

INTRACRANIAL SUPPURATION FOLLOWING INFECTION OF THE EARS AND SINUSES

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With the Advent of antibiotics one would have imagined that intracranial suppuration would be a disease of the past but on reading literature on the subject and in our daily work one was made conscious of the fact that though the incidence may be decreasing in some countries, they are still encountered from time to time. In the state of Singapore intracranial suppuration following infections of the ears and sinuses is still encountered without

decrease in its incidence in spite of the widespread use of antibiotics, a reasonably good health service and a favourable doctor to patient ratio: approximately 1 doctor to every 2,000 population. The following figures of all brain abscesses including those from the ears and sinuses are obtained from the Medical Records Office, General Hospital, Singapore from the year 1957 to 1962:

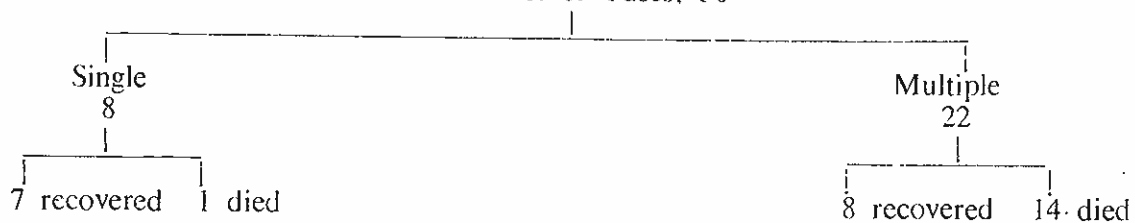
Brain Abscess, General Hospital, Singapore 1957 to 1962

Year	Total No.	Deaths	From Ear	Result	From Sinuses	Result
1957	12	7	Nil		Nil	
1958	13	8	3	2 died 1 living	Nil	
1959	13	8	4	1 died 3 living	Nil	
1960	11	6	3	1 died 2 living	2	1 died 1 living
1961	20	16	3	2 died 1 living	Nil	
1962	12	11	1	1 living	Nil	

Royal Victoria Infirmary
Newcastle upon Tyne

Cerebral Abscess 1944 to 1960

Total No. of Cases: 30



CASE 1.

P. S. P. a 14 year old male Chinese boy was admitted to E.N.T. Unit with a history of:

7 years purulent discharge from the left ear off and on, 3 weeks fever and left earache followed by swelling behind the left ear.

He was treated as a case of left mastoid abscess by incision and drainage followed by Injection Procaine Penicillin and Streptomycin. He responded very well to the treatment and was discharged with an appointment to return for Mastoidectomy. Unfortunately, he failed to keep the appointment. He was re-admitted to the Medical Unit and was transferred to the E.N.T. Unit on the same day with a history of 10 days fever, vomiting off and on, 4 days impairment of the sight of his left eye and feeling sleepy.

On examination he was afebrile, pulse was 60 per minute Blood Pressure 110/70 mm mercury. He was drowsy in Coma I. His neck was not rigid and Kernig's sign was negative. Fundus Oculi showed bilateral papilloedema with haemorrhages. Motor and sensory systems were normal; cranial nerves were intact. The superficial abdominal reflex was sluggish on the right but brisk on the left. Plantar reflex showed right extensor response. Heart, lungs and abdomen were normal. Lumbar puncture was done and the cerebro-spinal fluid showed increased pressure — 250 mm of water, but its content was within normal limits.

He was diagnosed as a case of cerebral abscess secondary to left mastoiditis. An emergency mastoidectomy and tapping of brain abscess was carried out. A subperiosteal abscess was encountered; it was drained; cholesteatoma was removed from the mastoid antrum. The tegmen tympani was eroded and a little pus was found over the dura with some granulation tissue attached to the dura. The dura was found to be under tension; the right temporal lobe of the brain was explored with a brain needle and 40 cc of greenish yellow pus was aspirated from a depth of 3 cm. 125 mgm of streptomycin and 10,000 units of crystalline penicillin were introduced into the abscess cavity. The incision was closed with drainage rubber dam for the subcutaneous tissue space. The patient recovered from the operation and drowsiness disappeared and vomiting and headache cleared up.

CASE 2.

L.P.K. a male Chinese boy age 7 was admitted into Surgical A. Unit with a history of 1 year purulent discharge from the left ear; 3 days fever, and rigor, 1 day swelling behind the left ear and the left side of the face.

On examination, the boy looked ill with a temperature of 100°F. The left face was

swollen and there was a fluctuant swelling on the left scalp extending from the left mastoid region to the left parietal region. There was a purulent discharge from the left ear. He was mentally clear; there was no neck rigidity; there was no localising signs and the reflexes were normal; cranial nerves were intact. Fundus Oculi showed no papilloedema. The heart, lungs, and abdomen were normal. X-ray of mastoid showed left mastoiditis with cholesteatoma. The abscess in the scalp was drained and the patient was transferred to the E.N.T. ward. Lumbar puncture was done; the c.s.f. was normal. Blood count showed T.W. 16,200, Polym 85, Lymph 13, Mono 2.

Mastoidectomy was done; a large subperiosteal abscess was drained and a large cholesteatoma was removed from the mastoid antrum. The tympanic membrane was destroyed, so were the ossicles. 20 cc of pus was evacuated from the extra-dural space. The incision was closed with a rubber dam to the subcutaneous tissue spaces. The culture of the pus showed *B. Proteus* organism sensitive to chloromycetin and streptomycin.

Patient recovered and was discharged 1 month after the operation.

CASE 3.

P.C.H. a male Chinese age 22 was admitted to the Eye Unit with a history of 2 weeks swelling of the right eye with double vision associated with fever and rigor. He had also right nasal obstruction with purulent nasal discharge for a period of 1 month. He was found to have an orbital abscess which was drained and antibiotics given. 10 days later he developed headache, drowsiness and vomiting. An X-ray of the sinuses showed frontal sinusitis and opacity in the right maxillary antrum. He was then transferred to the E.N.T. Unit for treatment of the pan-sinusitis. On examination, the patient was afebrile, drowsy but able to answer questions when asked. The right eye was proptosed owing to cellulitis of the orbit. The pupils were unequal in size: the left was bigger than the right; however both pupils reacted to light. The fundus oculi was normal. The neck was rigid and the Kernig's sign was positive. All the cranial nerves were intact; the motor and sensory parts of the central nervous system were normal. Reflexes were brisk. Heart, lungs and abdomen were normal. Lumbar puncture showed that the cerebro-spinal fluid was under pressure — 400 mm of water; cells 140,

chlorides 720 mgm%, Globulin negative, Glucose 78 mgm%, Total Protein 50 mgm%, no organism, Lymphocytes +. He was treated as a case of meningitis secondary to orbital abscess and pan-sinusitis. He was given intramuscular and intrathecal crystalline penicillin and oral sulphadiazine with Mist. alkali. He did not respond too well to the treatment although the cerebro-spinal fluid showed some improvement; there was a drop in the cell count from 140 to 7. However, he remained drowsy and continued to have headache and vomiting; the neck rigidity and Kernig's sign persisted. At the same time he developed bilateral papilloedema and weakness of the left upper limb. The reflexes were brisk and the plantar response was normal. The other systems were normal.

Exploration of the frontal sinus was done. The frontal sinus was found to be inflamed. The frontal lobe of the brain was explored with a brain needle. An abscess cavity with thick wall was encountered and 10 cc of thick pus was aspirated.

After the operation, he improved rapidly; vomiting and headache subsided and motor power returned to the left upper limb. He was discharged fit after 4 weeks in hospital.

CASE 4.

L.Y.E. a 26 year old female Chinese was admitted on 3/1/59 with a history of 3 months right ear discharge, 1 week pain in the right ear and 1 day nausea, vomiting, fever and headache. Examination revealed that she had a temperature of 101°F. She was conscious but lethargic. There was a polyp in the right ear. Hearing test showed aid conduction deafness on the right and normal hearing on the left. Weber test showed lateralisation to the left. Absolute bone conduction showed normal hearing in both ears. Other parts of E.N.T. were normal. Neck was rigid and Kernig's sign was positive. Fundus Oculi showed no papilloedema. Neurological examination showed no localising signs. Lumbar puncture showed that the cerebro-spinal fluid was under pressure and turbid in colour. cells 2000/ cm. chloride 600mgm% globulin ++, glucose 26mgm%, Total Protein 600 mgm%, smear—no organism, Polyp ++++, Lymp. ++ R.B.C. +.

She was diagnosed as a meningitis following chronic otitis media. She was treated with systemic Injection Penicillin, oral sulphadiazine and alkali and intrathecal crystalline penicillin daily. 10 days after admission, the

patient became comatose — Coma 2. Her left upper and lower limbs were atonic and motor power was poor. The right upper and lower limbs were normal in tone and power.

Reflexes; Ankle jerk — on right, — on the left
Knee jerk — „ „ — „ „ „
Plantar response
Superficial abdominal response — —
— —
— —

Fundus oculi showed papilloedema. She was taken to the operating theatre and the right mastoid was explored. The right temporal lobe of the brain was probed with a brain needle and 27 cc of thick foetid yellow pus was aspirated. Culture of the pus showed coliform organism. The wound was closed up and the patient returned to the ward. She recovered consciousness and the tone and power of the left upper and lower extremities. 2 weeks later the temporal lobe was needled again but there was no more pus. The patient recovered and was discharged after 30 days hospitalisation. She has been followed up regularly without any evidence of any complications.

CASE 5.

H.B.M. a male Malay boy aged 10½, was referred by Medical Unit II with a history of 6 days fever, headache and had a fit; there was no ear discharge but there was a previous history of otorrhoea.

On examination he was drowsy; his neck was rigid. He had a left otitis media. There was a right facial palsy (L.M.N.) and a right hemi-paresis. The biceps jerk, ankle jerk, knee jerk were normal; the plantar response was extensor on both sides. Fundus oculi showed papilloedema. Lumbar puncture was done; the fluid was under pressure and turbid in colour; cells 980/ cm chlorides 630 mgm%, globulin +, glucose 54 mgm%. Total Protein 200 mgm% smear showed no organism, Lymphocytes +.

He was taken to the Operating Theatre and his left mastoid was explored. Cholesteatoma was found in the mastoid antrum; this was removed. An intracerebral abscess in the left temporal lobe was located and 20 cc of thick smelly pus was aspirated. The wound was closed. The following day, he was still drowsy but improved; the right hemi-paresis cleared up. On the second day following operation he could answer questions; and on the 3rd post-operative day he was fully con-

scious. On the 4th and 5th post-operative day, he was better still but the fundus oculi showed some papilloedema. X-ray of the skull showed the dye delineating a small abscess cavity in the posterior part of the left temporal lobe.

On the 6th post-operative day, he suddenly became cyanotic and became unconscious, coma 4. Resuscitative measures had to be given. He died on the 7th post-operative day without regaining consciousness. Post-mortem was requested but consent was not obtainable from the relatives.

CASE 6.

T.S.C. a male Chinese boy age 11 was referred from the Medical Unit II with a history of 20 days fever, 10 days headache and drowsiness, 8 months purulent discharge from the left ear. 8 months previously he was seen at the E.N.T. Out-patient and was advised to have an ear operation but the patient refused.

On examination he was drowsy, irritable; temperature 101°F, Blood pressure 110/80. Neck was rigid. The Central nervous system was normal except that the right plantar response was extensor. Fundus oculi showed no papilloedema. The heart, lungs and abdomen were normal. Lumbar puncture was done, the cerebro-spinal fluid was under pressure; cells 4,800/cm, chlorides 680 mgm%, globulin ++ glucose 16 mgm%, Total protein 300 mgm%, no organism. Polymorp ++ Lymph. +, R.B.C. +.

He was treated with Injection Penicillin systemically and also oral Sulphadiazine and Mist. Alkali.

29 days after admission, the right upper and lower limbs became hypotonic; there was right ankle clonus and right facial nerve palsy. He was taken to the operating theatre and a left mastoidectomy was done. The mastoid appeared to be well pneumatised and healthy. However, the brain was found to be under tension. The left temporal lobe was explored with a brain needle and 3½ cc of thick pus was aspirated. He returned to the ward and regained consciousness; the right facial paralysis and the weakness of both the upper and lower limbs on the right side cleared up. The patient recovered and was discharged from hospital.

CASE 7.

S.A.B.B.A. a Malay boy aged 10 was referred by medical unit with a history of 10

days fever, rigor and headache; and purulent discharged from the right ear, 1 day swelling behind the right ear. On examination, the temperature was 102°F.; he was conscious. His neck was rigid. There was a large fluctuant and tender swelling over the right mastoid and right upper neck. Lumbar puncture was done; Cerebro-spinal fluid: cells 18/cm, chloride 700 mgm%, globulin negative, glucose 63 mgm%, total protein 30 mgm%, smear showed no organism. The abscess in the right neck and the right mastoid were drained and antibiotics were given. The culture of the pus showed Strep. viridans.

5 days after the incision, the temperature was still swinging; the neck was not rigid. Kernig's sign was positive. Lumbar puncture was done, the cerebro-spinal fluid was turbid and under pressure — 265 mm of water; cells 460/cm, chloride 700 mgm%, Globulin +, glucose 33 mgm%, total protein 140 mgm%, smear showed no organism, few R.B.C., Lymphocytes +, few polymorp.

On the 6th day after the incision of the neck and mastoid abscess, the patient became unconscious, Coma 3. The pupils were dilated; the lower limbs were flaccid; the plantar response was extensor on both sides. He was taken to the theatre and his mastoid opened up; cholesteatoma was found in the mastoid antrum and removed; the lateral sinus was thrombosed and pus was around it. The temporal lobe was tapped and 10 cc of thick pus was aspirated; the wound was closed up and the patient was sent back to the ward. Unfortunately, he died the following night.

CASE 8.

C.K.P. a male Chinese boy age 11 was referred by the Medical Unit with a history of 2 years discharge from the right ear, 2 weeks pain over the right ear associated with fever, rigor and vomiting; 1 day inability to walk and loss of consciousness. On examination he was in coma 2; his general condition was poor. Blood pressure 126/80; he was emaciated. The right ear was discharging pus; the left ear was normal. His neck was not rigid. The motor and sensory parts of the central nervous system were normal except that the plantar response on the left side was extensor. Lumbar puncture was done and the cerebro-spinal fluid showed that the cells 2/cm, chloride 760 mgm%, Globulin + mgm%, total protein 30 mgm%, smear showed no organism and few lymphocytes.

He was taken to the operating theatre and the right mastoid was explored. There was a small cholesteatoma in the antrum. The dura and the lateral sinus were exposed; the dura was found to be normal; but the granulation tissue was found covering the Lateral sinus. Thick greenish pus 20 cc in amount poured out when the bone covering the lateral sinus was removed. The brain was explored with a brain needle but no pus was aspirated. The wound was closed up. On the 2nd post-operative day the patient regained consciousness and the temperature returned to normal. He recovered uneventfully and was discharged fit and well.

COMMENTS

16 cases of intracranial suppuration following ear and sinus infection were seen from 1957 to 1962; of these, 7 died. Of the 7 cases that died, 4 died before operative intervention could be undertaken. Post-mortems were not done as consent from the relatives was not obtainable. These deaths were presumably the result of cerebral compression or rupture

of the abscess into the lateral ventricle. Case 5 died probably as a result of the remaining abscess cavity bursting into the lateral ventricle. Case 7 may have died as a result of cerebral compression, septicaemia and toxæmia. The mortality rate for these cases was 43.7%. This figure compared favourably with the 50% mortality obtained at the Royal Victoria Infirmary, Newcastle Upon Tyne: 30 cases were seen from 1944 to 1960 and there were 15 deaths.

Of the 16 cases seen here, the routes of infection intracranially were mostly by direct extension and erosion of the bone; others spread intracranially by way of the venous blood stream. It may be noted that intracranial suppuration from the ear was 7 times more frequent than from the sinuses.

REFERENCE

Pennybacker, J., (1961), Discussion on the Intracranial complications of Otogenic Origin, *Pro. Roy. Soc. Med.* 54., 309.