CASE REPORT

Subdural empyema, retropharyngeal and parapharyngeal space abscess: unusual complications of chronic otitis media

Subduralni empijem, retrofaringealni i parafaringealni apsces: retke komplikacije hroničnog zapaljenja srednjeg uha

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Abstract

Introduction. Otitic complications arise from expansion of the middle ear infection. Subdural empyema is a rare otitic complication, and both retropharyngeal and parapharyngeal abscesses have been described in just a few cases. Case report. A 30-year-old male was admitted as an emergency case because of breathing difficulties, secretion from the ear, and fever. Clinical examination had shown a purulent, fetid secretion from the ear, swelling on the roof of epipharynx, left tonsil pushed medialy, immobile epiglottis, reduced breathing space. Computed tomography revealed thick hypodense content filling cavity, mastoid entering the posterior cranial fossa, descending through the parapharyngeal space to the mesopharynx. On the roof and posterior wall of the epipharynx hypodense collection was also present. Tracheotomy was conducted, and incision of the parapharyngeal and retropharyngeal abscess and radical tympanomastoidectomy were performed. The patient’s state deteriorated on the tenth postoperative day with hemiparesis and consciousness disorder. Magnetic resonance imaging was done. It showed subdural empyema of the left frontoparietal region and next to the falx, so craniotomy and abscess drainage were conducted. Conclusion. Parapharyngeal, retropharyngeal abscess and subdural empyema are rare otitic complications. Adequate antibiotic therapy and radical surgical treatment make possible an outcome with survival.

Key words: empyema, subdural; retropharyngeal abscess; otitis media; treatment outcome.


Ključne reči: empijem, subduralni; apsces, retrofaringealni; otitis medija; lečenje, ishod.

Introduction

Otitic complications arise from spreading of infection of middle ear, usually with chronic inflammation with cholesteatoma. With the advent of antibiotics the number of otitic complications has been significantly reduced, but it still poses a problem and needs early detection and adequate treatment. The incidence is 0 : 24 to 0 : 45, and in the preantibiotic era it was 6%. Mortality is 18%–31%, and before the discovery of antibiotics it was 76% 1–3.
The most common extracranial complications are facial palsy, subperiosteal abscess and labyrinthitis and intracranial: meningitis, cerebral abscess and sigmoid sinus thrombosis. Causes of infections are Gram-negative bacteria, but anaerobes also have to be taken into account. Common symptoms are fever, such is headache with secretion from the ear.

Computed tomography (CT) and magnetic resonance imaging (MRI) make diagnostic procedure much faster and more accurate. The sensitivity of CT for intracranial otitic complications is 92.75%, and diagnostic method of choice for intracranial focal infection is MRI 4.

Antibiotic therapy (combination of the third- or fourth-generation cephalosporin, aminoglycosides and metronidazole) provides good results. Surgical intervention involves mastoidectomy or radical tympanomastoidectomy. In focal intracranial infections craniotomy and abscess drainage are preferred.

The death rate decreases by using CT and MRI because of faster and more accurate diagnosis, timely surgical intervention and appropriate antibiotic therapy. Postsurgical morbidity due to intracranial infection includes hearing loss, hemiparesis, hydrocephalus, mental retardation, neuropathy, and epilepsy 4-6.

Multiple ototic complications occur in 25% of extracranial and 44% of intracranial complications  1. Subdural empyema is a rare otitic complication represented by purulent collection between the dura and arachnoidea. It has been presented in 15%–22% of intracranial focal infections. It usually occurs as a complication of rhinosinus infections, meningitis and injuries. Infection from the ear spreads directly or venously 7, 8. Retropharyngeal and parapharyngeal abscesses, as ototic complications, are described in a few cases 9, 10.

We reported a patient with multiple complications of chronic otitis media with cholesteatoma: subperiostal abscess, thrombosis of the sigmoid sinus and internal jugular vein, perisinus abscess, parapharyngeal and retropharyngeal abscess, supraglottitis, and subdural abscess.

**Case report**

A 30-years-old male, was admitted as an emergency because of choking, difficulties with swallowing, secretions from the ear, swelling behind the ear and fever. Preveously, in his tenth year, tympanoplasty had been done. On clinical examination we found a purulent, fetid secretion from the left ear, retroauricular edema which fluctuates, swelling on the roof of epipharynx, left tonsil pushed medialy, swelling of the left lateral hypopharyngeal wall down to sinus piriiformis, immobile epiglottis, mucosa of the supraglottis hyperemic and edematous, reduced breathing space. The patient had a high fever and breathing with inspiratory stridor. C-reactive protein level was 210 mg/dL, white blood cells (WBC) 13 × 10^9/L.

CT of the endocranium and neck revealed thick hypodense content filling cavity, mastoid, entering the posterior cranial fossa, descending down through the parapharyngeal space to the mesopharynx. After injecting contrast CT revealed defect in the sinus sigmoideus, partially represented with gas, that spreads through the jugular foramen in hypodense tubular structure. Hypodense collection with gas content, 22 × 16 mm in diameter, descended down through the parapharyngeal space to the mesopharynx is shown in Figures 1 and 2. On the roof and posterior wall of the epipharynx hypodense collection 24 × 18 mm in diameter was observed (Figure 3). There was subdural pneumocephalus next to the falx and in the frontal region. In the region of the cerebellum no postcontrast changes in density were present. Supratentorial structures without changes in density were described.

![Fig. 1 – Computed tomography (CT) reveals hypodense collection with gas content subcutaneously in the left temporoparietal region, filling the mastoid cavity and entering into the sinus sigmoideus and posterior cranial fossa](image1)

![Fig. 2 – Computed tomography (CT) reveals parapharyngeal inflammatory collection with gas content in a direct contact with the internal jugular vein filled with hypodense content and gas](image2)

Antibiotic therapy including ceftriaxon, amikacin and metronidazole, as well as anticoagulation therapy, had been instituted. Tracheotomy had been conducted, incision of the parapharyngeal and retropharyngeal abscess and radical tympanomastoidectomy with denudation of the dura mater. Proteus vulgaris was isolated, and the presence of gas suggested anaerobic infection.

Postoperatively, the patient recovered without fever, WBC count was $9.1 \times 10^9$/L, C-reactive protein 29 mg/dL, without swelling and secretions in the pharynx and larynx.

The patient's state deteriorated on the tenth postoperative day with hemiparesis, WBC $8 \times 10^9$/L, C-reactive protein 61 mg/dL. CT revealed supratentorial, frontoparietal left subdural effusion with free gas, without moving medio-sagittal structures. Because of the suspected hygroma neurosurgical intervention was not indicated. Antiedematous, along with antibiotic therapy was instituted. Because of further deterioration with consciousness disorder and signs of pyramidal lesions on the right, MRI was done. It showed subdural empyema of the left frontoparietal region and next to the falx, chamber system dislocated towards the right along with cerebelar falx (Figures 4 and 5). Infratentorial, nor intrapinially, no visible pathological changes were detected. The patient underwent craniotomy with wide excision of the dura mater and abscess drainage. The patient experienced postoperative improvement of consciousness level and general condition. Repeated CT scan did not show signs of any residual collection. The patient had been decanullated and retroauricular fistula was resutured. Control CT, after a month, showed regular findings, so the patient was discharged from the Clinic without neurological deficiency.

Discussion

Otitic complications are still relatively common, despite the discovery of antibiotics and the possibility of early diagnostic through the use of CT and MRI. The mortality rate is still alarmingly high (18%–31%) and higher in undeveloped countries. Two or more complications of purulent otitis media are often associated, 25% of extracranial and 44% of intracranial otitic complications.

The case we presented with eight otitic complications is extremely rare. Because of chronic psychosis communication with the patient was difficult. Lack of history data has caused the development of the disease without adequate treatment. He was admitted in a bad general condition with signs of sepsis. The extent of complications was probably a consequence of sigmoid sinus thrombosis, combined aerobic and anaerobic infection and untimely treatment. The infection had venous and direct spread from the mastoid region to the posterior fossa and below the base of the skull to the retropharyngeal space. A large amount of gas suggested anaerobic flora.

Only a few cases of parapharyngeal abscess have been described, explaining the spread of infection via the internal jugular vein or directly through the mastoid tip and deep muscles of the neck. Retropharyngeal abscess, as a result of acute otitis media, is described together with cervical vertebral osteomyelitis through direct spread down the skull base.9,10

Subdural empyema is a rare otitic complication, more often it is a complication of rhinosinus infections, meningitis and injuries.

Infection from the ear spreads directly or through the vein. Subdural empyema in the presented patient developed by hematogenous spread of infection. Initial lesion was in the frontoparietal region on the same side. Small subdural effusion, shown on CT scan, represented a differential diagnostic problem between empyema and hygroma (in case of which surgery is contraindicated). MRI is the method of choice in the diagnosis of intracranial infections. Craniotomy and wide excision of the dura mater and abscess drainage give the best results.7,8

Conclusion

Multiple otitic complications (subperiostal abscess, parapharyngeal abscess, retropharyngeal abscess, supraglottitis, thrombosis of the sigmoid sinus and internal jugular veins, perisinus abscess and subdural empyema) are rare, and the reason for its development is untimely treatment caused by underlying disease. Adequate antibiotic therapy and radical surgical treatment enable the outcome with survival.

References


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