



# ACUTE MASTOIDITIS - BEGINNING OF COVID-19 INFECTION - CASE REPORT

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**Keywords:** acute mastoiditis, SARS-COV-2

**Abstract:** Particular onset of Sars-Cov-2 infection, by acute mastoiditis without symptoms specific to the case definition. Mastoiditis is part of inflammatory diseases of the middle ear and is important because of its frequency and life-threatening complications due to the close relationship between the middle ear and the cranial cavity. An acute middle ear inflammation may follow a serious course even if the tympanic membrane does not perforate. In the pathogenesis of acute suppurations of the middle ear, the Eustachian tube plays a major role in the appearance of inflammation and the development of the disease. The most common germ can be - a virus whose initial effect is congestion of mucosa and reduce resistance to biological defence by promoting rapid superinfection with *Hemophilus Pneumococcus*, *Staphylococcus*, and others. Sars-Cov-2 infection begins with respiratory phenomena and clinical and biological inflammatory syndrome. This article presents a case of Sars-Cov-2 infection with atypical onset of acute mastoiditis. The clinical importance lies in the fact that the virus can migrate from the nose and nasopharynx through its Eustachian tube into the middle ear and from here to the mastoid. The presence of the virus in the middle ear is almost constant even if the patient is asymptomatic. This requires precautions in all surgical maneuvers at this level in patients with Sars-Cov-2 infection.

## INTRODUCTION

Mastoiditis is the most common complication of acute otitis. The mastoid osteitis process can develop exclusively, primitive or accompanying a severe septic condition, with minimal or invisible lesions in the eardrum, the so-called mastoid without otitis, a form rarely found today. In its pathogenesis being generally involved the vascular pathway, septicemia or posttraumatic.(1,2,3,4,5) In the vast majority of cases, the mastoid complicates an acute suppurative otitis media, so the correct name is otomastoiditis, the pathological process in the middle ear spreading from close to close to the mastoid.(1,2,3,4,5,6) Thus, the atico-tympanic lesions pass through aditus ad antrum to the mastoid cell group causing otomastoid suppuration. In any acute suppurative otitis media, the mastoid is also caught in the initial phase. This mastoid inflammation is clinically manifested by spontaneous pain or pain when pressing on the mastoid, in the central point. This clinical manifestation is called in practice the current mastoid reaction. The evolution depends on the virulence of the germs and the treatment applied, otomastoiditis being able to be stopped in evolution in the initial phase.(1,2,3,4,5)

The case definition for Acute Respiratory Syndrome with the new coronavirus (Covid-19) valid for August 2020, issued by the National Institute of Public Health in Romania is as follows: Suspicious case - any person with acute respiratory failure (sudden onset with at least one of the following symptoms: cough, fever, difficulty breathing) or any person with pneumonia, bronchopneumonia +/- pleurisy or any person with severe acute respiratory infection (fever or history of fever and

cough and difficulty breathing and requiring overnight hospitalization).(7)

The case definition of patients with SARS cov-2 infection does not take into account the specific symptoms for acute mastoiditis.

## CASE REPORT

A 59-year-old woman presented on 20.08.2020 in the Emergency Reception Service of the Sibiu County Emergency Clinical Hospital with complaints of intense constrictive headaches, no fever, cough, difficulty breathing, with onset a week ago. Neurological examination: no signs of meningeal irritation, orthostation and gait possible, cranial nerves in normal relations, negative paresis tests, no coordination disorders at the time of consultation, no pain charges, osteotendinous reflexes present, symmetrical, temporospatially oriented, conscious, cooperative, blood pressure within normal limits.

From the personal pathological antecedents we mention: hypertension, cholecystectomy, history of peritonitis, grade II obesity.

CT nr.71311 / 20.08.20: Moderately enlarged cerebral and cerebellar grooves, preserving the distinction between white and grey matter. Ventricular system positioned on the midline, symmetrical, normotensive, normally dimensioned. No acute intracranial blood density, no areas of focal or diffuse edema. Midline structures in normal position. Orbits, eyeballs without pathological changes. No clogged fracture trajectories in the skull cap. Minimum fluid collection left sphenoid compartment. Straight numerically reduced mastoid cells with a dense

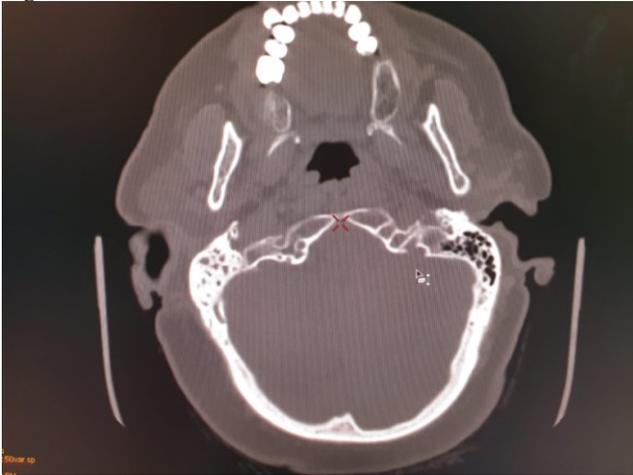
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collection that incompletely opacifies them. Conclusions: No acute intracranial pathology detectable CT at the time of examination. Right mastoiditis (figure no. 1).

**Figure no. 1. Cranial CT**



Blood tests performed in the Emergency Department within normal limits. Acute Inflammatory Syndrome: the presence of protein c (47,57mg/L), increased erythrocyte sedimentation rate (ESR- 51mm/h), Fibrinogen 471,4mg/dL.

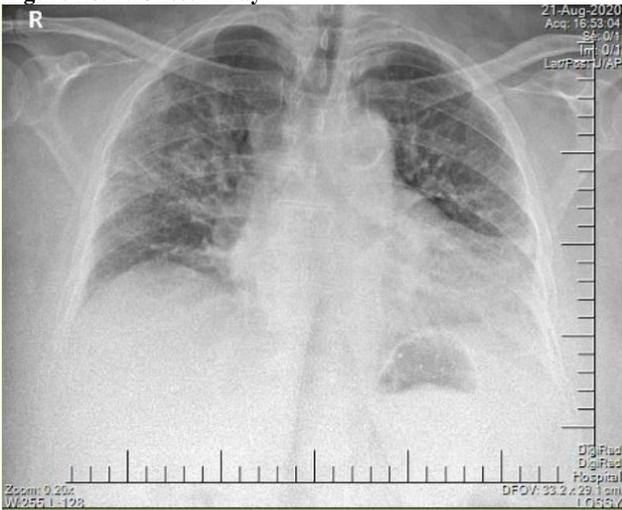
The patient is hospitalized in the EarsNoseThroat department - tampon salon.

The ENT consultation reveals: uncharacteristic facies, lips and tongue of normal appearance, discrete congestive pharynx, eardrum as slightly congestive, mastoid as sensitive to palpation.

Treatment with a broad-spectrum antibiotic is instituted. At 24 hours after admission, the patient is tested positive for Covid-19.

Lungs radiograph reveals cord with elongation of the lower left arch and small bilateral latero-thoracic congestive processes (figure no. 2).

**Figure no. 2. Chest X-ray**



The Infectious Diseases Consultation decides the transfer to the Infectious Diseases Department with the diagnosis of acute viral pneumonia and acute mastoiditis. Objective examination at admission: good general condition, normoponderal, uncharacteristic facies, normally colored skin, sabural tongue, normally colored mucous membranes, well-represented connective-adipose tissue, superficial ganglion system, impalpable, normotonic and normokinetic muscular

system, apparently intact and mobile osteoarticular system, normally conformed thorax, lung sound, physiological vesicular murmur, no rallies, rhythmic heartbeats, well beaten, heart rate-90bpm, blood pressure 110/80 mmHg, apex shock present in the 5-th intercostal space on the left median heart line, bilateral peripheral pulse present, depressed abdomen, mobile with breathing, painless spontaneously and on palpation, intestinal transit present, palpable liver at the costal rim, non-palpable spleen, supple renal lodges, bilateral Giordani (-), spontaneous physiological urination, temporospatially oriented, osteotendinous reflexes present bilaterally, without signs of meningeal irritation.

PCR tests from nasopharyngeal secretion: sample 1,2 and 3- positive, sample 4- negative, sample 5- inconclusive, sample 6 and 7- negative.

The evolution was favourable under hygienic-dietary, antiviral, immunomodulatory, broad-spectrum antibiotic, anticoagulant, bronchodilator, hepatoprotective, antitussive and anti-inflammatory treatment.

## DISCUSSIONS

In Sars cov2 infection, the virus is constantly present in the nose and nasopharynx. From here, the virus can migrate to the middle ear through the Eustachian tube. The Eustachian tube behaves as a way of spreading the infection from the nasopharynx to the middle and mastoid ear, the infection causing a congestion of the mucosa. Against the background of this local congestion, microbial germs have all the conditions for development. At the same time, the inflammation of the mucosa leads to a depression in the middle ear that reverses the normal drainage from the ear to the nasopharynx, favoring rapid bacterial superinfection.(2)

Mastoiditis is an inflammatory process of the mastoid air cells in the temporal bone. In most cases the symptoms associated with the middle ear (fever, pain, driving deafness) predominate, and mastoid cell disease is not considered a separate entity.(1,2,5)

A group of researchers from the Johns Hopkins Department of Otolaryngology-Head and Neck Surgery demonstrated in an article published in JAMA Otolaryngology-Head & Neck Surgery that SARS-CoV-2 can access the middle and mastoid ear. They also stated that for many years that viruses, including other coronaviruses, have been isolated from the middle ear space in children with acute otitis media and in children undergoing tympanostomy tube placement for chronic otitis media with effusion; but until now, it was unclear if SARS-CoV-2 reached the middle ear space and whether it could be isolated from the middle ear.(8,9,10)

The predilection of the corona virus in the upper airways, nose, nasopharynx, has led to the extension of the infection in the nasopharynx via the Eustachian tube, to the middle ear seems to be quite easy and it seems that the virus is also found in this level quite frequently.

## CONCLUSIONS

The peculiarities of the case lie in the onset of intense headache syndrome, without fever and respiratory symptoms, which raises the suspicion of a neurological condition, which was refuted by neurological examination and CT.

Given the anatomical relationships of the nasopharynx and the middle and mastoid ear, the presence of the virus at this level can be revealed in several cases - even if clinically there are no specific symptoms.

The presence of the virus at this level requires caution in all surgical maneuvers performed on the middle ear or mastoid. These maneuvers are aerosol generating, as such protective equipment specific to aerosol generating maneuvers

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must be used.

From a clinical point of view in Sars cov-2 infection, the symptoms in the field of otorhinolaryngology are attenuated compared to the pulmonary symptoms in general.

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