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FREQUENCY ANALYSIS OF ISOLATED AND COMBINED LESIONS OF THE MAXILLARY AND FRONTAL SINUSES ACCORDING TO X-RAY DATA

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One of the actual problems of modern otorhinolaryngology is a significant increase in the incidence of paranasal sinuses, in particular acute and chronic sinusitis, which, according to the literature, is 1.5-2% per year. The purpose of our research was to study and compare the frequency of isolated and combined sinusitis of the maxillary and frontal sinuses according to radiographic examination data.

100 anonymized radiographs of persons of mature age (50 men and 50 women) who were examined by referral for inflammatory lesions of the paranasal sinuses were analyzed. All images were taken in the occipito-mental projection according to Waters, which allowed visualization of the maxillary and frontal sinuses.

Different variants of isolated or combined inflammatory lesions of the maxillary and frontal sinuses were found in the studied sample. Signs of one- or two-sided catarrhal or exudative sinusitis were observed in all processed X-rays. In 84% of the examined persons, a lesion of only the maxillary sinuses was diagnosed, in 16% of the examined, a combined lesion of the maxillary and frontal sinuses was detected. Not a single case of isolated frontitis was found in the studied sample.

According to radiographic examination, inflammatory processes in the maxillary sinuses are observed 6 times more often than in the frontal sinuses. Isolated lesions of the maxillary sinuses are found 5 times more often than combined lesions of the maxillary and frontal sinuses.

Key words: *maxillary sinuses, frontal sinuses, sinusitis, frontitis, radiography.*

Connection of the publication with planned research works.

The study was carried out as part of the comprehensive research work of the Department of Normal Anatomy and the Department of Operative Surgery with Topographic Anatomy of Danylo Halytsky Lviv National Medical University “Morphofunctional features of organs in the pre- and postnatal periods of ontogenesis, under the influence of opioids, nutritional supplements, reconstructive surgery and obesity” (state registration number 0120U002129).

Introduction.

One of the actual problems of modern otorhinolaryngology is a significant increase in the incidence of paranasal sinuses, in particular acute and chronic sinusitis, which, according to the literature, is 1.5-2% per year [1, 2]. At the same time, literary sources certif the uneven frequency of lesions of different paranasal sinuses. According to Paulsson B et al. (2001) and Alekseeva V.V. (2021) diseases of the posterior group of sinuses (sphenoid and posterior cells of the ethmoidal labyrinth) are much less common than those of the front (maxillary, frontal, anterior and middle cells of the ethmoidal labyrinth) [3, 4]. Other authors claim that pathological processes develop more often in the maxillary sinuses and cells of the ethmoidal labyrinth, much less often in the frontal sinuses, while emphasizing the more severe clinical course of frontitis [5].

Numerous scientific investigations are devoted to the study of the morphological structures of the paranasal sinuses and the diagnostic criteria for their lesions of various etiologies [6-9].

The aim of the study.

To study and compare the frequency of isolated and combined sinusitis of the maxillary and frontal sinuses according to radiographic examination data.

Object and research methods.

100 anonymized radiographs of persons of mature age (50 men and 50 women) who were examined by referral for inflammatory lesions of the paranasal sinuses were analyzed. All images were taken in the occipito-mental projection according to Waters, which allowed visualization of the maxillary and frontal sinuses.

Research results and their discussion.

Different variants of isolated or combined inflammatory lesions of the maxillary and frontal sinuses were found in the studied sample **(fig.).**

Signs of one- or two-sided catarrhal or exudative sinusitis were observed on all processed X-rays.

In 84% of the examined persons, including 43 men (86% of all examined men) and 41 women (82% of all examined women), lesions of only the maxillary sinuses were diagnosed. In 16% of the examined, including 9 men (18%) and 7 women (14%), a combined lesion of the maxillary and frontal sinuses was found.

Among the examined men with an isolated lesion of only the maxillary sinuses, the share of persons with unilateral catarrhal sinusitis was 22% (10% on the right, and 12% on the left). The proportion of men with bilateral catarrhal sinusitis was also 22%, and the share of men with bilateral exudative sinusitis was 24%. Unilateral exudative sinusitis was found in 14% of examined men, including 6% on the right and 8% on the left.

The share of women with catarrhal sinusitis was 50% of the total number of examined women. At the same time, 30% of the examined women had bilateral

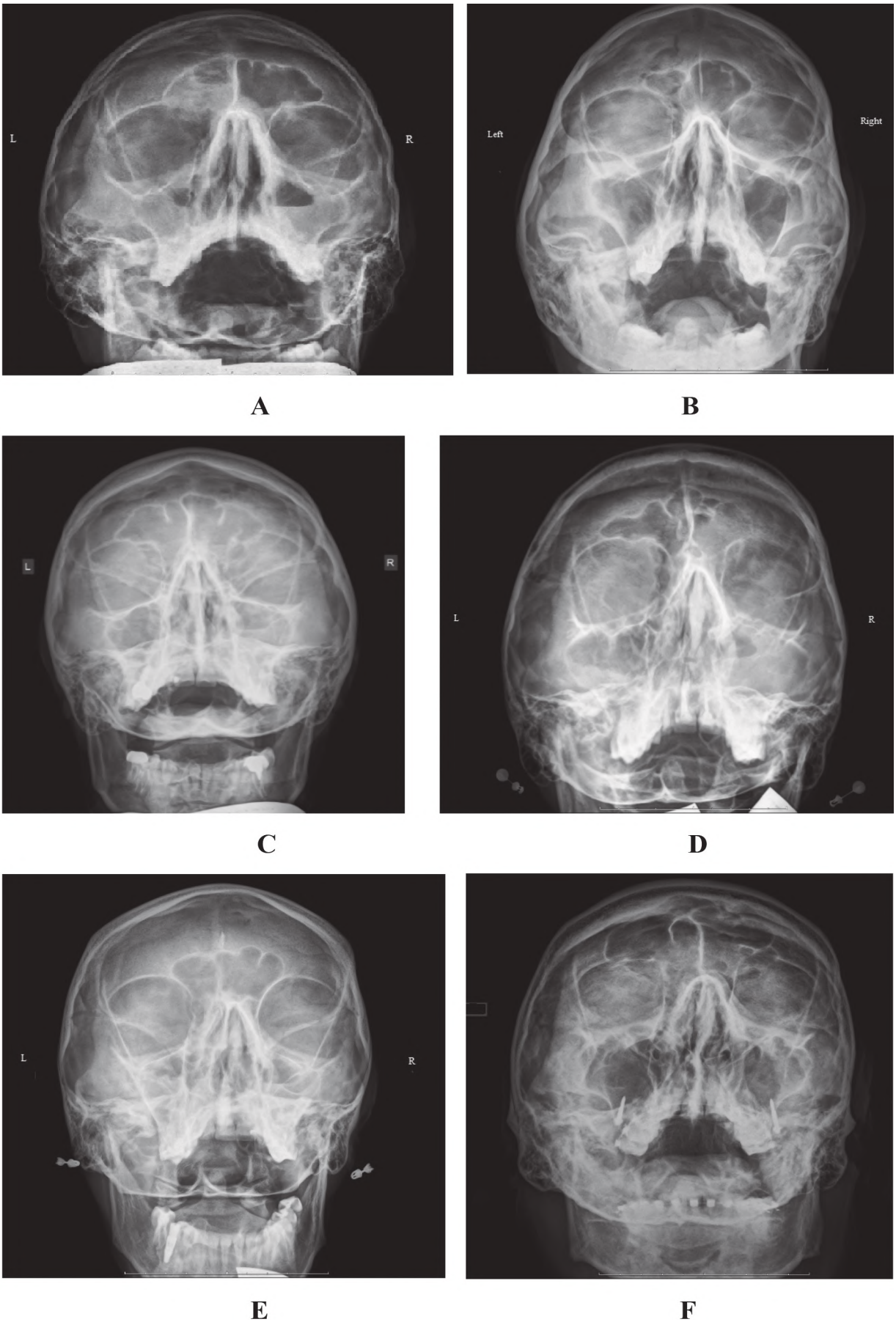

Figure – Radiographs of the paranasal sinuses in the direct projection according to Waters: A – bilateral exudative sinusitis; left-sided exudative frontitis; B – left-sided catarrhal hemisinusitis; C – right-sided exudative hemisinusitis; D – right-sided exudative hemisinusitis; left-sided catarrhal sinusitis; E – bilateral exudative sinusitis; F – bilateral catarrhal front; left-sided catarrhal sinusitis.

catarrhal sinusitis, and 10% had unilateral catarrhal sinusitis on the right and on the left. The share of women diagnosed with exudative sinusitis was 36%, including bilateral exudative sinusitis in 16% of examined women and unilateral exudative sinusitis in 20% (12% and 8%, respectively, on the right and left).

Bilateral combined lesions of the maxillary and frontal sinuses were found in 4% of the examined – among men and women, such a combined pathology was diagnosed with the same frequency – 4% each. Unilateral lesions of the maxillary and frontal sinuses were found in 7% of cases – 6% in men and 8% in women. At the same time, a unilateral lesion of the maxillary and frontal sinus on the right was found in 4% of men and 4% of women, on the left – in 2% of men and 4% of women.

Another 5% of the examined (6% of men and 4% of women) had other variants of combined lesions of the maxillary and frontal sinuses. A combination of bilateral sinusitis with unilateral frontitis was found in 4% of men and 4% of women. Another 2% of men had bilateral frontitis in combination with left-sided sinusitis.

Not a single case of isolated frontitis was found in the studied sample.

Tyshko FO et al. (2013) indicate that the X-ray picture of inflammatory processes of the frontal sinuses does not always correspond to their clinical manifestations [10]. That is why, as well as taking into account the significant frequency of combined lesions of the maxillary and frontal sinuses confirmed by the results of our study, we consider it appropriate to recommend X-ray examination of patients with sinusitis in the occipito-mental projection according to Waters, which allows visualization of the maxillary and frontal sinuses at the same time, makes it possible to establish a reliable diagnosis and choose the optimal method of treatment [1, 2, 10].

Conclusions.

1. The x-ray method of examining the paranasal area with taking scans in the occipito-mental projection according to Waters allows visualization of inflammatory lesions (catarrhal and exudative) of the maxillary and frontal sinuses.

2. According to radiographic examination, inflammatory processes in the maxillary sinuses are observed 6 times more often than in the frontal sinuses.

3. Isolated lesions of the maxillary sinuses are detected 5 times more often than combined lesions of the maxillary and frontal sinuses.

4. In 16% of people with x-ray confirmed lesions of the maxillary sinuses, signs of the inflammatory process in the frontal sinuses were also found.

Prospects for further research.

The results of the study of various variants of combined inflammatory lesions of the paranasal sinuses and the frequency of their detection will allow predicting the course of sinusitis of various etiology and localization, as well as optimizing the methods of their correction.

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АНАЛІЗ ЧАСТОТИ ІЗОЛЬОВАНИХ ТА ПОЄДНАНИХ УРАЖЕНЬ ВЕРХНЬОЩЕЛЕПНИХ ТА ЛОБОВИХ ПАЗУХ ЗА ДАНИМИ РЕНТГЕНОГРАФІЇ

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Резюме. Численні наукові дослідження присвячені вивченню морфологічної будови приносових пазух та діагностичних критеріїв їх уражень.

Мета роботи: дослідження та порівняння частоти ізольованих та поєднаних синуситів верхньощелепних та лобових пазух за даними рентгенографічного обстеження.

Об’єкт і методи дослідження. Проаналізовано 100 анонімізованих рентгенограми осіб зрілого віку (50 чоловіків та 50 жінок), які проходили обстеження з приводу запальних уражень приносових пазух. Всі знімки були виконані в потилично-підборідній проекції за Уотерсом.

Результати дослідження. В опрацьованій вибірці виявлено різні варіанти ізольованих або поєднаних запальних уражень верхньощелепних та лобових пазух. У 100% обстежених спостерігали ознаки одно- або двохстороннього гайморииту. У 84% обстежених осіб діагностовано ураження лише верхньощелепних пазух, у 16% – поєднане ураження верхньощелепних та лобових пазух. Частка чоловіків з одностороннім катаральним гайморитом становила 22% з двостороннім катаральним гайморитом також 22%, з двостороннім ексудативним гайморитом – 24%, з одностороннім ексудативним гайморитом – 14%. Частка жінок з двостороннім катаральним гайморитом становила 30%, з одностороннім – 20%, з двостороннім ексудативним гайморитом

– 16%, з односторонній – 20%. Двостороннє поєднане ураження верхньощелепних та лобових пазух виявлено у 4% обстежених, одностороннє – у 7%. Жодного випадку ізольованого фронтиту в опрацьованій вибірці не виявлено.

Висновки. За даними рентгенографічного обстеження запальні процеси у верхньощелепних пазухах спостерігаються у 6 разів частіше, ніж у лобових. Ізольовані ураження верхньощелепних пазух виявлено у 5 разів частіше, ніж у поєднанні ураження верхньощелепної та лобової пазух.

Ключові слова: верхньощелепні пазухи, лобові пазухи, гайморит, фронтит, рентгенографія.

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Research results. Different variants of isolated or combined inflammatory lesions of the maxillary and frontal sinuses were found in the studied sample. Unilateral or bilateral symptoms of sinusitis were observed in 100% of examined individuals. In 84% of the examined individuals, the lesions of only maxillary sinuses were diagnosed, in 16% – a combined lesion of the maxillary and frontal sinuses The specific share of men with unilateral catarrhal sinusitis was 22%, with bilateral catarrhal sinusitis also 22%, with bilateral exudative sinusitis – 24%, with unilateral exudative sinusitis – 14%. The share of women with bilateral catarrhal sinusitis was 30%, with unilateral – 20%, with bilateral exudativesinusitis – 16%, with unilateral – 20%. Bilateral combined lesion of the maxillary and frontal sinuses found in 4% of the examined individuals, unilateral – in 7%. There was not a single case of isolated frontitis in the studied sample.

Conclusions. According to radiographic examination, inflammatory processes in the maxillary sinuses are observed 6 times more often than in the frontal sinuses. Isolated lesions of the maxillary sinuses are found 5 times more often than combined lesions of the maxillary and frontal sinuses.

Key words: maxillary sinuses, frontal sinuses, sinusitis, frontitis, radiography.

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Conflict of interest:
The authors declare no conflict of interest.

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