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Manipulated undiagnosed Dermal Sinus leading to Meningitis/Sepsis with Multifocal Brain Abscess (Lesion)

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ABSTRACT

Dermal sinus tract is a very rare entity, which usually comes to clinical attention by cutaneous abnormalities, neurologic deficit, and/or infection [1]. The present study was undertaken to know the clinical profile, differential diagnosis and management of the manipulated undiagnosed dermal sinus leading to meningitis or sepsis with multifocal brain abscesses and discussed associated anomalies and to assess the results of surgical intervention.

Keywords: *Dermal sinus tract, Meningitis, Brain abscess, Sepsis.*

1. INTRODUCTION

Dermal sinus tract which is an epithelium-lined tract from the skin to the spinal cord, cauda equina, or arachnoid and is a rare congenital dysraphism, they are located most frequently in the lumbar and lumbosacral regions. The most common presentations in the emergency department were abnormal skin findings (57.1%) and infection (31.4%). Approximately eight patients presented with meningitis. The overall rate of neurologic abnormalities was 37.1%, four of whom presented acutely with rapidly progressive paraplegia and meningitis. All patients underwent complete resection of the tract and repair of associated abnormalities. Most tracts terminated within the intradural space [2]. Later during embryogenesis, the spinal cord ascends relative to the spinal canal and stretches the adhesion into a long, tubular tract. Dorsal dermal sinus is caused by incomplete separation of the superficial ectoderm from the neural ectoderm, resulting in a focal segmental adhesion. Dorsal dermal sinus manifests as a small dimple or pinpoint ostium, which is often associated with an area of hyperpigmented, angiomatic. Predominantly located in the lumbosacral region and less often in the occipital region. Typical complications are infections such as recurrent meningitis, epidural or subdural abscess, and intramedullary spinal cord abscess.

a) Meningitis

It is an inflammation of the membranes (meninges) surrounding brain and spinal cord. Most cases of meningitis are caused by a viral infection, bacterial and fungal infections are other causes. It can be life-threatening and require emergent antibiotic treatment and appropriate measures. The swelling from meningitis typically triggers symptoms such as headache, fever and a stiff neck. Early treatment of bacterial meningitis can prevent serious complications [3].

b) Epidural abscess

It is a collection of pus between the dura mater and skull. Subdural empyema is a collection of pus between the dura mater and the underlying arachnoid mater. Symptoms of epidural abscess include fever, headache, vomiting, and sometimes lethargy, focal neurologic deficits, seizures, and/or coma [4].

c) Intramedullary spinal cord abscess

It is recognized as rare entity. Dermal sinus tract, which results from the incomplete partition of epithelial ectoderm and neuro ectoderm in the early foetal life, is to be implicated as a source of this pathology in children, it can end anywhere along its tract within the spinal canal compartments and becomes a potential route for spread of infection. Spinal cord abscess may involve any part of the spinal cord but the thoraco-lumbar spine is the most frequent site; however; holocord abscess may occur but it is less common [5].

Abbreviations:

DST-Dermal spinal tract

IV-Intravenous

Inj- Injectables

CBP-Complete blood picture

CUE-Complete urine examination

ABG- Arterial blood gas

CSF- Cerebro spinal fluid

CT- Computed tomography

MRI- Magnetic resonance imaging

GCS- Glass gow coma scale

Bid- Twice daily

SWI-susceptibility weighted imaging

L4- Lumbar vertebral body

H/O-History of

2. CASE REPORT

A 16 year old male patient was presented to emergency department with continuous episodes of convulsions, each episode lasts for 5 min. H/o Abscess over the lumbosacral region with pus discharge since 7 days then one of the patient advisor manipulated it, after 48 hrs patient developed high grade fever with chills and rigor,altered sensorium and he became semiconscious with history of incontinence in urine and stool since two days prior to the admission. On examination patient was semiconscious, GCS score E1V2M3 [6, 7] BP 60 systolic mmHg, Lungs – fine basal crepts were present, Pus discharge was noticed from the ulcer over the lumbosacral region and after thorough dressing tract line was noticed. Initially it was diagnosed as acute meningoencephalitis and sepsis. Immediately patient airway, breathing were protected with advanced airway. Patient treated with Prophylactic Intravenous Antibiotics, antiviral, antimalarial, anti-inflammatory, anti-epileptics, inotropic drugs, intravenous fluid supportive treatment given. MRI investigation showed multiple round heterogeneous signal intense focal lesions in bilateral cerebral parenchyma with perilesional edema, one of the lesion noticed in left thalamus, on T1: Hypo to Hyperintense, on T2: Iso to hyperintense and also hypointensity, on SWI: Multiple blooming areas are noted, it likely due to toxoplasmosis, less likely tuberculomas, MRI lumbar spine showed infected skin tract lesion extending from the L4 vertebral body into spinal cord tract. Test showed negative for blood and urine culture. Pus swab culture showed Candida parapsilosis after second of aerobic incubation. Based on the investigation reports patient treated with antifungal and pyrimethamine therapy and advised CSF culture and analysis, conservative management done about 10 days hospital stay and after recover surgical correction done to dermal sinus tract. Patient discharged after ten days and continued medications with follow up visit.

3. DISCUSSION

a) Pathophysiology

Dermal spinal tract are epithelium lined tracts extending from the skin to the fascia, dura mater, or the central nervous system. They result from abnormal separation of the surface ectoderm from the neuroectoderm resulting in a tract leading from the skin to the CNS. They are usually dorsal midline single and are found in the midline. However, there are reports of lateral, double, or multiple tracts occurring in various locations along the spine [7, 8, 9].They may extending from the skin surface through the various mesodermal layers (fascia, muscle, bone) [10] .In most cases, dermal sinus tracts enter the dura to end within the thecal sac. In the thecal sac, they can attach to the conus medullaris, cauda equina, or filum terminale [11, 12, 13]. The tracts sometime will end in the epidural space or even in the underlying paravertebral soft tissue. Due to the ascent of the conus medullaris during foetal life, the dermal sinus tract's orifice, the tract's point of entry into the dura, and its attachment to the conus are at different levels of the spine. DST can cause a tethered cord syndrome [10] as a result of traction on the conus medullaris. As with other tethering lesions, an associated syringomyelia can exist [13]. Approximately half of all dermal sinus tracts are accompanied by dermoid or epidermoid tumors. These inclusion tumors or cysts usually develop at the termination of the dermal sinus tracts but can occur anywhere along the tract between the skin and the neural tube [10, 13, and 14].

b) Clinical features

Dermal sinus tract was a source of meningitis when it's infected. The clinical symptoms like fever with chills, paraesthesia, altered sensorium, headache, convulsions, urinary incontinence, coma, etc.,

c) Investigations and Results

Complete blood picture (CBP), CUE, blood urea, serum creatine, serum electrolytes, ABG, CT Brain, MRI brain and spine, blood culture, urine culture, pus culture, CSF culture and analysis.



Fig1. Ulcerated abscess over the lumbo sacral region [6]

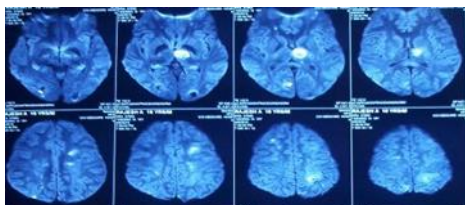


Fig2: MRI of Brain multiple hypo and hyper dense lesion [6]

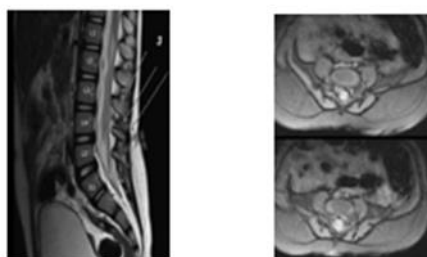


Fig 3. Dermal sinus tract of the spine

d) Differential diagnosis

This case report showed multiple factors involved to confirm final diagnosis. The differential diagnosis of meningitis, encephalitis and formation of infected abscess occurs due to viral meningitis, bacterial meningitis, tuberculoid meningitis, typhus encephalitis, cerebral malaria, Toxoplasmic encephalitis, Fungal meningitis. Detail investigations, csf culture and analysis, MRI investigations plays vital role to conclude final diagnosis.

e) Treatment

Our case report patient presented with continuous episodes of convulsions which are GTCS nature, History of altered sensorium, high grade fever with chills and rigor and vomiting of 5 days duration and recent onset of left eye squint. Immediately patient treated with Inj. Eptoin 15mg /kg body weight was started and Clinical impression at the time of admission was acute intracranial infection so that Inj Ceftriaxone 2gm IV started in 100ml Normal saline given to treat infection. Convulsions were not controlled by Inj Eptoin and he developed status epilepticus and continued with sodium valproate 500mg IV Bid, Inj Levetiracetam 1gm IV stat followed by 500mg IV bid after 2 hrs convulsions came under controlled. Examination of the back revealed the opening of dermal sinus tract and a surrounding flat erythematous skin pigmentation in the lumbosacral region with pus discharge oozing out. The initial CT scan of the brain showed space occupied granulomatous lesion, Inj Dexamethasone and mannitol was started to reduce perilesional edema and CSF analysis was suggestive of pyogenic meningitis and few yeast cells. (more than 100 WBC/HPF, neutrophils – 96%, lymphocytes - 4%, proteins – 441mg/dl, sugar - 2mg/dl, chloride 109mmol/l). Pending CSF culture, he was started on ceftriaxone and vancomycin. Vancomycin was added to cover gram-positive organisms in view of the DST. CSF culture grew extended spectrum beta lactamase of Escheria coli, few yeast cells Candida parapsilosis and parasite toxoplasmosis was present. Over the next 48 hrs his sensorium not improved and a MRI of the brain was done, which showed multiple round heterogenous signal intense focal lesions in bilateral cerebral parenchyma with perilesional edema, one of the lesion noticed in left thalamus, on T1: hypo to hyperintense, on T2: iso to hyperintense and also hypointensity, on SWI: Multiple blooming areas are noted, it likely due to toxoplasmosis, tuberculomas,. On MRI lumbar spine showed infected skin tract lesion extending from the L4 vertebral body into spinal cord. Negative for blood and urine culture Pus swab culture showed Candida parapsilosis after 2nd of aerobic incubation. Based on the investigation reports patient treated with antifungal fluconazole 100ml and pyrimethamine 50mg, vancomycin and ceftriaxone replaced with clindamycin 600mg iv bid and Meropenem 1gm in therapy. Patient undergone septic shock and treated with inotropes like nor adrenaline, intravenous fluid therapy. Patient recovered from altered sensorium, meningitis symptoms and size of the lesions were reduced after 10 days of aggressive therapy. Treatment of these lesions consists of excision of the dimple and the tract all the way upto termination in the intradural compartment as dermoid abscess done. Later patient was

discharged, continued medications like anti epileptics, antibiotics, antifungal, pyramethamine about two weeks and advised follow up visit.

4. CONCLUSION

The diagnosis of a spinal DST should prompt radiological evaluation and surgical intervention. Surgery is warranted in DST even if the patient is asymptomatic. At surgery, the tract should be followed intradurally, and the associated dermoid lesion should be excised. In this case it was manipulated undiagnosed dermal sinus leading to meningitis/sepsis with multifocal brain abscesses. Hence early detection of dermal sinus in childhood and surgical intervention prevents the meningitis.

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