Mobilization of Patients with External Ventriculostomy Drains: Pro and Cons

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The effects of prolonged immobilization in the critical patient have been well described. Patients on mechanical ventilation and patients receiving extracorporeal membrane oxygenation therapy have been presented as evidence of the feasibility of implementation of early mobilization protocols. Prolonged immobilization of critically ill patients has been associated with intensive care unit-acquired weakness syndrome, increased mortality, at the cognitive level, impact on quality, and cost increase among other considerations. Early mobilization emphasizes strategies to stimulate motor, sensory, and proprioceptive levels in the context of critically ill patients. Early mobility intervention in critically ill patients begins in the first days of stay in the unit and requires a scheduled combination of passive and active activities. The presence of an external ventriculostomy device is not a contraindication for mobilization. It helps as above with the progression and improvement in the outcome. The dislodgement and risk of fracture of external ventricular drainage (EVD) are major concerns. Here, we briefly go over the technical aspect of EVD placement and how to safely mobilize the patient.

Most of the EVDs are placed in the operating rooms, while some are in the intensive care. While placement is a closely controlled procedure, certain features help with the security of the device and hence early mobilization. After all, incisions are closed, and stitches with 3-0 nylon stitches are used. The ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk. The exiting ventriculostomy catheter itself should be tunneled at least 4 to 5 cm from the entry site to decrease infection risk.

The limitation of ambulation and activity with EVD is related to the device, the patient’s condition, and the limitation of resources. The biggest limitation is the device itself. There are multiple connections in EVD and any one of these can be loose or get disconnected. A disconnected EVD leads to infection risk and requires another procedure to replace the EVD. Patient condition, especially related to high output EVD and unstable neurological status, leads to delay or difficult situation to

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increasing the activity. EVD cannot be clamped during these changes and a close watch is required if any activity is done while keeping EVD opening. A system like LiquoGuard (MollerMedical GmbH), with continuous control of CSF drainage rather the gravity, can help in this matter. A protocol implementation requires resources and some intensive care units do not have all the key functional elements like a daily physical therapist, nursing staff, and respiratory therapist to proceed with ambulation and activity.

In conclusion, early and protocol-driven ambulation in intensive care with an EVD is a safe and effective therapy. A team effort is required including proper surgical placed EVD, early consultation with the physical therapy, nurse-driven oversite, and physician directed supervision. A daily review of activity in patients with EVD should be part of the bedside communication tool. There are limitations with early ambulation of stable intensive care patients with EVD. The risk of disconnection or dislodgement can set back the progress and the patient can go from stable to unstable status.

Informed Consent
Verbal and written consent was obtained.

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All the authors have contributed equally to the manuscript.

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