FRONTLINE MEDICAL SCIENCES AND PHARMACEUTICAL JOURNAL (ISSN – 2752-6712)
VOLUME 02 ISSUE 10 Pages: 01-09
SJIF IMPACT FACTOR (2021: 5.14) (2022: 5.605)
OCLC – 1272874727 METADATA IF – 6.986
Publisher: Frontline Journals

Journal Website: https://frontlinejournals.org/journals/index.php/fmspj

Research Article

RESULTS OF COMPREHENSIVE CLINICAL AND RADIATION DIAGNOSTICS OF COMBINED INJURIES OF THE PARANASAL SINUSES

Submission Date: October 05, 2022, **Accepted Date:** October 10, 2022,
Published Date: October 21, 2022
Crossref doi: https://doi.org/10.37547/medical-fmspj-02-10-01

B.I. Karimberdiev
Researcher Tashkent Medical Academy, Uzbekistan

Sh.Kh. Bakieva
Researcher Tashkent Medical Academy, Uzbekistan

ABSTRACT

Combined injuries of the paranasal sinuses (SPON) in 95% are combined with injuries of the facial bones and skull. The presence of damage to the paranasal sinuses (SNP) in this category of patients is characterized by a high incidence of infectious complications, which manifest themselves both in the early and later periods after the injury. The frequency of complications in combined injuries reaches 80% or more, mortality from 33% to 90% [1-5].

KEYWORDS

Paranasal sinuses, epithelium, maxillofacial region, bones and skull, facial skeleton, radiography.

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INTRODUCTION

Post-traumatic sinusitis occurs in patients who are on a ventilator for a long time, they have impaired ventilation of the paranasal sinuses and this leads to congestion in the sinuses. These changes are a favorable background for the development of inflammatory processes [6,7,8,9,10].

Often, trauma to the walls of the paranasal sinuses is accompanied by damage and blockage of the natural excretory openings, which leads to the filling of the sinuses with blood, which is a breeding ground for microorganisms. In the dynamics of the course of a traumatic disease, due to a decrease in the activity of the ciliated epithelium, an increase in the volume of mucus and a violation of the evacuation of the contents of the sinuses and functional changes in the nasal mucosa, conditions are created for suppuration of the hemosinus [11-14].

Therefore, the development of tactics for medical and diagnostic care, the determination of the timing of the rehabilitation of the paranasal sinuses in case of its damage, the study of the state of the functional characteristics of the nose in patients with combined trauma of the maxillofacial region and the brain are an unresolved problem of modern medicine.

MATERIAL AND METHODS

This scientific work is based on the results of a survey of 142 patients with concomitant SNP injuries. All patients received inpatient treatment in the department of adult ENT and maxillofacial surgery, neurosurgery, traumatology, anesthesiologists and resuscitation at the multidisciplinary clinic of the Tashkent Medical Academy in the period from 2018 to 2021. The age of the patients was from 18 to 68 years, out of 142 patients there were 112 men (78.8%), women 30 (21.2%).

RESULTS AND DISCUSSION

In the second chapter of this dissertation, the material of a clinical study is analyzed, which is based on the results of a survey of 142 patients with concomitant SNP injuries. Patients received inpatient treatment at the multidisciplinary clinic of the Tashkent Medical Academy in the period from 2018 to 2021.

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There were more men in the material, they made up 78.8%, there were fewer women, they made up only 21.2%. The mean age of the surveyed averaged 43.4±2.1 years. An analysis of the hospitalized showed that 91.5% (130 people) of the patients were delivered on the first day after the injury, and 7% (10 people) of the patients were delivered on the 2nd day, only 1.4% (2 people) were delivered on the 3rd day after injury.

It was noted that 76.7% of patients had a closed craniocerebral injury, 3.6% of patients had an open craniocerebral injury, 7.7% of patients had a brain contusion, and 12% of patients had brain damage. was not noted, they had other types of combined trauma.

The general condition of the patients and the severity of the injury depended on the type of concomitant injury, brain damage, blood loss, shock, and the duration of first aid.

2.8% of patients had a skull fracture, and 10.6% of patients had a fracture of the naso-zygomatic-orbital complex, 2.8% had a fracture of the zygomatic bone, 2.1% of patients had a fracture of the upper jaw, 15 4% of patients had a fracture of the walls of the orbit, 13.4% of patients had damage to soft tissues with a violation of their integrity, 48.6% of patients had a bruise and hematoma of the soft tissues of the face, and the remaining 4.3% of patients had combined multiple injuries of the facial skeleton.

An objective examination of patients served to establish a preliminary diagnosis, and the final diagnosis was made on the basis of the radiological method of examination (Table 1).

Table 1

Symptoms of combined damage to the PNs n=142 (100%)

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Sympoms	Quantity	
	abs	%
Edema and hematomas in the frontal, paranasal region	46	32,3
Edema of the periorbital, infraorbital region	49	34,5
Swelling of the upper and lower lips	47	33,2
Eyeball hemorrhage	42	29,5
Step symptom	42	29,5
Crepitus and pain in the affected area	52	36,6
Decreased sensitivity of the skin	49	34,5
The presence of subcutaneous emphysema	37	26
Cracked Pot Symptom	35	24,6

Post-traumatic edema and hematomas were noted in the frontal, paranasal (n=46; 32.3%), periorbital, infraorbital regions (n=49; 34.5%), as well as the upper and lower lips (n=47; 33.2%). Subcutaneous hematomas in the area of injury, hemorrhage of the eyeball were often determined (n=42; 29.5%).

Palpation of soft and bone tissues in the area of damage made it possible to determine the symptoms of a step (n=42; 29.5%), crepitus and soreness of the damaged area (n=52; 36.6%), in addition, a decrease or loss of sensitivity of the skin was determined (n=49; 34.5%), the presence of subcutaneous emphysema (n=37; 26%), the symptom of a cracked pot (n=35;

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24.6%) in case of damage to the anterior wall of the maxillary sinus.

On examination, the presence of nosebleeds (n=56; 39.4%), limitation of eyeball movement (n=37; 26%), restriction when opening the mouth (n=41; 29%), the integrity of the mucous membrane, the presence of it has submucosal hematomas (n=31; 21.8%), the presence of damage to the teeth (n=31; 21.8%) (Table 2).

Table 2

Objective examination of combined PNs injuries n=142 (100%)

Objective signs	Quantity	
	abs	%
Nosebleeds	56	39,4
Restrictions on eyeball movement	37	26,4
Restriction when opening the mouth	41	28,7
Damage to the oral mucosa	31	21,8
Tooth damage	31	21,8
Hemorrhages of the submucosal cavity of the nose	51	36
The presence of blood clots in the nasal cavity	62	43,6
Hematoma of the nasal septum	51	36
Deviations of the nasal septum	41	29

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Allocation of fresh blood from the natural anastomosis	62	43
Serous discharge from natural fistula	21	15
Purulent discharge from the natural anastomosis	3	0,02
Presence of diplopia	32	22,5

During endoscopic examination of the nasal cavity, hemorrhages of the submucosal nasal cavity were determined (n=51; 36%), the presence of blood clots in them (n=62; 43.6%), the condition of the turbinates, the condition of the nasal septum, paid attention to the state of natural fistulas, secretions in them.

Hematoma of the nasal septum was determined in (n=51; 36%), the presence of curvature of the nasal septum was noted in (n=41; 28.7%), patients, the presence of fresh blood from the natural anastomosis was detected in (n=62; 43%) , serous discharge in (n=21; 15%), purulent discharge in (n=3; 0.02%) patients. Purulent discharge was determined in patients who had a history of chronic inflammation in the maxillary sinus. Asymmetric pupillary line, diplopia when looking up/down and left/right were identified in (n=32; 22.5%) patients.

All patients, depending on the area of damage, we divided into 3 groups:

Group 1 consisted of 46 patients with combined damage to the walls of the frontal sinus.

The 2nd group consisted of 49 patients with combined injuries of the ethmoid sinus, naso-zygomatic-orbital complex.

Group 3 consisted of 47 patients with combined injuries of the walls of the maxillary sinus.

Data from 20 healthy individuals served as controls.

Each group had features of the course of traumatic disease, it depended on the location of the injury, brain damage, on the extent of damage to the bone structure in the associated injury.

When using radiation methods for diagnosing a combined injury, we paid attention to the state of

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bone fragments, the presence of their displacement, violations of the integrity of the bone structures of the facial skeleton and skull.

Particular attention was paid to the state of the bone walls of the paranasal sinuses, their displacement, the presence of a foreign body and the content of the sinus.

We used radiography of the paranasal sinuses when patients were admitted to the emergency department in two projections, i.e. in direct and lateral projection. However, radiography of the paranasal sinuses does not always give an objective assessment of the state of bone fragments. Especially with injuries of the middle zone of the facial skeleton, radiography is not always informative, due to the layering of the bone structures of the craniofacial complex.

Therefore, on the next day after the admission of patients to the hospital, we performed CT or MSCT studies. X-ray of the paranasal sinuses was performed in (n=37; 26.5%) patients.

CT of the SNP was performed in (n=41; 28.7%) patients, MSCT of the SNP in bone mode with three-dimensional reconstruction was performed in (n=64; 45.7%) patients.

However, radiography and CT of the SNPs reproduce the image in a two-dimensional plane, do not sufficiently determine the state of the walls of the SNPs, providing only indirect information about their condition: violation of the integrity of the infraorbital margin, darkening of the maxillary sinus, and in some cases blurred visualization of bone structures.

CONCLUSION

For an objective assessment of the volume, quantity and relative position of bone fragments of the walls of the SNP, the above methods of radiation diagnostics are not informative. To plan the surgical treatment of SNPs, we studied the 3D anatomy of SNPs. 3D anatomy of the SNP allowed us to diagnose the location of the injury, its nature, as well as visualization images in three planes.

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