Lateral Sinus Thrombosis

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SUMMARY

We describe four cases of lateral sinus thrombosis secondary to otitis media. They presented with low-grade fever, headache, nausea, vomiting and ear discharge. One patient had facial nerve palsy. CT scan was helpful in managing these patients. They were treated with antibiotics followed by surgery. Two patients had intracranial abscesses and were treated accordingly.

KEY WORDS:
Lateral sinus thrombosis(LST), CT scan, Antibiotics, Surgical management

INTRODUCTION

Complications from the middle ear infections have become rare since the introduction of antibiotics. Nevertheless intracranial complications such as lateral sinus thrombosis, meningitis and brain abscesses are life threatening and need early recognition. Antibiotic treatments often modify the classical picture of these intracranial complications. One such condition is lateral sinus thrombosis. In a review from January 1998 to November 2002 in HUKM, there were four cases of lateral sinus thrombosis. We present the case reports and review their clinical presentations, management and outcome.

CASE 1

An 11 year-old boy presented with history of severe persistent throbbing headache over the right mastoid associated with vomiting and low grade fever for three days. He has had a chronic recurrent ear discharge for two years that became profuse over the last three days. There was no vertigo. Right ear examination showed profuse foul smelling discharge. CT scan demonstrated a filling defect with enhancing rim in the right jugular fossa suggestive of thrombosed right sigmoid sinus. The right mastoid air cells were opacified.

Intravenous Augmentin was started. Emergency right modified radical mastoidectomy revealed cholesteatoma at the attic and antrum with granulation tissues and pus in the mastoid cavity till the sigmoid sinus. The diseased mastoid air cells and the cholesteatoma were removed. The thrombosed sigmoid sinus was opened and a thrombus removed. The sigmoid sinus was covered with surgecel. The cavity was packed with Bismuth Iodoform Paraffin Paste(BIPP). The patient improved after two days.

CASE 2

An eight year-old boy (spastic quadriplegic cerebral palsy and cortical blindness) presented with bilateral ear discharge and low-grade fever for ten days associated with nausea and vomiting. A right postauricular swelling was noted three days before admission. The right ear examination showed stenotic external auditory canal (EAC) filled with granulation tissues and mucopurulent discharge. CT scan revealed opacities in both mastoid cavities. Right lateral sinus showed non-enhancing centre. Emergency right mastoid exploration revealed subperiosteal abcess, mastoid abscess and a thrombosed sigmoid sinus. The sigmoid sinus was opened and a thrombus removed. Intravenous Augmentin was continued for two weeks. He improved and discharged home.

CASE 3

A 35 year-old man presented with left ear discharge and pain of one-week duration associated with left-sided temporal headache, reduced hearing, high-grade fever and left lower motor facial palsy. On admission, he was conscious, febrile (39°C) with a facial nerve palsy (grade 4 House Brackman) and neck stiffness. The left EAC was oedematous filled with pus. CT scan revealed soft tissues filled sclerotic left mastoid. No intracranial lesion was noted.

Intravenous Metronidazole and Ceftriazone were started. Emergency mastoid exploration revealed granulation tissues within the middle ear, pus in the antrum, tegmen antri and perisinus area. The facial nerve at the turn of second genu was dehiscent and oedematous. Posterior cranial fossa dura was exposed. The sigmoid sinus was firm on palpation. It was opened and a thrombus removed. One day post-operatively, he developed a right hemiparesis. Urgent CT scan revealed a subdural abscess. A left craniotomy was performed to drain the abscess. He recovered slowly over a period of one month. His facial nerve function improved to grade 2.

CASE 4

A 24 year-old man presented with right ear mucopurulent blood-stained discharge associated with pain, tinnitus and reduced hearing for one month. One week before admission he had vertigo, headache, low-grade fever, nausea and vomiting. There were granulation tissues and pus in the right EAC. Neck stiffness was present. CT scan revealed soft tissue mass in the middle ear and mastoid cavity. Right sigmoid sinus was opacified. Intravenous Ceftriazone, Metronidazole and Gentamicin were started followed by emergency right

This article was accepted: 09 May 2007
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modified radical mastoidectomy. The right mastoid cavity was contracted and the middle ear was filled with granulation tissue. The tegmen was breached with pus oozing from the sinodural angle.

The thrombus in the sigmoid sinus removed. The exposed dura was covered with temporalis fascia. However, the fever, headache and blurred vision persisted. A repeat CT scan revealed a right temporal lobe abscess. A burr hole was performed to drain the pus. He improved and discharged after three weeks.

DISCUSSION

Lateral sinus thrombosis (LST) accounts for approximately 20% of intracranial complication following suppurative otitis media[1]. LST predominantly occurs in males[2, 3] and peaks in the first and second decade of life. Southwick *et al* (1986) found that approximately 49% of the thrombosis occurred with acute infections and 51% with chronic ear disease[2]. It is thought that LST occurs by direct extension or by thrombophlebotic spread through small emissary veins. Progressive expansion of the mural thrombus may eventually occlude its lumen. The clot may partly organized and partly broken down and softened by suppuration. A thrombus can extend to sagittal sinus, cavernous sinus, internal jugular vein and subclavian veins[3]. Concomitant treatment with antibiotics has altered the clinical presentations. The classical spiking temperature 'picket- fence pattern' does not occur instead patient may present with intermittent low-grade fever.

In the pre-antibiotic era, extension of LST may cause other signs which include pain and tenderness along the anterior border of stenocleidomastoid muscle. Perivenous inflammations around the jugular foramen occasionally cause paralysis of the lower (IX, X, XI) cranial nerves[3] (Vernet's syndrome). Impaired venous drainage and cerebrospinal fluid resorption cause raised intracranial pressure with hydrocephalus. Mastoid emissary veins thrombosis leads to pitting oedema over the occiput (Griesinger's sign).

LST is closely associated with other intracranial complications (42%) e.g. meningitis, brain abscess, subdural empyema, extradural empyema and cavernous sinus thrombosis[1]. CT scan shows increased density of fresh clot and filling defect within the sinus. Septic thrombosis appears as intense inflammatory enhancement of the sinus walls and dura with non-enhancement of the lumen constituting the empty triangle or the delta sign. MRI should be performed when CT scan is non-diagnostic. Thrombosed dural sinuses exhibit high intensity signal on T1 and T2 weighted images.

Treatment of lateral sinus thrombosis is based on control of infection by surgical debridement and intense antibiotic therapy. Intravenous antibiotic should be started early to minimize haematogenous spread. Following mastoidectomy, dural granulations are removed and sinus wall inspected. A normal appearing, compressible sinus wall requires no further surgical treatment. A dry tap with small gauge needle suggests thrombosis, and aspiration of pus indicates infected thrombus. An incision is made on the lateral sinus wall in the direction of the vessel and the clots are removed until there is free bleeding from both ends. The sinus may then be covered with absorbable sponges or temporalis muscle and the mastoid cavity is packed with BIPP. Bradley *et al* recommended anticoagulation therapy in selected patients with serial imaging to detect thrombus propagation. The duration ranged from 1 to 6 months in their series[4].

REFERENCES

1. Singh B. the management of lateral sinus thrombosis. The Journal of Laryngology and Otology 1993; 107: 803-808.
2. Syms MJ, Tsai PD, Holtel MR. Management of lateral sinus thrombosis. Laryngoscope 1999; 109: 1616-20.
3. Surkin MI, Kessler RP, Green Fe, Lucente. Subclavian vein thrombosis secondary to chronic otitis media: a case report. Ann. Otol. Rhinol. Laryngol. 1983; 92: 45-48.
4. Bradley DT, Hashisaki GT, Mason JC. Otogenic sigmoid sinus thrombosis: What is the role of anticoagulation? Laryngoscope 2002; 112: 1726-29.