

Differences in Pre-rehabilitation and Post-rehabilitation Techniques for A Patient with Halo-gravity Traction and Subsequent Spinal Fusion: A Case Study

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BACKGROUND & PURPOSE

Scoliosis, a curvature of the spine, often leaves individuals with compromised musculoskeletal and pulmonary function. Depending on the severity of scoliosis and comorbidities, patients may require surgical intervention. Halo-gravity traction is a safe and effective intervention to maximize pulmonary function and decrease the risk of neurologic injury by gradually correcting spinal deformity pre-operatively.¹ The purpose of this case study is to highlight the differences between pre-operative and post-operative rehabilitation techniques for a patient requiring Halo-gravity traction preceding a total spinal reconstruction and fusion.

CASE DESCRIPTION

Patient Background:

- ❖ 49 year old female
- ❖ Independent at baseline
- ❖ Speech Language Pathologist

Plan of Care: Halo-gravity traction greater than 50% of her body weight for one month preceding total spinal reconstruction and fusion

Past Medical History:

- ❖ Severe symptomatic scoliosis
- ❖ Breast cancer survivor
- ❖ Osteogenesis Imperfecta (Type I, self-reported)

BARRIERS

Emotional:

- ❖ Patient self-conscious about halo appearance
- ❖ Drastic difference in functional capacities pre- and post-operation

Psychological:

- ❖ Underestimated post-op recovery process

Medical (post-op):

- ❖ Pain
- ❖ Blood loss (8 units PRBC; 6 unit PLT)→ orthostatic hypotension
- ❖ 4 day ICU stay (3 Failed SBTs)

PRE-OPERATIVE

Therapy Goal: Maintain functional independence while improving strength and pulmonary function

Patient Stated Goal: “To get stronger”

Functional Performance: Independent in ADLs and functional mobility without assistive device

Therapeutic Techniques: Respiratory games (balloons, bubble art, cotton ball races), high level complex tasks (ie: balloon tennis, scavenger hunts, dancing), and endurance activities (treadmill, upper body ergometer, distance walking)



POST-OPERATIVE

Therapy Goal: Re-learning basic activities of daily living (ADLs) and retraining functional mobility

Patient Stated Goal: “Be able to walk”

Functional Performance: Bed mobility ModerateA x2 → MinA x1

Functional transfers/mobility MinA x2→ MinA x1 with RW

ADLs MaxA → MinA with adaptive equipment and techniques

Therapeutic Techniques: Standard acute care techniques to address bed mobility, functional mobility, and ADL retraining while maintaining post-op spinal precautions

CONCLUSION

This case study reinforces the importance of comprehensive and individualized pre- and post- rehabilitative care for patients undergoing Halo-gravity traction preceding corrective spinal surgery. As therapists, it is important to be able to navigate the differences in pre- and post- operative therapeutic approaches in order to achieve therapeutic goals and optimize functional performance within the patient’s given constraints. It is imperative that therapists acknowledge the patient’s medical and psychological barriers across the therapeutic course of care.

REFERENCES

¹Bogunovic, L., Lenke, L. G., Bridwell, K. H., & Luhmann, S. J. (2013). Preoperative halo-gravity traction for severe pediatric spinal deformity: complications, radiographic correction and changes in pulmonary function. Spine deformity, 1(1), 33-39.

