A CASE OF DIFFICULT MENINGITIS

Padmavathy V
PROF. P. RAMACHANDRAN
G5 WARD
ICH & HC
Clinical profile

- 2 yr. old male child from Chennai
- Informant being grandmother and father
- 1st born out of Non-consanguineous marriage
- Uneventful perinatal period, No NICU admissions
- Developmentally normal
- Immunized till date
Presenting complaints - 14.10.10

✓ Fever for 15 days - high grade, intermittent a/w chills. No rigors
✓ h/o dribbling of urine for 15 days
✓ h/o lethargy & irritability
✓ Apparently normal till 6months ago
Contd..

✓ h/o frequent episodes of fever and treated by multiple private practitioners with antibiotics for UTI (E.coli once in Urine c/s)

✓ Was admitted in Stanley med college two months back for similar complaints, Urine c/s-E.coli HS to Amikacin; treated with IV amikacin. Subsequent urine cultures in Stanley were sterile. MCU-normal study

✓ No h/o contact with a case of tuberculosis
On examination

- Febrile
- Irritable
- Neck rigidity +
- Pupils ERTL, No nystagmus/lid twitch
- No cranial nerve deficit
- Tone decreased in both lower limbs
- Power 5/5 in both UL ; 4/5 in both LL
- DTR ++ in UL ; Sluggish knee jerks, absent ankle jerks
- Plantar flexor ; Cremasteric reflex + ; abd reflex +
- Phimosis +
- CVS/RS/Abd - No abnormality detected clinically
INITIAL IMPRESSION

RECURRENT URINARY TRACT INFECTION,
To rule out acute CNS infection.
Initial workup- 14.10.10

- Counts: Hb 10.8gm%
- TLC 14800, P76 L23 E1
- Plat 2.8 lakhs
- Microcytic hypochromic RBCs with anisopoikilocytosis, platelets seen singly & clumps.
- Urine Routine: Alb/sug - nil, 2-3 pus cells/hpf
- Ultra sonogram Abd & pelvis- Normal study
Lumbar Puncture on 15.10.10

- Frank pus
- Plenty of pus cells
- P 73 L 27
- Gram positive cocci in clusters
- Culture - Coagulase positive Staphylococcus aureus;
- HS to Vancomycin, Gentamicin, Ciprofloxacin, Chloramphenicol
OUR WORKING DIAGNOSIS

Staphylococcal meningitis
Other investigations

- Blood Gl: 104mg/dl
- Urea 20mg/dl; Cr 0.5
- e- 134/3.2/17 meq/l
- Calcium- 9mg/dl
- TBR<1
- OT/PT 26/20 IU
- S . Proteins- 6.4 gms (3.4+3.0)
- NEC - No growth
- Urine C/S- E.coli HS to Amikacin
- HIV - non reactive
- TB work-up - negative
- CT Brain plain & contrast - Normal study, suggested to double the dose of contrast next time if a CT is repeated
Course in the hospital

- Inj. Vancomycin 60mg/kg/d.
- Inj. Amikacin after the urine culture reports.
- Neurologist advised to continue the antibiotics.
- Repeat Urine C/S on 24.10.10 - No growth
- Child persisted to be febrile and irritable.
- Neurologic status remained the same.
Lumbar Puncture on 27.10.10

✓ FRANK PUS AGAIN!
✓ Plenty of pus cells P95 L5
✓ Gram positive cocci in clusters
✓ AFB negative
✓ Latex agglutination-negative
✓ Sugar-25, Protein-not done
✓ C/s - **Coagulase positive Staph aureus**
✓ HS to Vancomycin, Gentamicin, Ciprofloxacin & Chloramphenicol. NS to Ampicillin & Oxacillin
REVISED DIAGNOSIS

? Resistant staphylococcal meningitis with an unidentified primary focus
Course in the hospital- Contd.

- Tab. Rifampicin 15mg/kg/d as an adjunct
- Child was started on Inj. Meropenem 60mg/kg/d
- Repeat CT Brain plain & contrast - Normal.
- CXR & Echocardiogram - Normal.
- Ultra sonogram of joints - Normal.
- NBT assay - Negative.
- Immunoglobulin profile - Normal.
- Persisted to be febrile and irritable.
- Non-convulsice Status epilepticus on 31.10.10.
Contd.

- Plan was to add Inj. Chloramphenicol
- Inj. Ciprofloxacin was added
Lumbar Puncture on 09.11.10
✓ Frank pus again!!!
✓ Plenty of pus cells P90 L10
✓ Gram positive cocci in clusters
✓ CSF sugar- 20mg/dl
✓ CSF Protein- 5100mg/dl
✓ C/S- Coagulase positive Staph aureus
✓ Cultures sent to Apollo & Infectious disease consultation obtained.
Neurologist’s review

✓ Chronic meningitis / ?Recurrent meningitis
✓ To consider ATT.
✓ To consider fungal, parasitic & cryptococcal infections.
✓ To repeat Retroviral screening for both the parents & the child.
✓ To Revise antibiotic therapy.
✓ MRI brain & spine screening.
What do you think is the diagnosis?

Here we have, a sick child with purulent aspiration in lumbar puncture growing Staph aureus every time!
Extra medullary Intradural mass lesion extending from L1 – S2,

- Abscess
- Myxopapillary ependymoma
- With Spinal cord edema
- With Ependymitis
Follow up

✓ Referred to neurosurgeon at MMC, GH.
✓ Taken over and operated.
✓ HPE: Suggestive of Epidermoid Cyst.
✓ Discharged by one week
✓ Neurologically intact and doing well.
Spinal tumors in Children

Extradural

Intradural

Extramedullary Tumours

Intramedullary tumours
Spinal Epidermoid Cysts

- Incidence: 0.7% of spinal tumors
- Acquired Epidermoid cysts follow a spinal tap, trauma or surgical procedures.
- Congenital Epidermoid cysts are due to inclusion of ectoderm during closure of neural tube at 3-5 week of gestation.
- May be associated with congenital dermal sinuses, spina bifida;
- Seen most often in the lumbosacral area.
- Epidermoid cysts may be Intradural or intramedullary in location.
- Treatment includes subtotal resection without aggressive attempts at removal of capsule stuck to the cord.
Spinal abscess in children
✓ Clinical presentation may be quite variable.
✓ A 4-phase sequential evolution, in adults, with
  (1) localized spinal pain,
  (2) radicular pain and paraesthesia
  (3) muscular weakness, sensory loss, and sphincter
dysfunction, and finally
  (4) paralysis.
The only presenting symptoms in children are often fever and/or back pain.

The virulence of the infecting organism and the mode of infection contribute to the tempo of this progression.

Abscesses from hematogenous spread tend to progress rapidly, while abscesses from osteomyelitis or discitis may evolve over weeks or months with slow progression of symptoms.
Sources of haematogenous infection
- Skin and soft tissue
- Infected catheter
- Bacterial endocarditis
- Respiratory tract infection
- Urinary tract infection
- Dental abscess
- Others

Sources of contiguous spread
- Vertebral osteomyelitis
- Retropharyngeal abscess
- Dermal sinus tract
- Psoas abscess
- Penetrating injury
- Epidural injections or catheters
Anatomy of spinal abscess

✓ Most abscesses occur posteriorly. An anterior location is often associated with vertebral osteomyelitis.

✓ The most common location for spinal abscesses is in the lumbosacral spine followed by the thoracic and cervical area.

✓ Spread to multiple vertebral levels is common and occurs as the abscess extends up and down the spinal dural sheath. In some cases, this process involves most or all of the spine.
The most common organisms that cause spinal epidural abscess include the following:

- **S aureus** (60%; increasingly often methicillin-resistant *S aureus* [MRSA])
  - Enteric gram-negative bacilli, especially *Escherichia coli* (10%)
  - Coagulase-negative staphylococci (3-5%), primarily involving spinal instrumentation or epidural anesthesia/injections
- **Bacteroides** species and other anaerobes (2%)
- **Pseudomonas** species (2%)
- **Streptococci**, including *Streptococcus viridans*, *group B streptococci*, and *pneumococcus* (10%)
- Mycobacteria, usually *Mycobacterium tuberculosis* (< 1% in Western countries but more common in developing countries)
  - Less-common organisms - *Acinetobacter, enterococci, Actinomyces species, Nocardia species, Brucella species*, and fungi, including *Candida, Coccidioides, Aspergillus, Blastomyces*, and *Sporothrix* species
  - Polymicrobial (possibly 5%-10%)
  - Unknown (6%-10%)
✓ MRI with gadolinium is the superior imaging method for early recognition and localization of spinal abscesses as well as documenting a response to therapy.
✓ Lumbar puncture is contraindicated when the diagnosis of a spinal abscess is being considered.
Spinal abscesses are considered true infectious disease emergencies. Because of the fear of developing permanent neurologic deficits or more severe complications, immediate antibiotic therapy and surgical management remains the standard of care in the management of spinal abscesses. Children with spinal epidural abscesses had more favourable morbidity and mortality outcomes than did adults. The main determinant of outcome for patients with spinal abscess is neurologic status at the time of diagnosis.
Take home message!
Always look for a local cause when you aspirate pus in CSF!