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Case Report

Role of Early Tracheostomy in a Case of Guillain–Barre Syndrome in ICU

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ABSTRACT

Background: Guillain–Barré syndrome (GBS) is an acute immune-mediated polyradiculoneuropathy characterized by progressive, symmetrical weakness and areflexia. Up to 30% of patients develop respiratory failure requiring mechanical ventilation. Prolonged intubation poses risks such as laryngeal injury, tracheomalacia, and pneumonia. While tracheostomy is typically considered after two weeks of ventilation, early tracheostomy may offer clinical benefits in selected patients.

Case Presentation: A 28-year-old male with no significant comorbidities presented with fever followed by rapidly progressive quadriparesis and facial weakness. Neurological examination revealed global areflexia with preserved sensations. MRI of the brain and spine was normal. He was diagnosed with GBS and commenced on intravenous immunoglobulin therapy. On the day of admission, he developed respiratory distress requiring intubation and mechanical ventilation. Chest imaging showed right-sided collapse–consolidation, and bronchoscopy revealed mucus plugging, which was cleared. Anticipating prolonged ventilation, an elective tracheostomy with a cuffed Portex tube was performed on day seven. Supportive care included antibiotics, thromboprophylaxis, and intensive physiotherapy. Despite intermittent fever with sterile cultures, gradual neurological recovery permitted ventilator weaning. On day 25, the Portex tube was replaced with a Fuller's metal tracheostomy tube. By day 45, the patient tolerated spigotting, and decannulation was achieved on day 47.

Discussion: GBS can progress rapidly to respiratory failure, necessitating prolonged ventilatory support. Early tracheostomy offers advantages such as improved secretion clearance, reduced airway resistance, decreased sedation requirements, and facilitation of physiotherapy. Literature remains divided regarding timing: while some advocate delaying until two weeks to reduce tracheal complications, others report earlier autonomy and improved tolerance with early intervention. Prediction tools and electrophysiological markers may help identify candidates for early tracheostomy.

Conclusion: This case demonstrates that early elective tracheostomy (within seven days) in GBS with severe respiratory involvement can enhance ventilation, aid weaning, and contribute to favorable outcomes. Individualized decision-making, guided by clinical severity and risk assessment, is essential.

Keywords*: Tracheostomy, Guillain–Barre, ICU, inflammatory,Elective ventilation.*

INTRODUCTION

Guillain-Barré syndrome (GBS) is a rapidly progressing inflammatory polyradiculoneuropathy with varied presentation and pathogenesis [1]. Diagnosis is based on clinical and electrophysiological findings, supported by cerebrospinal fluid analysis. Respiratory insufficiency, affecting 20-30% of patients, is a life-threatening complication associated with poor outcomes. Weakness of the respiratory and bulbar muscles can lead to respiratory failure, hypoxemia, hypercapnia, and aspiration pneumonia. Mechanical ventilation (MV) is often necessary in severe cases. Early recognition of high

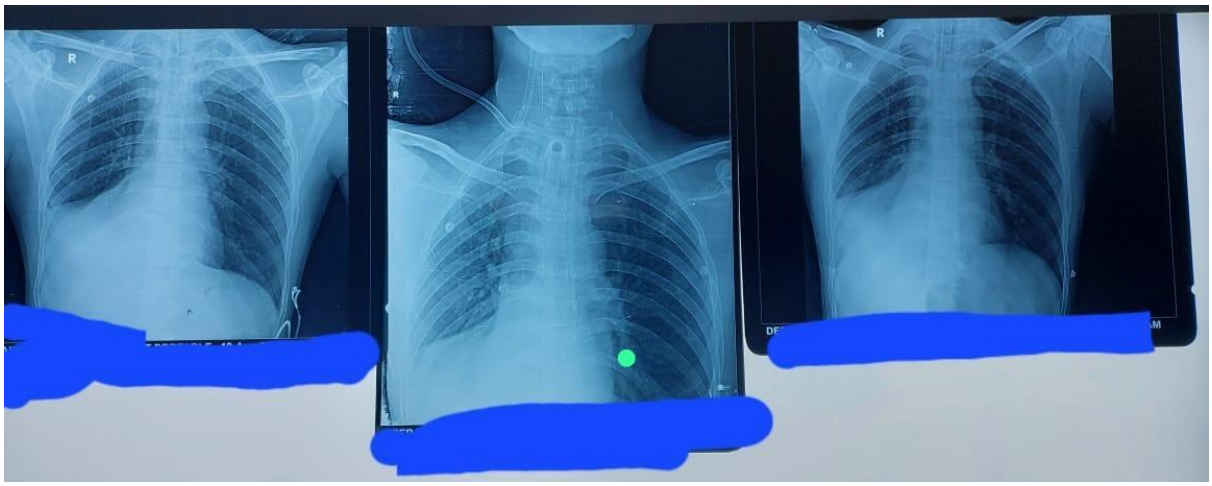
respiratory failure risk is crucial for appropriate patient triage [2,3]. MV should be initiated when patients meet respiratory failure criteria, with severe signs such as bulbar weakness and dysautonomia. Immunotherapy (IVIG or plasmapheresis) [4] and supportive care are critical, but challenges remain in determining the timing of MV initiation, weaning strategies, and when to perform a tracheostomy. A tracheostomy is usually done when the need for mechanical ventilation exceeds day 14. [5,6] In this case report of Guillain barre syndrome in which early tracheostomy (within seven days) was done.

CASE PRESENTATION

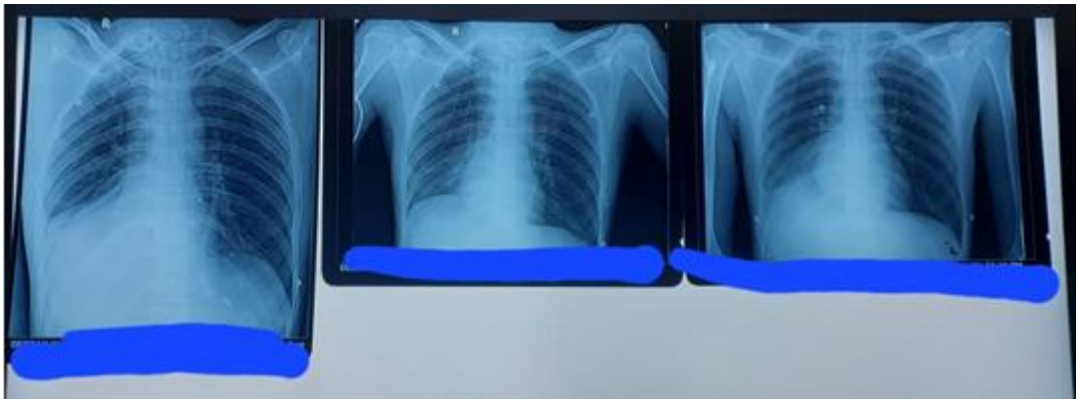
A 28-year-old man, with no significant past medical history, presented to the emergency department for evaluation of fever progressive quadriparesis predominantly involving face was grade ⅕, lower extremity weakness (MRC grade ⅘, upper extremity weakness ⅖ proximally and 3/5 distally) and global areflexia were noted. Light touch, temperature, and vibration sensations were normal. He had the history of fever for 4 days and a feeling of weakness in his upper and lower extremities. He had been unable to complete his routine workout but could still ambulate independently. On the day of presentation his weakness progressed to the point that he was unable to get out of bed with breathing difficulty, necessitating an emergency evaluation.

In-hospital evaluation

MRI spine and brain were normal. He was diagnosed with GBS and IV Ig therapy was initiated. He developed progressive respiratory distress requiring intubation and mechanical ventilation on the day of admission. Patient had right > left lung collapse and consolidation. Pulmonologist opinion was obtained and a bronchoscopy was done that showed thick mucus plug obstructing bronchial tree, and toileting was done. Bronchial fluid aspirate was sent for culture. Considering that he may require prolonged mechanical ventilation an elective tracheostomy with Porte seven-size cuffed tube was done on the 7thday of admission. Post-tracheostomy supportive care was given. Started on antibiotics and DVT prophylaxis. Aggressive physiotherapy was done. High-grade fever spikes persisted; tracheal and urine cultures were normal. After weaning the patient from mechanical ventilation and recovering the respiratory paralysis, the portex tracheostomy tube was changed into Fuller's metal tracheostomy tube on the 25th day. On the 45th day of weaning the Tracheostomy tube, spigotting was well tolerated and maintained saturation on air, and the tracheostomy tube was removed on the 47th day.



Prebronchoscopy cxr



Post bronchoscopy cxr

DISCUSSION

Guillain-Barré syndrome (GBS) is a rapidly progressing, predominantly motor, symmetric polyradiculopathy that typically ascends from the lower extremities and may lead to bulbar and respiratory failure[7]. Subtypes of GBS include acute inflammatory demyelinating polyneuropathy (AIDP), acute motor axonal neuropathy (AMAN), acute motor and sensory axonal neuropathy (AMSAN), and Miller-Fisher syndrome[8]. Immunomodulatory therapies, such as intravenous immunoglobulins (IVIG) and plasma exchange, have demonstrated efficacy in reversing neural dysfunction(9,13). Until these therapies take effect, supportive measures—particularly mechanical ventilation and physiotherapy—are crucial.In cases requiring mechanical ventilation, tracheostomy plays a vital role in providing

prolonged and effective respiratory support [8]. However, the optimal timing of tracheostomy remains a point of contention. Delaying tracheostomy may result in complications such as vocal cord damage, laryngeal muscle dysfunction, and recurrent laryngeal nerve paralysis. Tracheostomy might facilitate weaning by reducing dead space and decreasing airway resistance, improving secretion clearance, reducing the need for sedation, and decreasing the risk of aspiration [11-14]. many studies and their literature have been reviewed which are as following:

- Lawn et al.,[2] showed that unexcitable nerves by electrical stimulation required prolonged MV.
- Durand et al.,[3] reported that AIDP was associated with a higher chance of respiratory failure.
- Walgaard et al.,[14] have developed a prediction tool for selecting patients among the patients receiving mechanical ventilation for early tracheostomy.
- Wijdicks et al.,[11] has reported that tracheostomy has strongly recommended for two weeks to avoid tracheomalacia and post-intubation stenosis.
- Nieszkowska A et al.,[4] conclude that tracheotomized mechanically ventilated ICU patients required less intravenous sedative administration, spent less time heavily sedated, and achieved more autonomy earlier.
- Terragni pp et al.,[5] showed Among mechanically ventilated adult ICU patients, early tracheotomy compared with late tracheotomy did not result in statistically significant improvement in incidence of ventilator-associated pneumonia.

CONCLUSION

Early tracheostomy (within seven days) may be beneficial in cases of Guillain-Barré syndrome with respiratory failure, as it can provide more effective ventilation and promote better recovery. Given the highly variable duration of mechanical ventilation in these patients, early intervention may help improve outcomes

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