the peripheral branches of the trigeminal nerve (Fig. 1-2).

Out of 35 patients with mandibular fractures, 22 (62.9%) had open, deep and transverse fractures of the pricus, 13 (37.1%) had no pricus problems. It was found that 44 (73.3%) patients suffer from painful and limited opening of the mouth to one degree or another.

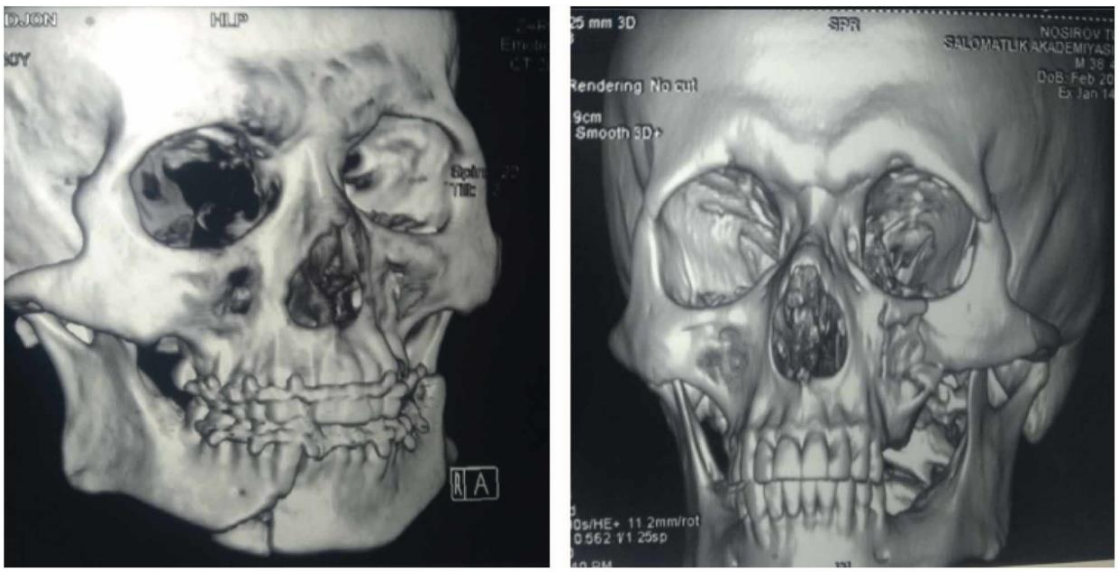

Figure 1. CT scan of fractures: on the left - image of the mandibular body taken from the right side; on the right - the image of the upper jaw and cheekbone taken from the left side

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Figure 2. Orthopantomography of the angle of the lower jaw fractured on the left side

It was found that all the patients included in the research had varying degrees of conduction disturbances along the nerve fibers, and this condition was proven during electrophysiological examinations.

Axonal and demyelination changes of trigeminal motor fibers in hypoesthetic diseases were clarified (prolongation of initial and subsequent reflex response components by 51.7% and 23.3%, respectively), 31 A decrease of 7% was noted.

Research of evoked trigeminal somatosensory (ETS) potentials during hyperesthetic changes showed the presence of structural peripheral damage, which was expressed in the prolongation of the latency period of the initial and subsequent ETS components, and their amplitude reduction.

In 11.7% of patients with hypoesthetic disorders, the initial components were lost, and the subsequent oscillations were characterized by low amplitude.

Trigeminal nerve damage was noted in 56.7% of patients with fractured cranial nerves and during electrophysiological examination sensory and paresthetic disorders were not detected by objective methods, in others, ENMG results of healthy and damaged sides and indicators of trigeminal ETS did not differ. Electrophysiological examinations conducted in patients with hypoesthetic changes made it possible to identify signs of axonal and demyelination damage of the motor fibers of the trigeminal nerve. In the ETS curve, it was observed that the latency period was lengthened, the amplitude of the initial components was reduced, the primary threshold for sensing electric

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stimulation was expanded, in 18.3% of cases it was found that the first components were missing, which indicates a serious structural defect.

Thus, in 100% of all patients with fractures of the face-jaw area examined in clinical conditions and by instrumental methods, it was found that nerve fibers were damaged. Trigeminal nerve involvement was found in 53.3% of cases with severe fracture, sensory and paresthetic disorders detected in clinical conditions. With the help of electrophysiological methods, in the absence of sensory-paresthetic changes, the interest of the trigeminal nerve was noted in 26.7% of cases. To sum up, the overall rate of trigeminal nerve damage in the fractures of the UJS was 78.3%.

By determining the zones of hypesthesia and hyperesthesia in the patients of the studied groups, by evaluating the condition and tone of the chewing muscles, disorders of one or another sensory and motor function of the peripheral branches of the trigeminal nerve were noted. All patients who were brought to the hospital as a result of fractures of the bones of the facial skeleton underwent electro-odontodiagnosis on the same day. But during the examination, the teeth in the fracture hole were not covered and they were removed according to the instructions. During EOD, no obvious disturbance of the sensitivity of the maxillary teeth was detected, the indicators were noted to be within the normal range, which is explained by the specific characteristics of the innervation of the maxillary teeth row (back, middle and anterior upper alveolar branches).

CONCLUSIONS

The low effectiveness of treatment measures aimed at restoring the activity of damaged nerves in patients, as well as the quality and efficiency of the specialized assistance provided by our algorithm in diagnosis, treatment and rehabilitation have been increased.

Early and late complications of orthopedic and surgical operations in facial bone fractures, depending on the level and severity of damage to the fibers of the trigeminal nerve, were studied. disturbances of one or another sensory and motor functions were noted, in particular, a severe level of nerve damage was noted in 13 (21.7%) cases where the bone fragments were displaced more than 1.0 cm. 29 (48.3%) cases with displacement of 0.5-1.0 centimeters were recognized as moderate, and cases with displacement up to 0.5 centimeters were recognized as mild displacement.

REFERENCES

1. Абдуллаев Ш.Ю. Остепластические материалы для ущерба дефектов и деформаций челюстно-лицевой области. / Ш.Ю. Абдуллаев, Н.В. Храмова // Стоматология. 2018. - Т. 59–60, № 1-2. - С. 98-101.

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2. Абдуллаев А. и др. ПОРОГ ВОЗБУДИМОСТИ ПРИ НЕВРИТЕ ВЕТВЕЙ ЛИЦЕВОГО НЕРВА //Центральноазиатский журнал образования и инноваций. – 2023. – Т. 2. – №. 6 Part 4. – С. 27-32.

3. Абрамов Н.В., Шарахова Е.Ф. Динамика основных показателей травматизма населения Кемеровской области // Сибирское мед. обозрение. 2019. - №2. -С. 41-44.

4. Байриков И.М., Логинов О.А., Савельев А.Л. и др. Сравнительный математический анализ применения накостных пластин для остеосинтеза отломков нижней челюсти //Вестник Вестник Российской Военно-Медицинской Академии. Приложение, 2019. - №1.- С. 65-66.

5. Бузрукзода Ж. Д. и др. УСТРАНЕНИЕ ПЕРФОРАЦИИ ДНА ВЕРХНЕЧЕЛЮСТНОГО СИНУСА С ПРИМЕНЕНИЕМ ОСТЕОПЛАСТИЧЕСКОГО МАТЕРИАЛА //Интернаука. – 2021. – №. 7-1. – С. 25-27.

6. Ерокина Н.Л. Ранняя диагностика осложненного течения перело¬мов нижней челюсти и обоснование иммунокоррекции: Автореф. дис. ... канд. мед. наук. - Волгоград, 2018. 16 с.

7. Жартыбаев Р.Н. Профилактика посттравматических осложнений при переломах нижней челюсти: / Дис. ... - Алма-Ата, 2008. 158 с.

8. Железный П.А. Результаты костной пластики нижней челюсти у де¬тей и подростков // Восстановительная хирургия челюстно-лицевой области. -М., 2015. - С. 107-109.

9. Иорданашвили А.К. Заболевания, повреждения и опухоли челюстно-лицевой области: руководство по клинической стоматологии / А.К. Иорданишвили - Санкт-Петербург, СпецЛит, 2007. 494 с.

10. Иорданишвили А.К., Слугина А.Г., Балин Д.В. и др. Возрастные особенности репаративного остеогенеза челюстей // Курский научно-практический вестник «Человек и его здоровье». 2014. № 3. - С. 15-21.

11. Калиновский Д.К., Матрос-Таранец И.Н., Алексеев С.Б. Совершенствование оказания медицинской помощи на этапах лечения и реабилитации пострадавших с травмами челюстно-лицевой области / Д. К. Калиновский, // Врач скорой помощи. - 2009. - № 5. - С. 18-24.

12. Alimdjanovich R. J., Abdullaev A. S. PASTKI ALVEOLYAR NERV YALLIG'LANISHINI DAVOLASHDA NUKLEO CMF FORTE NING O'RNI //Евразийский журнал медицинских и естественных наук. – 2022. – Т. 2. – №. 5. – С. 82-92.

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SJIF IMPACT FACTOR (2021: 5. 694) (2022: 5. 893) (2023: 6. 184)
OCLC – 1121105677
Publisher: Oscar Publishing Services

13. Alimdzhanovich R. J., Sarkhadovich A. A. Prospects for the treatment of neuritis in fracture of the lower jaw //ACADEMICIA: An International Multidisciplinary Research Journal. – 2022. – Т. 12. – №. 4. – С. 712-717.
14. Abdullaev A., Turopov F., Narzikulov D. POSTTRAUMATIC NEURITIS OF THE INFERIOR ALVEOLAR NERVE //Бюллетень студентов нового Узбекистана. – 2023. – Т. 1. – №. 6 Part 2. – С. 67-70.
15. Fayzullaev U. R., Sarkhadovich A. A. A METHOD FOR INCREASING THE EFFECTIVENESS OF CHON-DROPROTECTIVE THERAPY IN PATIENTS WITH TMJ ARTHRITIS-ARTHROSIS ACCOMPANYING CERVICAL OSTEOCHONDROSIS //Asian journal of pharmaceutical and biological research. – 2022. – Т. 11. – №. 2.
16. Sarkhadovich A. A., Saidalimovich K. A., Alimdjanovich R. J. ПОРОГ ВОЗБУДИМОСТИ ПРИ НЕВРИТЕ НИЖНЕАЛЬВЕОЛЯРНОГО НЕРВА //JOURNAL OF BIOMEDICINE AND PRACTICE. – 2022. – Т. 7. – №. 4.
17. Turanboyev B., Abdupattayev A., Abdullaev A. INFLYATSIYANING QIMMATLI QOG'OZLAR DAROMADIGA TA'SIRI //Yosh Tadqiqotchi Jurnali. – 2023. – Т. 2. – №. 2. – С. 88-100.