JOURNAL OF NEPALESE SOCIETY OF CRITICAL CARE MEDICINE
A PEER REVIEWED, OFFICIAL JOURNAL OF NSCCM

CLINICAL IMAGE

Double doughnut sign in dengue encephalitis

Sachit Sharma, M.D., D.M., Gentle Sunder Shrestha, M.D.

Department of Critical Care Medicine, Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu, Nepal

Corresponding author:
Dr. Sachit Sharma
MD, DM in Critical Care Medicine
Clinical Lecturer, Department of Critical Care Medicine
Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu, Nepal
Consultant in Critical Care Medicine
Upendra Devkota Memorial National Institute of Neurological and Allied sciences, Bansbari, Kathmandu, Nepal
Email: sachitrupakhetee@gmail.com
Phone: 977-9852049450

ACCESS THIS ARTICLE ONLINE

View PDF

HOW TO CITE THIS ARTICLE IN VANCOUVER STYLE?

Sharma S, Shrestha GS. Double doughnut sign in dengue encephalitis. Journal of Nepalese Society of Critical Care Medicine. 2023 Jan;1(1):26-27.

Submitted	: 21 Nov 2022
Accepted	: 22 Nov 2022
Published Online	: 2 Dec 2022
Conflict of Interest	: None
Source of Support	: None

Key words: *dengue encephalitis, double doughnut sign.*

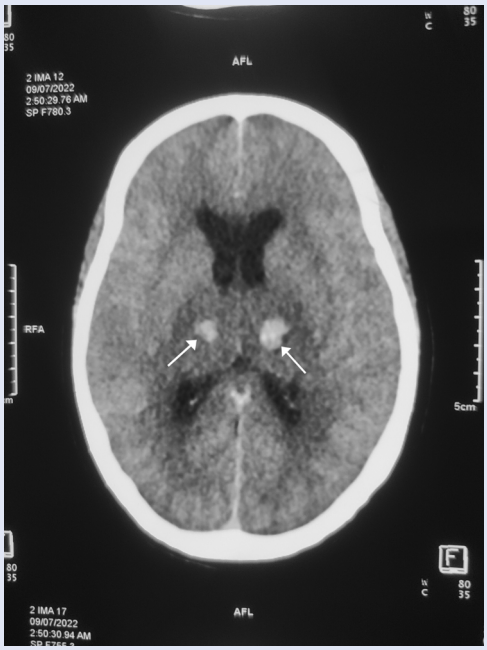

Figure A: Arrowheads indicating hyperdense lesion surrounded by hypodensity involving bilateral thalamus and basal ganglia regions (Double Doughnut sign) suggestive of Dengue encephalitis.

A 38 year old female with no known co-morbidities presented with the complaints of fever, abdominal pain and altered consciousness of 4 days duration. At presentation, her GCS was 7/15; eye opening to pain, flexor response to pain and incomprehensible sounds. Her vitals were stable with a SpO_2 of 92% with O_2 via nasal cannula at 2 L/min, blood pressure 110/70 mmHg, heart rate 100/min and temperature 99 degree Fahrenheit. Petechial rashes were present over multiple areas of the body. In the background of a low GCS score, the patient was intubated. Plain CT scan of head (Fig A) revealed hyperdense lesion surrounded by hypodensity involving bilateral thalamus and basal ganglia regions. Patient had leukopenia and thrombocytopenia (3,800/cu mm and 40,000/cu mm respectively) and elevated liver enzymes (ALT/AST- 120/86 IU/L). The patient tested positive for Dengue IgM antibody, Dengue IgG antibody and NS1 antigen. Evaluation for other tropical infections including Scrub typhus, Leptospirosis, Malaria, Brucellosis and Japanese encephalitis were negative. Lumbar puncture was performed which revealed total white cell

counts of 10 with 20% neutrophils and 80% lymphocytes, sugar of 50 mg/dl and protein of 90 mg/dl. A diagnosis of dengue encephalitis was made and supportive treatment was initiated. Viral isolation in CSF could not be performed because of unavailability of the test. The patient gradually deteriorated over the next three days and finally succumbed on the fourth day of ICU admission because of refractory septic shock.

Neurologic complications of dengue fever include encephalopathy, encephalitis, Guillain-Barre syndrome, transverse myelitis, and neuromuscular disorders.[1] In our patient, acute febrile illness with encephalopathy, positive dengue IgM serology, suggestive lumbar puncture findings and exclusion of differentials satisfied the diagnostic criteria of dengue encephalitis.[2] Various pathogenic mechanisms have been implicated for these complications which include direct viral invasion, systemic inflammatory response, and immune-mediated mechanisms. Dengue virus inflicts direct neuronal injury leading to cerebral edema and hemorrhage secondary to vascular leak, which usually involves bilateral basal ganglia and thalamus complex and manifests neuro-radiologically as "double-doughnut" sign.[3] This imaging finding is unique to dengue encephalitis and is rarely seen in other central nervous system infections.

REFERENCES

1. Carod-Artal FJ, Wichmann O, Farrar J, Gascón J. Neurological complications of dengue virus infection. Lancet Neurol. 2013 Sep;12(9):906–19. [PubMed | Google Scholar | DOI]
2. Cristiane S, Marzia P-S. Diagnosis criteria of dengue encephalitis. Vol. 72, Arquivos de neuro-psiquiatria. Germany; 2014. p. 263.
3. Jugpal TS, Dixit R, Garg A, Gupta S, Jain V, Patel R, et al. Spectrum of findings on magnetic resonance imaging of the brain in patients with neurological manifestations of dengue fever. Radiol Bras. 2017;50(5):285–90. [PubMed | Google Scholar | DOI]