

CASE REPORT

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Longitudinally Extensive Transverse Myelitis (Letm) In a Patient with Post Dengue Fever Spondylodiscitis & Epidural Abscess

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ABSTRACT

A change in manifestation is observed over years with dengue viral infections. There is neural predilection for dengue virus and documented evidence is available for immunosuppression due to dengue virus infection in mice. Here we report a case of post dengue fever longitudinally extending transverse myelitis (LETM) associated with spondylodiscitis and epidural abscess due to MRSA in a 71 year old male. This is the 13th case with LETM following dengue virus infection and first case of LETM associated with post dengue fever, spondylodiscitis and epidural abscess. The patient developed LETM epidural abscess and spondylodiscitis 4 weeks after he was diagnosed to have dengue fever with NS1 antigen positivity.

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Introduction

Transverse myelitis is diagnosed with a sudden onset of sensory motor and sphincter disturbances resulting from inflammatory demyelinating lesions. In longitudinally extensive transverse myelitis, three or more vertebral segments are involved. Transverse myelitis can be classified into four categories, i.e. demyelination, combined systemic connective tissue disease, infection and idiopathic. Treatment with intravenous steroids is useful and patients with parainfectious dengue or immune mediated demyelination shows good recovery [1].

Dengue is the fastest spreading arboviral illness in the world. Four different serotypes of dengue virus, DENV 1, 2, 3, & 4 causing asymptomatic fever to severe hemorrhagic fever. Dengue is prevalent in 128 countries. *Aedes aegypti*, *Ae. albopictus*, *Ae. polynesiensis*, & several species of *Ae. scutellaris* complex are the vectors for dengue infection [2]. Neurological signs were first reported as atypical symptoms of dengue infection with a varying incidence of 0.5%-20% in recent years. Current evidence support the notion that dengue virus is neurovirulent and is isolated from CSF and the central nervous system [1]. Neurological manifestation of dengue may vary considerably. No more than 12 case reports are available in the literature with TM/LETM secondary to dengue viral infection varied over years. In 2017, we had a few patients with epidural abscess with or without spondylodiscitis about 6 weeks post dengue fever. Among these are one patient with epidural abscess and spondylodiscitis at C5-6 & C6-7 developed LETM one day after surgical exploration for drainage of the abscess. Similar cases are not reported in the literature to the best of my knowledge.

Case Report

A 71 year old male was treated symptomatically after being tested positive for NS1 antigen. He developed acute onset neck pain and tingling and numbness of his fingers of both upper limbs, four weeks later. His hand grip was reduced bilaterally (grade 3 MRC grading) and sensory blunting over C5,6,7 dermatomes in both his upper limbs. His higher mental functions were normal. He was evaluated. His blood parameters were Hb - 10.3 gm%, total count 15,400, ESR 120 mm/1st hr, CRP(C-reactive protein)-227, serum ferritin-465.51. Blood culture grew MRSA at admission. MRI of the cervical spine showed C5-6 discitis with epidural abscess compressing the spinal cord at C5-6 & C6-7 levels. Paravertebral and prevertebral collections extended from C3-T1.



Figure 1

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He was treated surgically by C5-6 discectomy, abscess drainage and C5-6 interbody fusion with tricortical iliac crest graft through an anterior approach. Pus culture grew MRSA. Histopathological examination showed sheets of neutrophils, mixed with macrophages and lymphocytes. He was put on Piperacillin - Tazobactam injection according to culture and sensitivity reports. 24 hours after the surgery the patient neurological status started deteriorating. He became quadriplegic (Frankel Grade B) with only preserved sensations over his body overnight. A repeat MRI of the cervical spine showed altered signal changes in the spinal cord extending from C3-D2 level along with epidural collection from C4-D1 levels.



Figure 2

Diffusion weighted MRI of the cervical spine also showed altered bright signals in the cervical spine and cord. It may be due to demyelination resulting in longitudinally extending transverse myelitis (LETM) secondary to dengue virus infection. Neuromedicine consultation was sought. Then, anti-dengue antiglobulin was given. The next day the patient was taken back to the theater again as the MRI showed increase in abscess size and C6-7 discitis. C6-7 discectomy and drainage of the abscess was done. Anterior C6-7 interbody fusion done with iliac crest graft without instrumentation. Culture and sensitivity reported MRSA sensitive to teicoplanin. Histopathological examination showed acute suppurative inflammation along with degenerative changes. He was put on inj teicoplanin 600 mg subcutaneously once daily along with cap Rifampicin 450 mg once daily (based on culture and sensitivity reports). He was given physiotherapy for his limbs and body along with this. He was an in patient for one month. His neurological status gradually improved. Inj Teicoplanin and cap Rifampicin were continued for 6 weeks. At discharge his blood parameters improved to CRP-30, total count 10,500, ESR 110 mm/1st hr. Blood culture was negative and serum ferritin level became normal.

Hb	TC	ESR	CRP	S. Ferritin	Blood culture
At admission	10.3	15,400	120	227	465.51 MRSA
At Discharge	11.6	10,500	110	30	150

At three months he was able to walk independently. His neurological recovery was not complete at that time. He has been under constant follow-up since then. In January 2020 he has complete neurological recovery.



Figure 3

He is leading an independent life and also does heavy jobs like plantation activities in his field.

Discussion

There is a change in manifestation of dengue virus infection over years. This pandemic disease caused by dengue virus affects about 390 million people every year and 96 million manifest clinically [3]. Dengue has many unusual presentations [4]. Some authors state that these unusual presentations are due to concurrent infections caused by fungi, bacteria or protozoa of late [5-7]. Clinical reports have been emerging on the possible neurological complications associated with dengue [8]. Rhabdomyolysis, fulminant liver failure, acute renal failure, myocarditis, transverse myelitis, encephalopathy, Guillain-Barre syndrome are unusual presentations [8]. Associated bacterial infection is considered of fever goes beyond 7 days along with elevated ESR and C-reactive protein [9]. The neuropathogens of dengue infection is not very well understood [10]. It may be due to the virus itself or due to post infectious immune mediated injury [10]. A study shows that post infectious onset of flaccid paraplegia can be a direct invasion of the virus where as late onset neurological deficit can be due to immune mediated injury [10]. Dengue virus has shown to reduce cell mediated immunity in mice by different mechanisms [11]. There is no recorded data available as of now on the incidence of epidural abscess in patients who have dengue fever.

The present case shows spondylodiscitis and epidural abscess with mild neurological deficit in a 71 year old male 4 weeks after he was tested positive for dengue with NS1 antigen positivity. He was symptomatically treated at that time. The occurrence of spondylodiscitis and epidural abscess with MRSA 4 weeks later indicate secondary infection following immunosuppression with dengue virus infection [12]. The occurrence of LETM may be due to immune mediated injury to the cord following dengue infection. He has improved completely, clinically as well as radiologically following treatment with anti-dengue immunoglobulin and culture sensitive antibiotics to the secondary infecting agents namely MRSA. Only 12 cases are reported as TM/LETM following dengue infection This may be the 13th case of LETM after dengue virus infection.

1	Renganthan et al	1996
2	Leao et al	2002
3	Kunishige et al	2004
4	Seet et al	2006
5	Chantamath & Sathirapanga	2010
6	Verma et al	2011
7	Lanik et al	2012
8	Singh et al	2013
9	Veeratunghe et al	2014
10	Jong et al	2016
11	Mo et al	2016
12	Mota et al	2017
13	Suresh S. Pillai et al	2017(2020)

Here the case is unique that it is not an isolated incidence of LETM, but it has happened along with spondylodiscitis and epidural abscess in the cervical spine which is a rare occurrence. It is the first case to be reported with a similar combination to the best of my knowledge. It is worthwhile to notice that the patient had a complete neurological recovery from a flaccid quadriplegic state. This may be due to prompt and timely intervention or it may be attributable to peculiarity of dengue viral immune mediated infection. This opens a new horizon for further research.

Conclusion

Dengue (an arbovirus) infection is a pandemic. Currently the only measure to control the disease is through vector control. Different Aedes mosquitoes act as carriers. The Aedes albopictus is suitable even in temperate climates making routes to these countries also. Vaccine strategies also did not find any definite solution.

None of the anti-virals are effective against dengue. The only method of treatment is symptomatic and supportive. Transverse myelitis longitudinally extensive transverse myelitis (LETM) is a rare occurrence following dengue fever. Only 12 cases are reported so far. But LETM associated with post dengue fever, spondylodiscitis and epidural abscess is first of its kind being reported. The excellent neurological recovery following complete flaccid quadriplegia due to post dengue LETM opens a new horizon for further research.

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