

# OTITIC HYDROCEPHALUS

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## SYNOPSIS

**A case of otitic hydrocephalus is presented and used as an introduction to the discussion on the pathogenesis, investigations, diagnosis and management of this rare complication of CSOM.**

## INTRODUCTION

Chronic suppurative otitis media (CSOM) is a common disease seen in ENT practice in this country despite a rise in the standard of living over the last few decades. Unfortunately, many of these patients seek medical helps only when complications arise (Figure 1). A case of otitic hydrocephalus due to CSOM was seen recently in the ENT Department of the University Hospital and an account of the management of this rare complication is presented in this paper for discussion.

## CASE REPORT

A seventeen year old Indian male presented to us with a history of bilateral ear discharge for five years, more copious in the right ear and 10 days history of deep seated right earache; giddiness with nausea and vomiting and chills with rigors. He has been a schizophrenic, on treatment for many years. Examination revealed a febrile, vertiginous patient with nystagmus to right. General and systemic examinations did not reveal any abnormality. Optic discs were normal on fundoscopy. Otoscopy revealed both canals filled with polyps with mucopurulent discharge and a positive fistula sign on the right ear. There was no evidence of Griesinger's sign over the right mastoid region.

The patient was admitted and Investigations done were as follows: A right ear swab grew *B. Proteus* sensitive to Ampicillin and Bactrim. Mastoid X-rays (Towne's, Stenver's, lat. oblique) done showed a large radiolucent cavity in the right attic region and? cholesteatoma. Audiometry revealed bilateral conductive loss of 40-50 dB. An ENG (Gaze test) done showed first degree nystagmus to right. His Wbc was 12,500. Other blood and radiological examinations were normal.

The patient was admitted as a case of CSOM with labyrinthine involvement and was started on IV Penicillin and Sulphadiazine sixth hourly. Two days later, with the control of his nausea, vomiting and an improvement in his general conditions, his mastoid was explored under general anaesthesia. A large cholesteatoma was detected at surgery which was exteriorized and a modified radical mastoidectomy was performed. Sinus plate was noted to be intact during the operation. The patient made a good recovery with no further vertigo, nausea and vomitings. However, one week post-operatively, the patient complained of blurring of vision and diplopia on looking to the right. He was otherwise well clinically. Ophthalmology consultation was sought for. The findings were as follows:

- (1) Bilateral papilloedema.
- (2) Visual acuity — Right 6/24, Left 6/18.
- (3) Hess chart revealed possibility of slight right lateral rectus palsy.
- (4) Bjerrum's screen showed enlargement of blind spots bilaterally.

Skull X-rays and CT scan did not reveal any abnormality.

In view of the deteriorating visual acuity (Right 6/24, Left 6/36), a diagnostic lumbar tap was made (Findings:- Opening pressure 300 mm of water.

Pressure on compressing of left neck was 330 mm of water. No increase of pressure was found on compression of right neck, i.e. positive Toby Ayer's test). The culture of the CSF was normal. Blood culture was negative. A final diagnosis of otitic hydrocephalus was made. Five lumbar punctures were done with withdrawal of 5-10 ml of CSF each time, as a therapeutic measure to bring down the CSF pressure. He was discharged well five days after the last LP with improvement of the acuity to Right 6/18, Left 6/12 and the resolution of the papilloedema.

## DISCUSSION

Our patient is a typical patient with CSOM in this country who seeks helps only when complications arise. More than one of the complications listed in Figure 1 can arise in the same patient. This is exemplified by our patient who developed acute labyrinthitis initially on presenting to us. The labyrinthitis was successfully treated by antibiotics and surgical (modified radical mastoidectomy) eradication of the underlying cholesteatoma. However, he developed the second complication of otitic hydrocephalus one week later while recovering in the ward from the mastoid operation.

Otitic hydrocephalus is a rare complication of chronic suppurative otitis media (Figure 1). The term was first used by Symonds (1) (1931) to describe a syndrome of raised intracranial pressure with clear cerebral spinal fluid (CSF). Apart from transient 6th nerve palsy and signs and symptoms due to raised intracranial pressure (ICP), (i.e. headaches, vomiting, blurring of vision, papilloedema and blind spots) there are no other detectable CNS signs. There is no actual dilation of ventricles; hence a misnomer.

The raised ICP is most probably due to thrombosis of superior sagittal sinus, leading to obstruction and blockage of arachnoid villi. As a result, there is an impairment of CSF absorption and raised intracranial pressure (2). The cause of the superior sinus thrombosis is unknown though it is postulated that middle ear infection reaches the wall of the lateral sinus provoking a localised aseptic thrombophlebitis. An intrasinus mural clot formation then forms with retrograde spread of this thrombus into the superior sagittal sinus causing blockage of the arachnoid villi and CSF engorgement. Otitic hydrocephalus is seen almost always in children and young adolescents and is said to be more commonly due to diseases in the right ear than the left ear. This may be due to the fact that right lateral sinus is more commonly continuous with superior longitudinal sinus.

FIGURE 1  
COMPLICATIONS OF CHRONIC SUPPURATIVE OTITIS MEDIA

Intratemporal	Intracranial
(1) Mastoiditis	(1) Extradural abscess
(2) Petrositis	(2) Subdural abscess
(3) Facial paralysis	(3) Brain abscess
* (4) Labyrinthitis	(4) Venous sinus thrombophlebitis
	* (5) Otitic hydrocephalus
	(6) Meningitis

\* = Complication suffered by our patient

The diagnosis is made by exclusions and the most important differential being brain abscess. CT scan of the brain and lumbar puncture with Toby Ayer's test formed the specific investigations. The former to exclude brain abscess and the latter, lumbar puncture, is both diagnostic and therapeutic. CSF pressure as high as 300 mm of water is commonly found when a lumbar puncture is done. Majority of cases resolved spontaneously.

For those that failed to resolve, treatment is directed at restoring the raised ICP pressure to normal and thereby protecting the retina from the effects of sustained papilloedema (i.e. optic atrophy and permanent impaired vision). This can be achieved by (1) medical, (2) surgical means. In the medical treatment, dehydrating agents such as frusemide and also

steroids have been used though they have no proven values. Lumbar punctures, which may have to be repeated remain the most important mode of treatment as exemplified by our case. Ventricular-peritoneal shunt may be required in resistant cases where the ICP remains unabated by repeated lumbar punctures. It is also essential that the middle ear diseases should be eradicated surgically by mastoid surgery as soon as the clinical condition of the patient allows.

## REFERENCES

1. Symonds C P: Br Med J 1940; ii: 348.
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