International Journal of Basic and Applied Chemical Sciences ISSN: 2277-2073 (Online)
An Online International Journal Available at http://www.cibtech.org/jcs.htm
2013 Vol. 3 (2) April-June, pp.6-9/Pandey et al.
Case Report

OTOGENIC LATERAL SINUS THROMBOSIS: CHANGING TRENDS IN ITS PRESENTATION - A CASE REPORT

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ABSTRACT
Lateral sinus thrombosis (LST) is nowadays a rare but fearsome complication of middle ear infection. The incidence of LST has decreased significantly since past due to introduction of broad spectrum antibiotics and advanced imaging techniques. Nevertheless, its presentation is often clouded with non-specific and varied clinical characteristics. A prompt and concerted approach involves good clinical assessment, appropriate neuro-imaging and early institution of intravenous antibiotics for better outcomes.

Key Words: *Lateral Sinus Thrombosis (LST), Chronic Otitis Media, Mastoiditis, Internal Jugular Vein (IJV), Magnetic Resonace Venography (MRV)*

INTRODUCTION

The incidence of intracranial complications of middle ear infection as well as associated mortality rates have dropped dramatically due to availability of good antibiotics, development in surgical techniques and better neuro-imaging facilities. LST still results in mortality and morbidity of 10% and 30%, respectively (Bianchini *et al*., 2008). The classic presentation of LST comprising of 'Picket –fence fever', headache and otitis media is nowadays exceptionally rare (Christensen *et al*., 2009). The contributing factors for its altered clinical presentation are extensive use of antibiotics, emerging resistant strains (Luntz *et al*.,2001), change in bacteriology (Seid *et al*.,1973), early diagnosis due to available neuroimaging facility (Damak *et al*., 2009) and shifting of nature of otogenic disease from acute to chronic otitis (Christensen *et al*.,2009) . This case report aims to reveal its variable presentation with emphasizing the importance of neuroimaging for timely diagnosis.

CASES

A twenty five year old pregnant female (28 weeks) came to ENT out- patient department with chief complaints of right otalgia and discharge since 3 months, cough with sputum since last 2-3 months, recurrent colds since last 2-3 months, and headache, neck pain and on and off fever since 20 days. Right otalgia was severe in intensity, radiating to head and eye and partially relieved by medications. The ear discharge was moderate in amount and blood stained with foul smell. On examination, there was right postauricular scar present and otoscopy revealed granulations with foul smelling discharge. Nasal examination revealed mucopurulent discharge in right nasal cavity with inferior turbinate enlargement. On neck examination, there was a right sided thick cord like feel and tenderness along anterior border of sternocleidomastoid. There was also difficulty in neck movements. A probable diagnosis of right unsafe CSOM with IJV thrombosis and subacute rhinosinusitis was made. Broad spectrum antibiotics (Piperacillin with Tazobactum) and anticoagulation (subcutaneous heparin) were instituted. MR venogram showed evidence of thrombosis of right transverse, sigmoid sinus and right internal jugular vein (Figure 1).

MR findings also revealed right mastoiditis with? cholesteatoma with thick pus/granulation tissue leading to expansion and erosion of mastoid . Chest x-ray showed right upper zone cavitating pneumonia and MRI done for neck and upper thorax revealed bilateral thick walled cavities in upper zones of lung. Based on history of chest complaints and radiological findings ATT was started empirically. Blood counts

revealed:— Hb- 7.8 gm%, ESR- 17mm/ist hr, PBS- microcytic hypochromic anemia, TLC-10800/mm3, DLC- N84,L15,M1 .

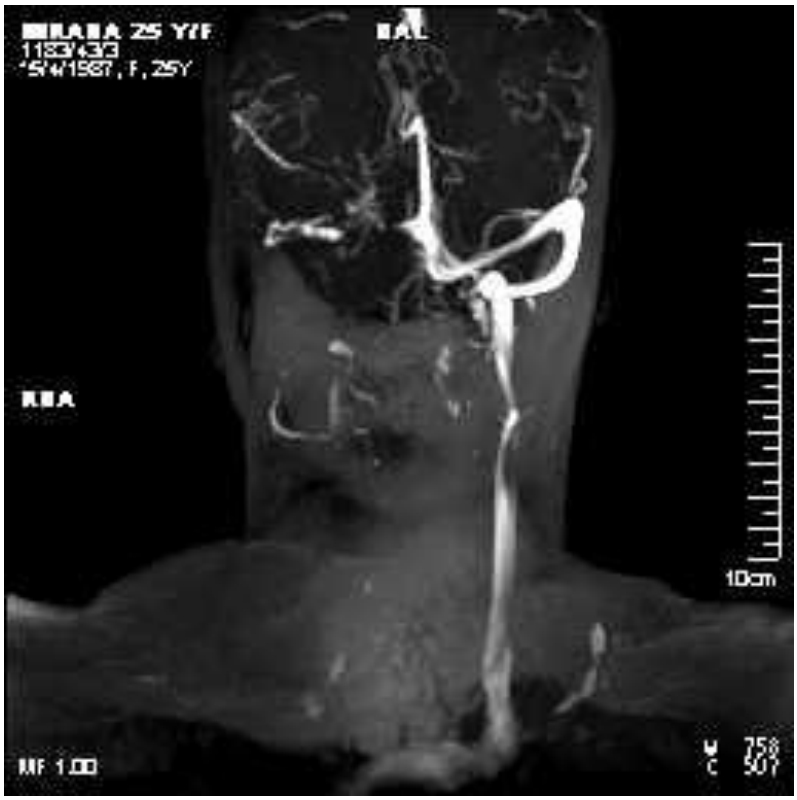

Figure1: MR venogram showing thrombosis of right transverse and sigmoid sinus and right Internal jugular vein.

Regular obstetric consultation and care was also sought and ultrasonography of abdomen revealed single live fetus with markedly reduced liquor and appropriate treatment was started. Ophthalmic examination revealed refractive errors in both eyes; fundus was bilateral normal, digital intra-ocular pressure was normal bilaterally. On Corneal examination, dendritic pattern of corneal epithelial defect (stained by Fluourescein 2% dye) with associated keratoconjunctivitis in left eye was seen pointing to probable diagnosis of Herpetic kerato-conjunctivitis in left eye. Acyclovir eye ointment and tear drops were given. A final diagnosis of right unsafe CSOM, sub-acute rhinosinusitis, right IJV and sigmoid sinus thrombosis, pulmonary tuberculosis with viral conjunctivitis in a 7 month pregnant lady was made. Patient responded well to the aggressive medical treatment showing improvement in neck tenderness, otalgia, headache and overall general condition as well. She was advised mastoid exploration but she refused due to financial constraints and pregnancy. She delievered a live baby after two months.

DISCUSSION

The close anatomic position of middle ear cleft to the dural venous sinuses might act as a predisposing factor for LST. It occurs secondary to any acute or chronic infectious inflammatory condition of middle ear cleft. Thrombus formation in the lateral sinus starts to form with mastoid bone erosion caused by cholesteatoma, granulation tissue, or coalescing mastoid air cells, eventually forming a perisinus abscess

which acts as a persistent source of inflammation (Bradley *et al*., 2002).LST may take another pathogenic mechanism to evolve in acute otitis by an osteothrombophlebitic phenomenon (Kaplan *et al*., 1999).

Recent trends reveal that bacteriology of LST has changed from beta-hemolytic streptococci to mixed origin (Lee *et al*., 2009). This changing trend presumably lies with the fact that this disease now emanates more commonly after chronic infection rather than acute suppurative infection (Seid *et al*., 1973). It has been reported that LST secondary to chronic otitis media yielded anaerobic organism in 100% and Proteus Spp in 66% of cases (Syms *et al*., 1999). However cultures from blood, ear discharge or postsurgical mastoid collection might be non-productive (Kaplan *et al*., 1999)**.**

The spectrum of clinical features is wide and variable. Headache is said to be most common symptom, particularly in paediatric population (Bales *et al*., 2009). It is advisable to suspect LST in a patient having otomastoiditis with atypical features and secondary headache of unknown etiology (Santos *et al*., 2012). A different pattern is reported in developed countries with good antibiotic availability where neurologic complaints are more prominently featured than otologic complaints, particularly in pediatric population (Bales *et al*., 2009). Otalgia, nausea, vomiting, diplopia, impaired visual acuity, and high spiking fever are usual complaints in cases, who have not received antibiotics yet, whereas headache, otalgia and photophobia are preferentially seen in cases receiving antibiotics (Syms *et al*., 1999). Other symptoms and signs may include otorrhoea, dizziness, hearing loss due to chronic otitis, mild fever (Kutluhan *et al*.,2004) ; painful neck, palpable cord of IJV, positive Toby-Ayer-Queckenstedt test (Lee *et al*.,2009); meningeal signs (Bianchini *et al*.,2008); papilloedema and Grisienger sign (Kaplan *et al*.,1999). Thrombosis may extend proximally to IJV and distally to other dural sinuses and can also involve ninth, tenth and eleventh cranial nerves (Bradley *et al*., 2002). LST should be given a serious thought as a differential diagnosis in cases presenting with sixth/seventh cranial nerve palsy, signs of intracranial hypertension particularly in pediatric context (Bales *et al*., 2009). History of recent acute otitis media even in absence of otological findings, abnormal otoscopic findings, or longer duration of symptoms might be in the clinical spectrum of LST (Bales *et al*., 2009). The initial evaluation with Computerized Tomography (CT) may be helpful in revealing sinus plate erosion and other possible concurrent intracranial complications. Contrast –enhanced CT may reveal perisinus dural enhancement and filling defect due to non-enhancing thrombus in the affected sinus, the classic "empty delta sign" (Kutluhan *et al*.,2004). MRI is said to have better diagnostic yield than CT in detecting LST because of its ability to highlight flow changes in diseased venous sinuses, clot formation and detecting inflammation in adjacent area (Kaplan *et al*., 1999**)**. Doppler ultrasound of neck can reveal the status of blood flow inside the internal jugular vein, occlusion of the sinus, or extension of thrombosis along jugular vein (Kutluhan *et al*., 2004**)**. Standard treatment protocol encompasses intravenous antibiotics and surgery, whereas anticoagulation and IJV ligation are reserved for specific indications only. The choice of surgery may include radical mastoidectomy, tympanomastoidectomy with or without posterior tympanotomy and ventilation tubes for middle ear ventilation (Holzman *et al*., 1999).

Although, the role of anticoagulation remains much debated, nonetheless, this modality has its own benefits and its institution must far outweigh associated risks. Anticoagulants might prove indispensable in cases with risks of clotting beyond sigmoid sinus, worsening neurologic status, embolism, or fever persisting even after surgery (Bradley *et al*., 2002). Risks associated with the use of anticoagulants are thrombocytopenia, drug interactions, bleeding, osteoporosis, and haemorragic skin necrosis (Bradley *et al*., 2002). Nowadays, current indications for ligation of internal jugular vein (IJV) in the treatment of LST are post-mastoidectomy persistent septicemia, septic pulmonary, or extrapulmonary embolism (Kaplan *et al*., 1999**)**. LST must always be kept in mind as a differential diagnosis where a patient presents with chronic or acute otitis media with otalgia and headache. In our case, we tried to treat the patient, inspite of several concurrent ailments, with aggressive medical management comprising of intravenous antibiotics, anticoagulants and also aiming at continuation of safe pregnancy to the term.

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