

Chronic odontogenic maxillary sinusitis

Paulius Ugincius, Ricardas Kubilius, Albinas Gervickas, Saulius Vaitkus

SUMMARY

The aim of the present study was to estimate average age of the patients in both sexes treated for MS, distribution by sex, amount of dexter and sinister MS with and without the fistulas into the maxillary sinus, with and without the foreign – bodies, length of stay in the Department of Maxillofacial Surgery at Kaunas Hospital of University of Medicine during the period from 1999 till 2004.

The retrospective data analysis of the patients' treated from chronic MS was made. 346 patients (213 females and 133 males) were treated for chronic MS. 55 cases of chronic dexter MS with a fistula into maxillary sinus, 98 cases of chronic dexter MS without a fistula, 45 cases of chronic sinister MS with a fistula, 112 cases chronic sinister MS without a fistula, 16 cases of foreign – bodies in dexter maxillary sinus, 20 cases of foreign – bodies in sinister maxillary sinus have been detected.

The main age of the female was 46.6 ± 15.0 , the main age of the men was 42.1 ± 14.4 . Statistically significant difference in the age difference of the women and the men was found ($p=0.0024$).

It was determined, that females diagnosed and treated with chronic MS were 1.6 times more than males during the period from 1999 till 2004 in Kaunas Hospital of University of Medicine. Females treated for chronic MS were 4.5 years older than males.

Key words: chronic odontogenic maxillary sinusitis, females, males, age difference, treatment.

INTRODUCTION

Inflammation of mucosa of maxillary sinus – maxillary sinusitis (MS) is a relatively common condition not in Lithuania only but in other countries also. MS occur approximately 31 million people per year (1/8 of all citizens in the United States of America) [4]. There are not statistical data about frequency of this condition in Lithuania, but there are some reasons to think that frequency of MS is much more bigger than in the United States of America, because most of patients do not carry enough about their health, their attitude to disease is too late, the disease far – goes. This condition could be avoided in most cases. This is influenced by the mechanisms of pathogenesis of the disease.

According to various investigators, the morbidity of chronic MS in various regions is 5-15 percent.

MS can be influenced by a lot of factors: allergy, immunosuppressive conditions, bronchial asthma, arterial hypertension, Vidal's syndrome, polyposis of a nose, complicated and various anatomy of lateral wall of a nose.

Depending on the agents, viral, bacterial and fungal MS are classified.

The most often agents are these: *Peptostreptococcus spp.*, *Bacteroides spp.*, *Haemophilus influenzae*, *Streptococcus pneumoniae*, rarely – *Moraxella catarrhalis*, *Streptococcus pyogenes*, *Streptococcus intermedius*, *Veillonella*, *Coliform bacilli*. *Staphylococcus aureus*, *Beta-hemolytic streptococcus*, *Alpha-hemolytic streptococcus*, *Rhinovirus*, *Influenza virus*, *Parainfluenza virus* are typical for the rhinogenic MS [3]. There are diagnosed more and more sinusites of fungal origin (*Candida*, *Aspergillus*, *Zygomycetos*) in recent years. It is related with suppressed immune system of a human.

Intimate anatomical relation of the upper teeth to the maxillary sinus promotes the development of odontogenic MS. The bony wall, separating maxillary sinus from teeth roots varies from full absence, when teeth roots are covered only by mucous membrane, to the wall of 12 mm [1]. Then roots of 1st, 2nd molars' and the 2nd premolars' are covered only by mucous membrane and sometimes even protrude into maxillary sinus [4]. Maxillary sinus usually is situated over the 1st, 2nd molar but it can reach the 3rd molar and the 1st premolar in front or even fang tooth and MS develops when graining or grainmatotic periodontitis, subperiosteal abscessus of these teeth occur. MS also can develop because of the maxillary osteomyelitis, radicular cystis of teeth. MS can develop after mechanical injury of sinus mucosa during endodontic teeth treatment, when root canals of teeth are overfilled by tooth-filling material. Also it can develop because of the fistulas after teeth extractions, when a tooth implant is implanted incorrectly or other foreign-bodies that penetrated into the sinus from oral cavity (fragments of dental instruments, dental roots, turundas, etc.), when in-

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Table 1. Distribution of the patients according to sex, kinds of anaesthesia applied during the surgery and previous conservative treatment

Years	Males (n)	Females (n)	Total (n)	General anaesthesia	Combined anaesthesia	Conservative treatment
1999	16	26	42	12	27	3
2000	11	36	47	5	36	6
2001	31	36	67	13	48	6
2002	28	46	74	22	44	8
2003	16	29	45	15	28	2
2004	29	42	71	13	51	7
1999-2004	131	215	346	80	234	32

Table 2. The distribution of the maxillary sinusitis MS according to the clinical feature and the side of the damaged maxillary sinus

The clinical features of the MS and the side of the maxillary sinus	Cases
Chronic dexter MS with a fistula into the maxillary sinus	55
Chronic dexter MS without a fistula into the maxillary sinus	98
Chronic sinister MS with a fistula into the maxillary sinus	45
Chronic sinister MS without a fistula into the maxillary sinus	112
Foreign – bodies in a dexter maxillary sinus	16
Foreign – bodies in a sinister maxillary sinus	20

flammation of retained teeth occurs. MS can develop after trauma of sinus walls, surgical treatment of nasal cavity, after a nose tamponada procedure.

The aim of the present study was to estimate average age of the patients in both sexes treated for MS, distribution by sex, amount of dexter and sinister MS with and without the fistulas into the maxillary sinus, with and without the foreign-bodies, length of stay in the Department of Maxillofacial Surgery at Kaunas Hospital of University of Medicine during the period from 1999 till 2004.

MATERIAL AND METHODS

Retrospective clinical data analysis of the patients' diagnosed and treated for chronic or chronic exacerbated MS at the Department of Maxillofacial Surgery of Kaunas Hospital of University of Medicine during the period from 1999 till 2004 was made.

The patients were divided into groups on the basis of the clinical picture, the side of maxillary sinus damaged by MS and the cause:

1. Patients with a dexter MS with a fistula into the maxillary sinus.
2. Patients with a dexter MS without a fistula into the maxillary sinus.
3. Patients with a sinister MS with a fistula into the maxillary sinus.
4. Patients with a sinister MS without a fistula into the maxillary sinus.
5. Patients with a foreign – body in a dexter maxillary sinus.
6. Patients with a foreign body in a sinister maxillary sinus.

The patients were divided into these age groups: 18-30, 31-40, 41-50, 51-60, 61-70, 71 and elder.

It was determined the average of age of both sexes, the average length of stay in the Department because of the MS, the way of anaesthesia during the surgical intervention, the cases of conservative, combined, surgical treatment.

Statistical analysis was performed using Statistical Package of Microsoft Exel software. The mean \bar{x} and standard deviation $S_{\bar{x}}$ were used as descriptive values. Student's t-test was used to compare the results.

RESULTS

There have been 346 patients (133 males and 213 females) with chronic or chronic exacerbated MS treated at the Department of the Maxillofacial Surgery of Kaunas Hospital of University of Medicine between 1999 and 2004. The distribution of the patients according to sex, kinds of anaesthesia applied and treated by conservative treatment are represented in Table 1.

After evaluating the complaints of the patients, clinical, radiological, blood data it was determined the amount of the MS without and with a fistula into the maxillary sinus, foreign-bodies and the side of the maxillary sinus damaged by MS (Table 2).

Maxillary osteomyelitis was detected in two cases, phlegmon of buccae of dexter side, phlegmon of dexter orbita, abscessus of the retrobulbar region, neuralgia of the 2nd branch of the trigeminal nerve, neuritis of the 2nd branch of the trigeminal nerve, hypovolemic shock, abscessus of frontal region, sepsis, allergy to medicaments, acute parotitis were detected by one case combined with MS among the patients treated at the Department of the Maxillofacial Surgery at Kaunas Hospital of University of Medicine during the period from 1999 till 2004.

Dental roots have been detected in 3 cases in the dexter maxillary sinus and in 6 cases in the sinister maxillary sinus of all foreign-bodies which were detected in these sinuses (Table 2). Incorrectly implanted dental implant as a reason of MS was detected in one case. Chronic MS with a fistula into the sinus was detected in 28.9 percent of all cases of chronic MS, chronic MS, developed because of the foreign-body in the maxillary sinus, was detected in 10.4 percent of all cases of chronic MS.

The distribution of the patients treated for chronic MS according to the age is shown in Figure 1.

The average length of stay there was 7.5 ± 5.1 days for male and 7.4 ± 4.5 for female. No statistically signifi-

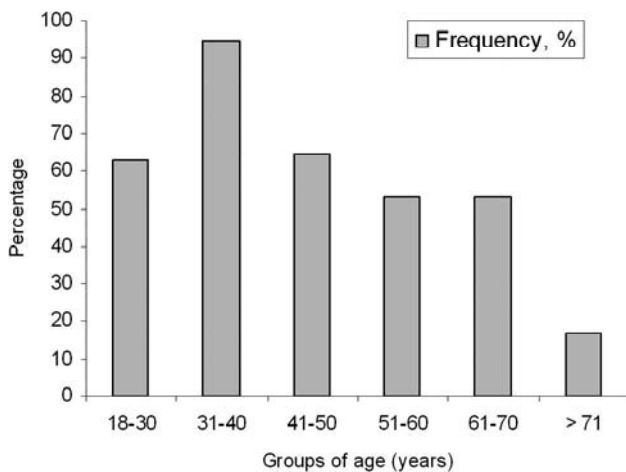


Fig. 1. The distribution of the patients according to the age

cant difference in the length of stay of males and females was found ($t=0.18, p=0.43$).

The main age of the males there was 42.1 ± 14.4 (ranging between 18 and 75), the main age of the females there was 46.6 ± 15.0 (ranging between 19 and 96). Statistically significant difference in the age difference of males and females was found ($t=-2.84, p=0.0024$).

Clinical symptoms, methods of examination and treatment

Subjective clinical symptoms

Patients have complained of a unilateral nasal obstruction, offensive odour, nasal discharge (purulent, watery, mucoid), frontal headache that intensifies on bending and

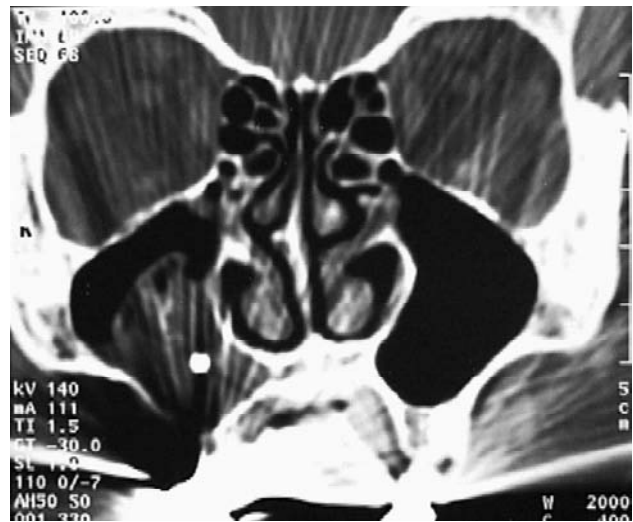


Fig. 2. Computed tomography of the patient, suffering from chronic MS of rigzt side

in the evening. Symptoms also included nagging pain of the upper teeth of the damaged side, which intensifies by occluding teeth and mobility of the teeth. Pains, typical for irritability of infraorbital nerve, i.e. hyperesthesia – pains, that spread to the temple, brow – were registered. Afterward hypoesthesia of infraorbital nerve may take place.

Objective clinical symptoms

Causal tooth is sensitive to the percussion, intermediate line is painful due to palpation. Disorders of senses of the area of infraorbital nerve innervation take place.

Orthopantomograph and computed tomography were made (Figures 2, 4) in cases of chronic MS.

An object of a high density in the right maxillary sinus of the patient suffering from chronic MS is seen in



Fig. 3. Conglomerate of the colonies of fungus from maxillary sinus



Fig. 4. Orthopantomograph of the patient with peas in the right maxillary sinuss

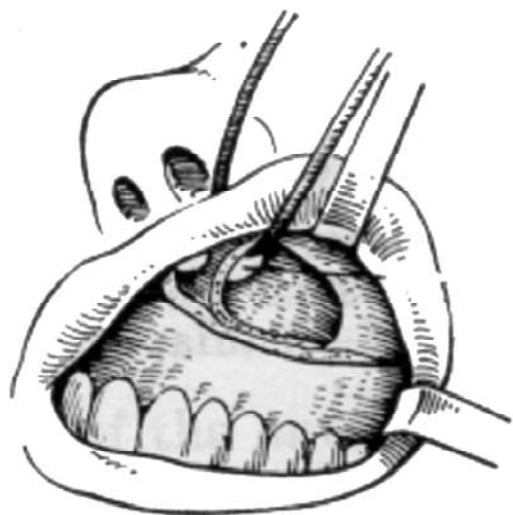


Fig. 5. Scheme of radical operation of maxillary sinus

Figure 2. Such a view is typical for chronic MS of the fungal origin. The object is calcified, so it presents a high contrast. These are calcified colonies of the fungus. This object does not restrict to the lateral walls of maxillary sinus. Native preparation removed from the maxillary sinus during the surgical intervention (Figure 3) is examined histologically.

A case report

Patient, 35-year-old female, was admitted to our Department. Her medical history was following.

Unilateral (right side) nasal obstruction was present for one month. On reception, patient was complaining of headache, nagging pain of the teeth in the maxilla of right side.

Paranasal sinuses were examined radiographically. Orthopantomograph (Figure 4) demonstrated well contrasting foreign-bodies unrelated with endodontical treatment of teeth of right side of the maxilla. From anamnesis it was emerged that patient was cramed peas into the nose cavity in childhood. Part of them was removed by otorhinolaryngologist still others got through semilunar hiatus (*hiatus semilunaris*) into the maxillary sinus. During the operation these calcified foreign-bodies were found in the sinus.

General anaesthesia with endotracheal intubation was applied in 25.5 percent of the cases of anaesthesies, while the combined anaesthesia was applied in 74.5 percent of the cases of anaesthesies. Combined treatment (surgical intervention and conservative treatment, which is directed at improving drainage from the maxillary sinus by widening the natural ostium of the sinus, general treatment includes antibacterial therapy, analgetics and hyposensitizing agents) was applied in 3.2 percent of the patients, while only conservative treatment was applied in 9.2 percent of the patients. Surgical and medicamental treatment was applied in 87.6 percent of the patients.

Surgical treatment

Radical maxillary sinus operation (by Caldwell-Luc), extractions of causal teeth were performed in the cases of chronic MS in our Department. Radical sinus operation and plastic closure of the fistula in the cases of chronic MS combined with a fistula into the maxillary sinus after teeth extractions were performed.

Operation according to Caldwell-Luc is shown in Figure 5.

Fistuloplasty (Figure 5, 6) is performed when inferior wall of the sinus is perforated.

Postoperative medicamental treatment includes antibacterial therapy: penicillin by 2000000 AU three times a day or zinacef by 750 mg two times a day, antifungal preparations – itraconazol by 10 mg two times a day for 3-

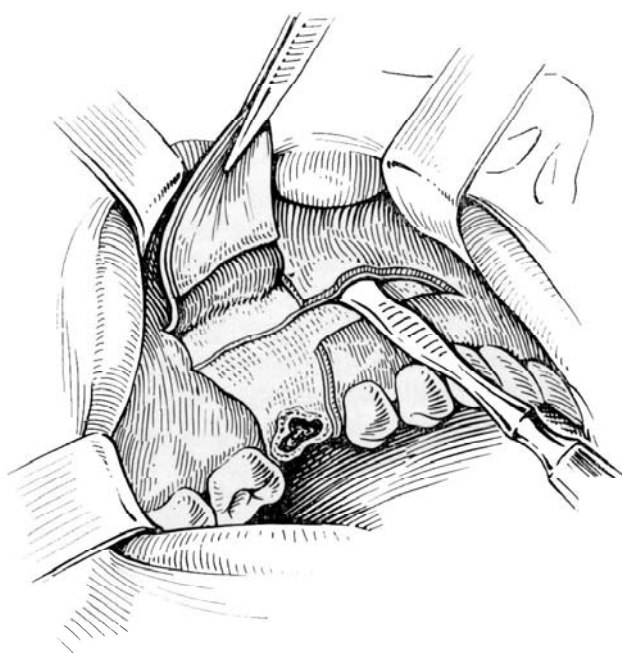


Fig. 6. Scheme of fistuloplasty (1).

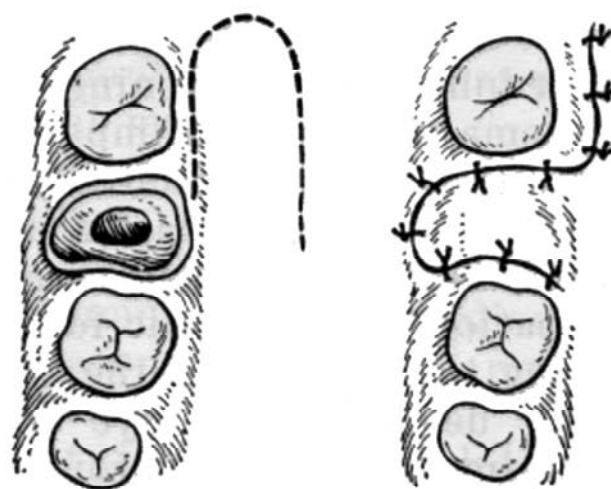


Fig. 7. Scheme of fistuloplasty (2).

4-5-6 months, one of the analgetics (ketanal, ketanov), hyposensitizing agents, mouth rinsing with antiseptic solutions.

DISCUSSION

Because of the incorrectly performed endodontic, surgical treatment maxillary sinus is infected, the inflammation of sinus develops. It is especially big problem while endodontic or surgical treatment of 2nd premolars, 6th and 7th molares is performed.

Chronic MS has been determined more for women than for man. Older women suffer from MS more frequently than men because of the undetermined reasons.

X-ray of paranasal sinuses (anteroposterior view) for the diagnosis of MS could not be made because of the low sensitivity and specificity. Computed tomography must be performed for diagnosis of MS.

Chronic MS combined with a fistula into the maxillary sinus after extraction of teeth occurs often enough (about 1/3 of the cases). It is very important to know anatomy of the maxillary sinus when surgical interventions in the maxillary sinus area are performed, thoroughly follow the instructions of teeth extraction.

The close proximity of the external posterior wall to the pterygopalatine fossa lodging the main trunk of the second division of the trigeminal nerve (the maxillary nerve), maxillary artery, and venous plexus connected with the orbit and cavernous sinus of the dura mater may pro-

mote the spread of pathology from the maxillary sinus to this region [6].

The superior wall of the maxillary sinus separates it from orbit. On the surface of the wall lies a canal (sometimes a semicanal) which opens into the maxillary cavity and contains the maxillary nerve and vessels. Therefore, pathological conditions of the sinus may affect this vascular – nerve bundle or spread into orbit.

Therefore, because of peculiarities of the topographic anatomy of the maxillary sinus it is necessary to examine, diagnose and treat the pathology of the maxillary sinus very thoroughly and closely.

CONCLUSIONS

1. It was performed, that females diagnosed and treated with chronic MS were 1.6 times more than males treated at the Department of Oral and Maxillofacial Surgery of Kaunas University of Medicine between 1999 and 2004.
2. Females treated for chronic MS were 4.5 years older than males.
3. Length of stay in Department of females and males was the same.
4. Age group of a 31-40 years old patients was the biggest one
5. Treatment of the chronic MS is chosen individually, understanding, that only the principles of the treatment can be a common.

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