Restoring Functional Mobility in a Patient with Delayed Onset of Physical Rehabilitation Following a Hemorrhagic Stroke: A Case Report

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Unique

• Typical rehabilitation post-stroke is initiated as soon as the patient is medically stable.
• The most dramatic neurological recovery occurs within the first three to six months following medical stabilization.1
• It has been suggested in the literature that early and frequent out of bed activity within the first 24 hours following stroke onset will enhance motor recovery.2
• The patient in this case report was sedentary for three months following the onset of stroke and was non-ambulatory at the time of admission to sub-acute physical therapy.

Purpose

• The purpose of this case report is to describe the rehabilitative course, motor recovery, and functional gains for a patient who received delayed rehabilitation following a hemorrhagic stroke.
• This procedure reduces the risk of mortality and minimize disability until the intracranial pressure has returned to normal.4

Foundation

• Hemorrhagic strokes account for only 10% to 15% of initial strokes, and are responsible for 35% to 50% of terminal strokes.2
• Hemorrhagic strokes have been shown to result in greater disability and higher risk of mortality compared to ischemic strokes.
• Due to the severity of the patient’s stroke, a delay to rehabilitation was performed.
• It is possible that improved outcomes and increased level of independence were a result of the timing of rest, return to activity and the initiation of physical rehabilitation following stroke in order to regain optimal functional activity.6

Description

• The patient was a 54-year-old female that had an intracranial hemorrhage, subsequent decompressive craniotomy and a follow-up cranioplasty.
• Sub-acute physical therapy occurred six days a week for 45-60 minute sessions over the course of 10 weeks.
• Interventions consisted of therapeutic exercises, therapeutic activities, mobility training, and neuromuscular re-education.

Objective Data upon Admission

<table>
<thead>
<tr>
<th>Objective Measures</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Behaviors</td>
<td>Impulsive</td>
</tr>
<tr>
<td>Cognition</td>
<td>A&amp;O x3; impaired cognition; impaired attention span; impaired spatial orientation and kinesesthetic awareness; L-sided neglect</td>
</tr>
<tr>
<td>Strength</td>
<td>LLE: 0/5 strength; flaccid; moderate subluxation at L shoulder</td>
</tr>
<tr>
<td>LLE: 3/5 strength</td>
<td></td>
</tr>
<tr>
<td>Coordination</td>
<td>Gross &amp; fine motor coordination impaired on the left side of body</td>
</tr>
<tr>
<td>Posture (at static stance)</td>
<td>Moderate left pelvic and trunk rotation; left weight shift; disorientation of neutral head position; unbalanced center of mass</td>
</tr>
<tr>
<td>Activity tolerance</td>
<td>Increased fatigue with activity; extended break time</td>
</tr>
<tr>
<td>Balance</td>
<td>Static sitting: Mild left weight shift; neglect of left upper extremity</td>
</tr>
<tr>
<td></td>
<td>Static standing: Moderate left weight shift; moderate assistance to maintain position</td>
</tr>
<tr>
<td>Pain</td>
<td>No pain reported</td>
</tr>
</tbody>
</table>

Interventions

Therapeutic Activities

- Supine: glut squeezes; ankle pumps; heel slides; hip ABD; SLR; bridging; quad sets; resisted DF; sidelying clamshells
- Sitting: marches; hip ABD; hip ABD ball squeezes; long arm quad
- Standing: marches; 4-way hip motions; mini-squats; terminal knee extensions
- Bed mobility: rolling L & R; supine <x>sidelying; supine<><x>side-lying
- Transfers: sit<><=stand; bed<><=WC; WC<><=stand; WC<><=standard chair; SPT<><=WC<><=toilet

Therapeutic Training

- Gait training: within parallel bars > using WBRC > using wall rail > using SFC
- Stair training: 4 stairs > 8 stairs > 10-20 standard stairs (all using R handrail)
- Patient education: weight distribution; weight shifting; LE placement; proper sequencing; forward eye gaze
- Sitting balance (feet on ground): RUE support > no UE support > weight shifting in all directions > reaching
- Standing balance: RUE support > no UE support > ballon tag > reaching for cones at various angles > NBS > tandem stance > SLS
- Dynamic standing balance with therapeutic exercises

Neuromuscular Re-education

- Sitting: with head supported in various positions

Observations

<table>
<thead>
<tr>
<th>Functional Outcome Measures</th>
<th>Week 1 Examination</th>
<th>Week 4</th>
<th>Week 7</th>
<th>Week 10 Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBI</td>
<td>60/100</td>
<td>----</td>
<td>----</td>
<td>86/100</td>
</tr>
<tr>
<td>PPME</td>
<td>1/12</td>
<td>0/12</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>30-second Chair Rise</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Gait Speed</td>
<td>0.13 m/s WBRC, 5</td>
<td>0.13 m/s WBRC, 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Level of Independence for Functional Mobility

Figure 1 represents the patient's functional level at the time of initial examination and again at discharge. 100% indicates independent; 90% modified-independent; 0% unable to perform.

Conclusion

• The patient progressed from a dependent functional state to a supervised to independent level of function.
• Despite the severity and chronicity of her functional impairments post-stroke, functional gains were noted over the course of care.
• It is possible that improved outcomes and increased level of independence were a result of the consistency and gradual progression of interventions.
• Limited data is available describing the outcomes of individuals who do not receive rehabilitative care within the first few days following stroke onset, but instead receive delayed physical rehabilitation.
• Future research should investigate the optimal timing of rest, return to activity and the initiation of physical rehabilitation following stroke in order to regain optimal functional activity.

References