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Case Report

Unilateral sigmoid sinus thrombosis and otitis media in a paediatric patient

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ABSTRACT

The aim of this study is to present the symptoms, diagnosis, and management of unilateral sigmoid sinus thrombosis (SST) in a pediatric patient with acute otitis media, as well as to propose recommendations for its diagnosis and treatment. An 11-year-old girl was referred to our clinic with persistent high fever, headache, and otalgia. She had previously been treated with local and oral antibiotics. A comprehensive evaluation revealed otitis media, mastoiditis, and SST in the right ear. Blood tests, along with imaging studies including a CT scan and contrast-enhanced MRI were performed for confirmation. The patient was treated with broad-spectrum antibiotics, anticoagulation therapy, and ventilation tube insertion, leading to a favourable clinical, laboratory, and imaging outcome. She was discharged home after seven days. Based on our experience, the combination of broad-spectrum antibiotics, anticoagulation therapy, and a conservative surgical approach can result in a positive prognosis for pediatric patients with SST as a complication of otitis media.

Keywords: Sigmoid sinus thrombosis, Otitis media, Paediatric, Mastoiditis

INTRODUCTION

Cerebral sinus venous thrombosis (CSVT) is a rare form of venous thromboembolism (VTE).[1]

CSVT represents almost 0.5%-3% of all the types of strokes, affecting predominantly younger people, with an estimated incidence for adults of 3-4 per million, and for children 7 per million.[2-4] CSVT is a multifactorial condition with sex-related specific causes.[1]

Cerebral venous sinus (sinovenous) thrombosis (CSVT) in childhood is a rare, but under recognized, disorder, typically of multifactorial aetiology, with neurologic sequelae apparent in up to 40% of survivors and mortality approaching 10%.[5]

Otogenic SST is a rare complication of AOM with possible serious consequences.[6]

Therefore, we present the clinical case of an 11-year-old girl with unilateral SST as a complication of ipsilateral otitis media.

CASE REPORT

An eleven-year-old girl was presented to our department with high fever (up to 41^0C) for the last 9 days, headache and current otalgia.

A month previously she was treated with local and oral antibiotics for a right ear infection from the patient's paediatrician. After a short remission, she started having a persistent headache that was not improved with analgesics, followed by a high fever.

The patient was referred to our tertiary centre from a non-public unit hospital because her magnetic resonance

imaging (MRI) revealed right mastoiditis and thrombus in the right sigmoid sinus (Figure 1).

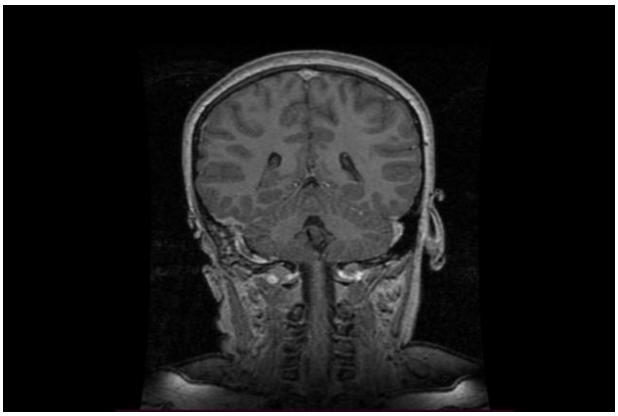

Figure 1: Magnetic resonance with contrast enhancement (T1W coronal) of the brain and brainstem that indicates partial void defect and signal alteration.

On physical examination, the patient appeared tired but not in distress. Her vital signs were within relatively normal limits aside from the body temperature (Heart rate: 114/min, Blood pressure: 90/50 mmHg, Temperature: 38.8^0C, O_2 sat: 99%). The tympanic membranes were erythematous on both sides and the right tympanic membrane was bulging. Her oropharynx was normal. Griesinger sign was negative bilaterally. Her score on the Glasgow coma scale (GCS) was 15/15 and there were no signs of meningeal irritation.

Initial workup included lab tests (complete blood count, comprehensive metabolic panel, CRP) which showed WBC of 15000/mm^3 and CRP value of 22.61 mg/dl (normal range:<0.5). Comprehensive metabolic panel values were within the normal range. A head CT without contrast enhancement was performed with 2.5/0.6 mm slice thickness and with reconstruction for temporal bone that concluded with right mastoiditis (Figure 2).

Figure 2: Head CT scan without contrast enhancement of loss of pneumatisation in right mastoid.

Intravenous antibiotic therapy was commenced with ceftriaxone (50 mg/kg/day), vancomycin (10 mg/kg/dose) and metronidazole (30 mg/kg/day). Patient was consulted with a neuropediatrician who added to the therapy nadroparin 0.4 ml once daily administered subcutaneously. Additionally, ophthalmology performed a fundoscopy that showed no fundus or optic nerve oedema or haemorrhage.

After two days on medication, our patient displayed improvement both clinically and in laboratory values. She had longer episodes without fever and leucocytosis dropped to 13700/mm^3 and a CRP value to 11.51 mg/dl (normal range:<0.5).

Subsequently, the patient underwent a tympanostomy procedure with ventilation tube insertion in the right ear under general anaesthesia.

After seven days the patient was discharged because of the remarkable improvement both clinically and in laboratory results.

The patient returned for the follow up 3 months afterwards and the control MRI with contrast enhancement showed no thrombus presence in the right sigmoid sinus (Figure 3).

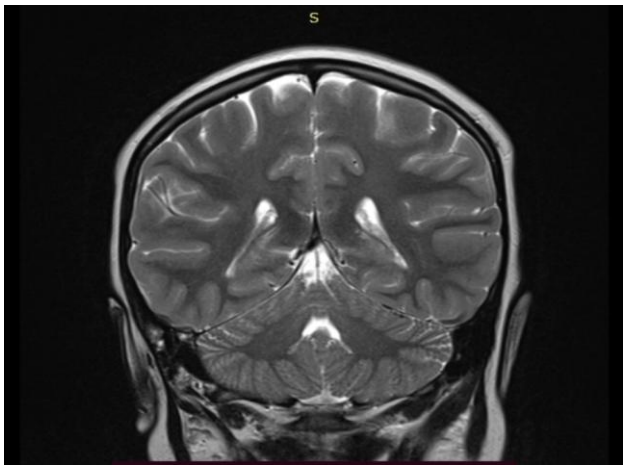

Figure 3: Magnetic resonance with contrast enhancement (T2W coronal) of the brain and brainstem 3-months follow up demonstrates complete recanalization of the right sigmoid sinus.

DISCUSSION

The diagnosis of SST requires a high index of clinical suspicion as the signs and symptoms can be variable and in many cases are vague or non-specific. Children usually present with a constellation of symptoms like fever, otalgia, headache, vomiting, and depressed mental status.[5,7,8]

Often enough severe headache is the most common presenting symptom even in the absence of typical

otomastoid complaints, such as otorrhea, or postauricular pain and swelling.[19,20]

As the condition progresses, increased intracranial pressure (ICP) can be manifested through cranial nerve palsies, papilledema, altered mental status, and can even lead to seizures, stupor, and coma, although this was not the case in our patient.[5,7,8] In many cases the use of prolonged antibiotic treatment could mask or modify somehow the clinical presentation.

Radiologic investigation is essential for diagnosing LST (Lateral sinus thrombosis). Computed tomography with contrast enhancement is needed in all cases in order to demonstrate the pathologic abnormality of the mastoid and cranial cavity. MRI is more sensitive in detecting LST especially when MRA/venography is performed.[9-14]

The CT scan and MRI performed in our patient; both demonstrated the extension of the ear infection in the respective mastoid.

In absence of Griesinger sign clinically, we could conclude that a CT head scan without contrast, may fail to identify SST as in our patient.[13] If there is a clinical suspicion of the aforementioned diagnosis, MRI of temporal bone should be requested.

Prompt management of our case consisted in analgesics, antipyretics, rehydration, parenteral antibiotics and anticoagulation followed by a tympanostomy with ventilation tube insertion in the right ear.

The role of anticoagulants in septic otogenic SST remains ambiguous.[19] However anticoagulants do not show adverse effects if they are administered correctly and if the anticoagulation therapy is monitored in short-term intervals according to a retrospective review done in Graz.[17]

This therapeutic approach was sufficient in our case, the patient improved significantly after semi- conservative treatment and was later on discharged home. Indeed, Scorpecci et al suggests that mastoidectomy should no longer be indicated in cases where LST is associated with a non-erosive mastoiditis.[21]

In other cases, a more aggressive surgical approach is required. Patients who were treated conservatively or with simple mastoidectomy demonstrated recanalization of the intracranial sinuses and the internal jugular vein after 3 months as in our patient. These results demonstrate that thrombectomy and ligation of the internal jugular vein show no beneficial effect in the therapy for LST.[17]

CONCLUSION

Ultimately, clinical suspicion in conjunction with appropriate imaging is of highly importance for differentiating SST immediately and initiating the therapy rapidly. In the treatment of unilateral SST, we followed a conservative approach (antibiotic therapy, myringotomy, placement of ventilation tube and anticoagulation) with good outcome. However, more investigation is needed to determine the variables that predict the prognosis of SST and the most appropriate therapeutic approach.

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