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A Rare Complication of Cyanotic Congenital Heart Disease-Brain Abscess

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Abstract: ***Background: Intracranial abscess in the paediatric population is a rare occurrence-4 in a million; it is a focal, intra - cerebral infection that starts off as a localized lesion and finally develops into a collection of pus surrounded by a well-vascularized capsule. It is a rare complication of Cyanotic congenital heart disease. The peak incidence occurs when the child is between 4 years and 7 years of age, although it may occur in adults with cyanotic congenital heart disease.***

Keywords: Brain abscess, Cyanotic congenital heart disease, Dextrocardia , Situs inversus , Burr hole craniotomy , Tapping , MRI Brain

1. Introduction

Intracranial abscess in the paediatric population is a rare occurrence-4 in a million; it is a focal, intra –cerebral infection that starts off as a localized lesion and finally develops into a collection of pus surrounded by a well-vascularized capsule.

It is a rare complication of cyanotic congenital heart disease. The peak incidence occurs when the child is between 4 years and 7 years of age, although it may occur in adults with cyanotic congenital heart disease.

In cyanotic congenital heart disease, hyper viscosity of blood resulting from compensatory polycythemia and the sluggish flow in the microcirculation of the brain forms an infarct by intravascular thrombosis.

Along with this, decreased oxygen tension or brain hypoxia might enhance the flow of shunted blood containing microorganisms followed by focal cerebritis.

2. Case Report

A 7-year-old female child who was a k/c/o cyanotic congenital heart disease diagnosed at 3 months of age was brought to our hospital with h/o headache since 4 days, neckpain since 3 days, vomiting and loose stools since 1 day.

O/E

On admission the child was irritable, vital signs: temp: 98.7 degree F, RBS: 223 mg/dl, heart rate: 120/min, respiratory rate: 30/ min, regular with no abnormal pattern, blood pressure – 120/70 mmhg, oxygen saturation on room air was 86%. The child had central cyanosis and grade 4 clubbing (Image 1) in all four limbs. They had right subconjunctival hemorrhage. Fundus examination-right eye: optic disc edema.

On cardiovascular examination, apical impulse is at right 4th ICS 3cm medial to midclavicular line with grade 3 pansystolic murmur with soft s1 and loud s2, at 2nd left intercostal space p2 is loud with short systolic murmur.

On neurological examination: There was no cranial nerve involvement, normal deep tendon reflexes, there was neck rigidity but no kernig's and Brudzinski's sign.

3. Investigations

Complete blood count: Hb: 18.9 mg/dl, haematocrit-60.6%, wbc-22, 800 cells/mm3, with 88.3% granulocytes, 6.1% lymphocytes, Platelets: 1.43 lakh. Renal function tests: urea-24 mg/dl, creatinine-0.7 mg/dl, Serum electrolytes: Sodium-134 mmol/l, potassium-4.2 mmol/l, chloride-107mmol/l. Blood cultures of 2 samples were sent which did not show any growth. CRP-91.6mg/dl.

Urine routiens: pus cells: 2-4, no RBC & without albuminuria and glycosuria.

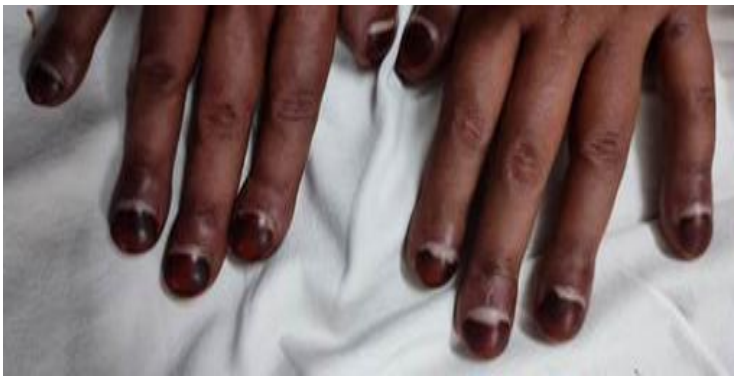


Image 1: Grade 4 clubbing

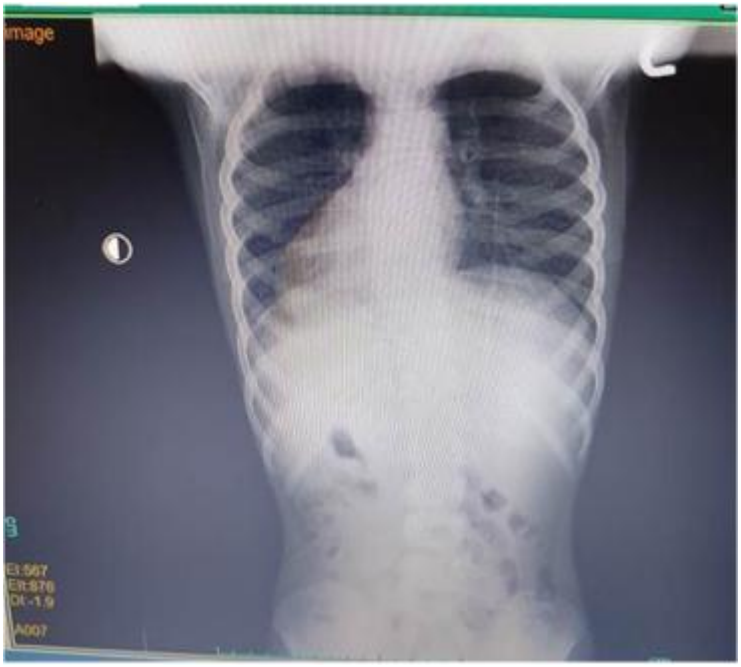
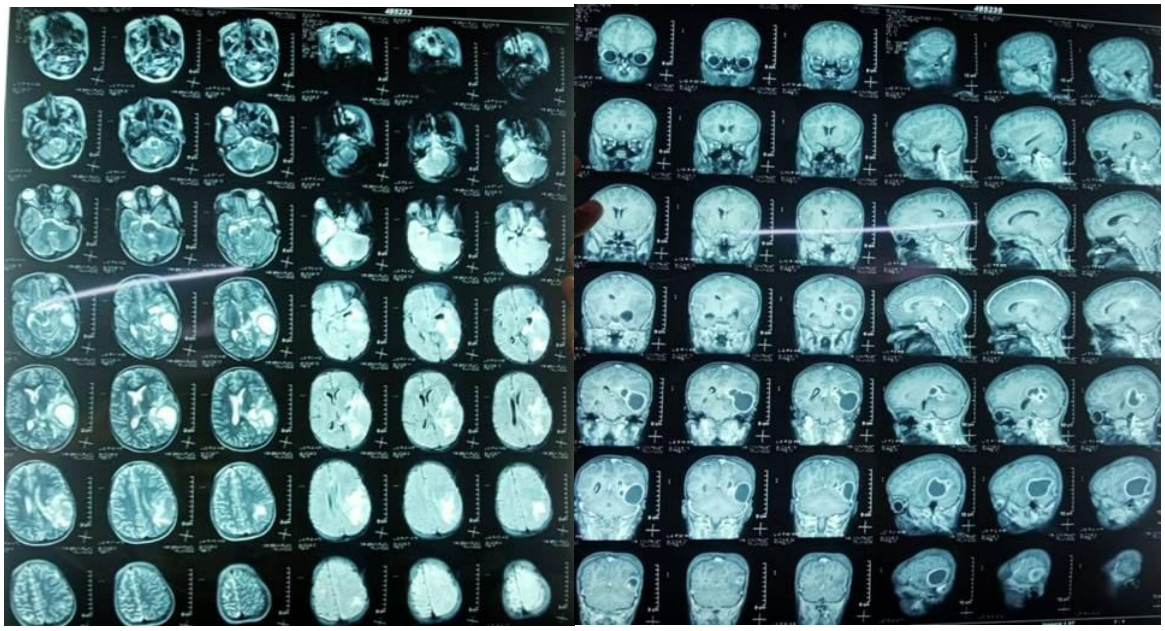


Image 2: Chest x-ray with abdomen showing Dextrocardia with Situs inversus



3 (A) 3 (B)

Image 3 (A, B): MRI Brain showing large lesion measuring 4.5 × 3.6×5.0 cm with moderate perilesional edema in left temporo-parietal region with midline shift of 7.0 mm to right side with a central necrotic area suggestive of Brain abscess.

4. Treatment

- The child was started with intravenous fluids, injection ondansetron, injection ceftriaxone initially later upgraded to injection vancomycin and injection meropenem.
- The child underwent left temporal burr hole craniotomy + tapping and pus was sent for afbsmear, gram stain and culture: no bacterial growth after 48hrs of aerobic incubation.

Post-surgery, child did not have any s/o neurological deficit, and advised to continue antibiotics for 4 weeks, with one antiepileptic levetiracetam and discharged. Adviced for follow up for removal of sutures. After 4 weeks sutures were removed, no s/o neurological deficit or any fever.

5. Discussion

- Clinically, children usually present with vomiting, fever, headache, seizures, focal neurological signs; eventually papilledema; coma, but these manifestations may be subtle at the initial stage.
- In our patient, the child did not have any focal neurological signs, paresis /paraplegia except headache and vomiting.
- Neuroimaging forms the mainstay of diagnosis. Optimal therapy depends on the size of the abscess, if less than 2 cm in diameter, they may be treated with antibiotics with a follow up neuroimaging study to look for a reduction in the size. If greater than 2cm, aspiration maybe preferred.

- Our patient responded well by administration of meropenem and vancomycin. Post –operative care should prompt and development of raised intracranial pressure should be avoided. Uncontrolled rise of intracranial pressure may lead to brain herniation. Osmotic diuretics and hypertonic saline can be administered for the same depending on child's hemodynamic status and serum electrolytes.

6. Conclusion

- In a child with congenital cyanotic heart disease, focal neurologic abnormalities or signs of raised intracranial tension must be considered as indications of the probable presence of a brain abscess unless proven otherwise.
- Craniotomy plays an integral part in treatment of brain abscess with favorable outcome, especially if the entire capsule is removed.

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