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ENT Section

The Management of Otogenic Lateral Sinus Thrombosis – A 6 Year Experience at a Tertiary Care Hospital in North Karnataka, India

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ABSTRACT

Introduction: Chronic Suppurative Otitis Media (CSOM) can give rise to serious intracranial complications. Lateral Sinus Thrombosis (LST) is a rare complication but if it left untreated, can give rise to serious consequences. The objective of this study was to put forth a strategy in the management of otogenic lateral sinus thrombosis with the available resources, considering the low socio economic status of many patients who suffer from this rare but fatal condition. This will encourage the young ENT surgeons to handle these cases efficiently.

Materials and methods: Eleven (11) cases of otogenic lateral sinus thrombosis of a tertiary care teaching hospital in the north Karnataka region of India were included in the study. All the cases presented with various symptoms like otorrhoea, otalgia, headache and fever. The patients were investigated by doing High Resolution Computed Tomography of temporal bone and brain with intravenous contrast. The cases underwent mastoidectomy with opening of the sinus contents and they were covered with intravenous broad spectrum antibiotics. The HRCT of the temporal bone was the only radiological investigation which was carried out in diagnosing the cases, as the patients were from a poor socioeconomic status and as they could not afford to undergo higher investigations like Magnetic Resonance Imaging (MRI) and Magnetic Resonance Venography (MRV) to confirm the diagnosis because of their high costs.

Results: There were no deaths. A combined management strategy of surgery with antibiotics gave a good prognosis in these cases.

Conclusion: In this era of antibiotics, a high degree of clinical suspicion with a proper investigation, followed by a prompt surgical intervention, gives good results in the cases of lateral sinus thrombosis.

Key Words: Lateral sinus thrombosis (LST), Chronic suppurative otitis media (CSOM), Cholesteatoma, Canal wall down mastoidectomy

INTRODUCTION

In the pre antibiotic era, Lateral Sinus Thrombosis (LST) was a well known complication of ear infections [1]. A large series of LST cases have been reported from south Africa and Iran, where the access to the health care is limited [2,3]. The Lateral Sinus (LS), especially the sigmoid portion, is in a close relationship with the middle ear and the mastoid air cells. The infection and inflammation of the middle ear and the mastoid predisposes the LS to thrombosis and thrombophlebitis [4]. After the thrombus formation, the infection may propagate to other sinuses and to the internal jugular vein. The vessel occlusion ultimately obstructs the Cerebro Spinal Fluid (CSF) drainage, leading to a raised intra cranial tension and a hydrocephalus [5,6].

LST accounts for 6% of all the intracranial complications in the era of the antibiotic treatment of suppurative ear diseases. It may be associated with other complications of either the intra or the extra cranial type [7, 8]. The clinical symptoms at presentation may not be of the classical type, but they may be masked or changed due to a previous antibiotic therapy which was received by the patient [1,9]. LST was uniformly fatal until the turn of 20th century, when the first successful surgical interventions were performed [10,11]. The modern reported mortality rates are lower, ranging from 5-10% [3,12,13]. A surgical management in the form of clearance of the disease from the mastoid and the middle ear and opening of the sinus to clear the infective thrombus is the accepted modality of treatment.

MATERIALS AND METHODS

The present study was carried out in the Department of ENT and Head and Neck Surgery, S. Nijalingappa Medical College and the Hanagal Sri Kumareshwara Hospital and Research Centre, Bagalkot, India, from 2006 to 2011. This study was approved by the ethical committee of the college. The present study comprised of 11 CSOM patients with intracranial complications who were admitted to the Department of ENT. An informed consent was taken from the patients. On admission, a thorough clinical history was taken and a clinical examination was done for all the patients. A haemogram, a routine urine study and the culture and sensitivity (c/s) of the ear discharge was done in all the cases. The patients were subjected to high resolution computed tomography of both the temporal bones with brain plain and contrast study. An ophthalmological opinion was taken in all the cases to rule out

papillo-oedema. The physician's opinion was taken in a case of meningitis.

The patients were started on an intravenous antibiotic combination which consisted of ceftrioxone, metronidazole and amikacin, on admission. This combination of antibiotics was chosen to cover the mixed flora which was found in these cases and a change in the antibiotics was made, based on the c/s results. The patients underwent mastoidectomy to clear the disease. The time interval between the day of admission and the surgery was one to three days. The sinus plate was drilled and the sinus was exposed. The perisinus abscess was drained and the perisinus granulation tissue was cleared, whenever it was present. Sinus needling was done to see the presence of the flow of blood. When there was no flow, the sinus wall was opened and the infected thrombus was removed until a healthy thrombus was encountered. No attempt was made to establish the free flow of blood, as this is the accepted method in this antibiotic era. The sinus wall was covered with a piece of temporalis fascia and a layer of gel foam. The antibiotics were continued for 2 to 3 weeks postoperatively. The patients were followed up on regular intervals post operatively.

RESULTS

Age and sex distribution:

Seven male and four female patients were included in this study. The ages of the patients ranged from 10 years to 42 years, with mean of 27.2 years. All the patients were from rural areas and a poor socioeconomic status. The time interval between the onset of the symptoms and the seeking of medical advice ranged between five days to three weeks. The demographic details of the patients are shown in [Table/Fig-3].

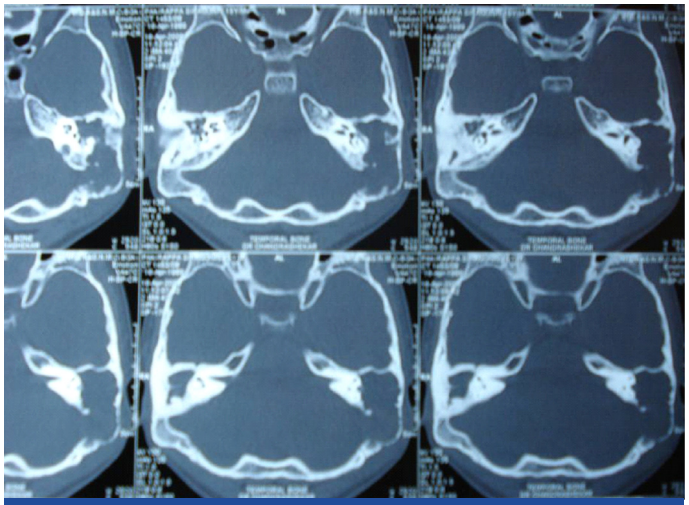
Symptoms:

Ear discharge and ear pain were the most common symptoms which were present in all the patients. Fever was seen in ten patients, vomiting in six patients, and headache in five patients. The clinical symptoms and signs have been detailed in [Table/Fig-4].

Ear findings:

Attic perforation was the most common symptom which was seen and it was seen in nine patients and a central and a marginal perforation were seen in one case each. Cholesteatoma was seen in ten cases and granulation, a post aural abscess and a post aural fistula

[Table/Fig-1]: A case of sigmoid sinus thrombosis with post aural fistula



[Table/Fig-2]: CT scan of a patient showing erosion of sinus plate in a patient with sinus thrombosis

Age in years	Male	Female	No of cases N=11	Percentage%
10-15	1	-	1	9
16-20	2	-	2	18
21-30	3	1	4	36
31-40	1	2	3	27
41-50	-	1	1	9

[Table/Fig-3]: showing demographic details of the patients

SL NO	Symptoms	No of patients
1	Ear discharge	11
2	Earache	11
3	Fever	10
4	Vomiting	6
5	Headache	5
6	Neck (IJV) tenderness	1
7	Symptoms of VII nerve palsy	1
8	Post aural abscess	1
9	Post aural fistula	1
10	Neck stiffness	1

[Table/Fig-4]: showing clinical symptoms

S NO	Ear finding	No of cases
1	Central perforation	1
2	Marginal perforation	1
3	Attic perforation	9
4	Cholesteatoma	10
5	Granulation	1
6	Post aural abscess	1
7	Post aural fistula	1

[Table/Fig-5]: showing clinical findings

SL NO	Surgical finding	No of cases
1	Thrombosis of sinus	11
2	Perisinus abscess	6
3	Sinus plate erosion	8
4	VII nerve canal erosion	1

[Table/Fig-6]: showing clinical findings

[Table/Fig-1] were seen in one case each [Table/Fig-5].

Surgical findings:

Thrombosis of the sinus was found in all the cases. A perisinus abscess was found in six cases and sinus plate erosion was found in eight cases. Erosion of the facial canal was found in one case. [Table/Fig-6].

DISCUSSION

The diagnosis of LST has become increasingly difficult because of the previous antibiotic therapy and the vague non specific symptoms, [9,11,14]. In our study, the patients were from rural areas where the services of qualified ENT surgeons were not available and the patients had already been treated with antibiotics for a variable period by the local doctors. Because of the poor socioeconomic condition of the patients, they could not afford to undergo MRI for the confirmation of the diagnosis because of its high costs.

LST commonly develops as a result of bone erosion and a spread of the infection to the sinus [15]. It can occur by a thrombophlebitic spread [9,10,15]. In our series, eight patients had erosion of the sinus plates and three had intact sinus plates. In the pre antibiotic era, the patients had presented with the classical picket fence type of fever due to the periodic release of bacteria into the blood stream [11]. The introduction of antibiotics has changed the clinical presentation and also the bacterial isolation on culture. Many times, the cultures yield a mixed flora [10,11,16]. Our patients presented with otorrohoea, fever and earache as the main complaints. One patient had a neurological involvement in the form of facial nerve paralysis.

The Computerized Tomography (CT) scan and MRI are the mainstay of the investigations in LST. In our study, we had to deviate from this standard protocol because of the poor socioeconomic status of our patients who were unable to bear the expenses of MRI. A CT examination with thin cuts of the temporal bone, with contrast enhancement, shows the classical empty delta sign due to the non filling of the thrombosed sinus and the enhancement of the sinus wall and the perisinus collaterals [17]. In the last decade, Magnetic Resonance Angiography (MRA) and Magnetic Resonance Venography (MRV) had been used to differentiate the slow venous flow from the occlusive thrombus [17]. In our series, all the patients underwent CT scan of the head, with fine cuts of the temporal bone and a contrast enhancement, which revealed the classical delta sign. The CT scan also showed sinus plate erosion in eight patients [Table/Fig-2]. One patient had VII nerve canal erosion and one patient had extension of the thrombus into the internal jugular vein.

The surgical management of LST involves a mastoid exploration, clearance of the perisinus granulations or the perisinus abscess, exposure of the sinus and needling of the sinus. Then, the sinus is incised and the thrombus is removed as much as possible [10,11,18]. An attempt to establish the free flow of blood from both the ends is not necessary [9]. In our series, we followed the same pattern of the surgical management and the needling of the sinus was done to confirm the thrombus. Then, the sinus wall was incised. Out of eleven patients, ten patients underwent canal wall down mastoidectomy and one underwent intact canal mastoidectomy.

The use of anticoagulants to arrest the spread of the thrombus may increase the risk of venous infarctions. Thus, their use is not recommended routinely [19]. If there is a propagation of the thrombus after surgery, anticoagulants are recommended [16]. In the same manner, in the pre antibiotic era, ligation of the internal jugular vein was done routinely to prevent the spread of the thrombophlebitic process and the septic emboli [10]. However, the recent concept does not advise the ligation of the internal jugular vein because of the modern antibiotic therapy [9]. In our series, one case with internal jugular extension did well with ear surgery and antibiotics alone. No attempt was made to ligate the internal jugular vein.

CONCLUSION

Lateral sinus thrombosis, although it is a rare complication, with the advent of antibiotics, It can still be seen in populations with access to poor medical facilities and in poor socioeconomic groups. An awareness of this complication is necessary for an early diagnosis and a prompt treatment. Nowadays, the outcome of the treatment with antibiotics and surgery is good. Only minimal investigative procedures like HRCT could be afforded by our patients.

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