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Virtual Postoperative Rehabilitation after Facial Reanimation Surgery

Mini Review

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Purpose and Objectives

To develop a standardized post-operative virtual rehabilitation program available to Atlantic Canadians following dual nerve transfer surgery/facial reanimation surgery. To report patient satisfaction outcomes associated with virtual rehabilitation following dual nerve transfer surgery.

Background

Facial nerve (CN VII) weakness has wide etiology including ischemic, inflammatory, viral, traumatic and idiopathic causes with incidence rates of 11-53 per 100,000 [1]. Individuals with facial nerve weakness report difficulties with chewing, speech and general motor function as well as psychosocial and cosmetic implications of altered appearance [2- 4].

For individuals who have ongoing issues with facial nerve paralysis, surgical management in the form of a dual nerve transfer surgery is performed. The dual nerve transfer involves the combined transfer of masseteric and hypoglossal nerve fibres to the facial nerve, to restore facial movement and muscle tone [5] Figure 1.

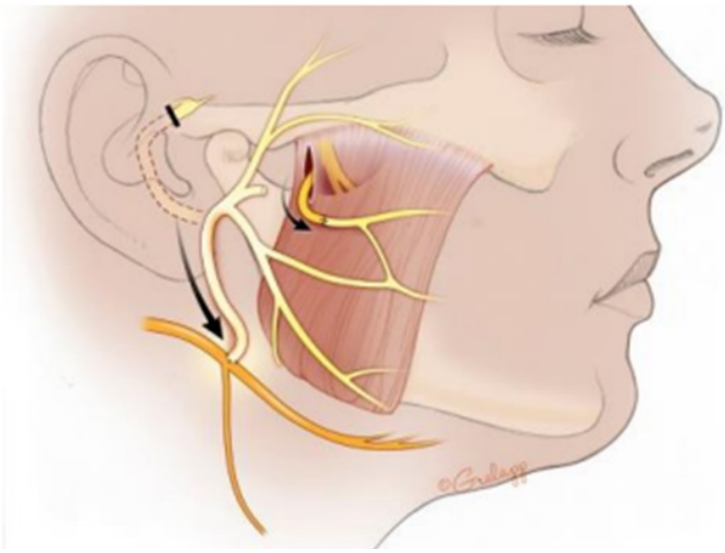


Figure 1: Animation of procedure for dual nerve transfer surgery.

Due to the reorganization of nerve fibres to facial muscles, individuals undergoing this surgery require post-operative physiotherapy to re-learn facial movements including smiling. The current method for post-operative rehabilitation involves the patient spending time in front of the mirror to learn 2 rehabilitation exercises with the operating surgeon.

Many limitations to current physiotherapy following dual nerve transfer exist:

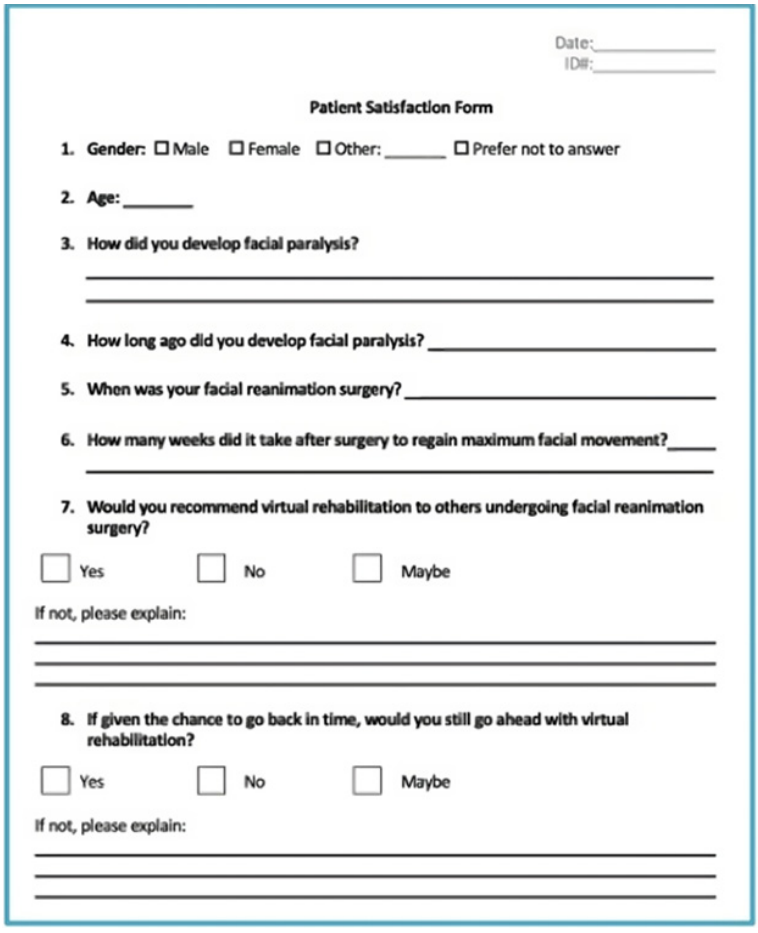
- Limited data exists outlining the appropriate exercises and outcomes for this specific population.
- Limited physiotherapy expertise for facial reanimation in Atlantic Canada.
- Lack of accessible visual review materials for physiotherapy exercises throughout the duration of therapy Figure 2.

Figure 2: Before and 6 months after dual nerve transfer for facial paralysis [6].

Methods

Virtual Rehabilitation (see Figure 3)

Facial exercise rehabilitation program was created upon consultation with experts in the field. Rehabilitation program was recorded in video format, demonstrating and explaining the facial exercises. Video also includes section on the facial reanimation procedure and relevant anatomy.



Date:_____
ID#:_____

Patient Satisfaction Form

1. **Gender:** ☐ Male ☐ Female ☐ Other: _____ ☐ Prefer not to answer
2. **Age:** _____
3. **How did you develop facial paralysis?**
   _____
   _____
4. **How long ago did you develop facial paralysis?** _____
5. **When was your facial reanimation surgery?** _____
6. **How many weeks did it take after surgery to regain maximum facial movement?** _____
   _____
7. **Would you recommend virtual rehabilitation to others undergoing facial reanimation surgery?**

☐ Yes ☐ No ☐ Maybe

If not, please explain:

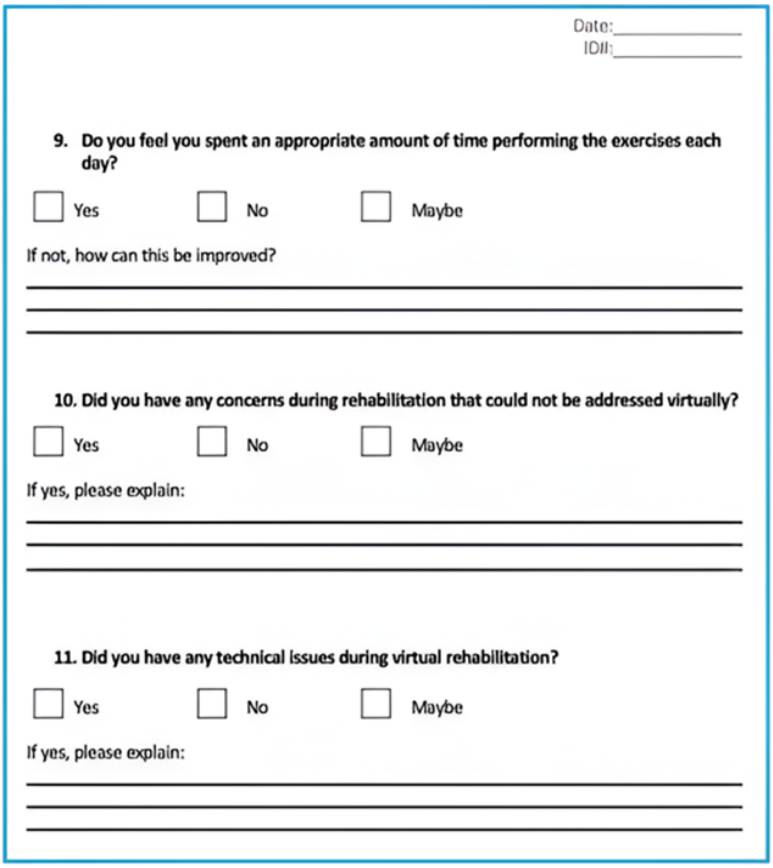
_____
_____
_____

8. **If given the chance to go back in time, would you still go ahead with virtual rehabilitation?**

☐ Yes ☐ No ☐ Maybe

If not, please explain:

_____
_____
_____



Date:_____
ID#:_____

9. **Do you feel you spent an appropriate amount of time performing the exercises each day?**

☐ Yes ☐ No ☐ Maybe

If not, how can this be improved?

_____
_____
_____

10. **Did you have any concerns during rehabilitation that could not be addressed virtually?**

☐ Yes ☐ No ☐ Maybe

If yes, please explain:

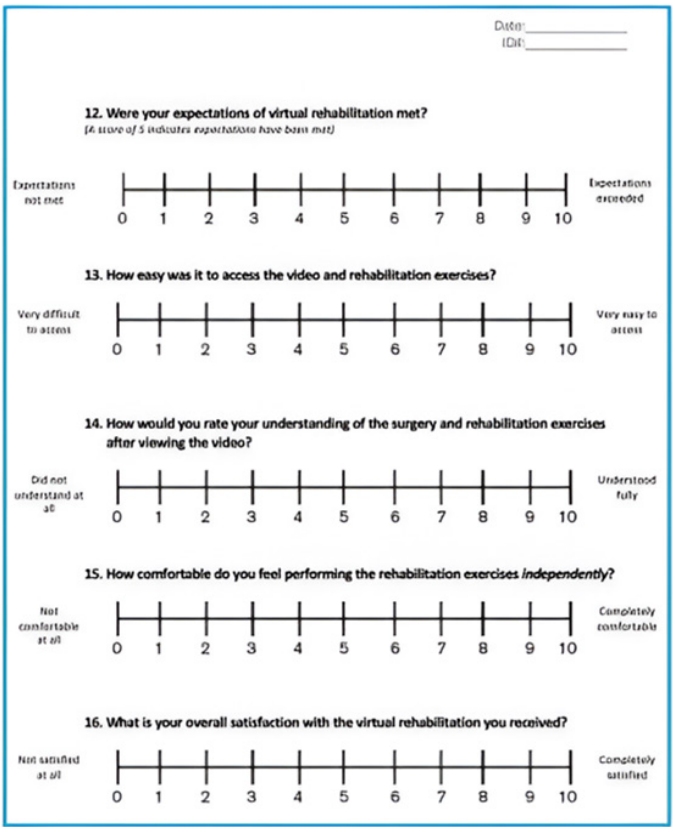
_____
_____
_____

11. **Did you have any technical issues during virtual rehabilitation?**

☐ Yes ☐ No ☐ Maybe

If yes, please explain:

_____
_____
_____



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12. **Were your expectations of virtual rehabilitation met?**
(A score of 5 indicates expectations have been met)

Expectations not met — 0 1 2 3 4 5 6 7 8 9 10 — Expectations exceeded

13. **How easy was it to access the video and rehabilitation exercises?**

Very difficult to access — 0 1 2 3 4 5 6 7 8 9 10 — Very easy to access

14. **How would you rate your understanding of the surgery and rehabilitation exercises after viewing the video?**

Did not understand at all — 0 1 2 3 4 5 6 7 8 9 10 — Understood fully

15. **How comfortable do you feel performing the rehabilitation exercises *independently*?**

Not comfortable at all — 0 1 2 3 4 5 6 7 8 9 10 — Completely comfortable

16. **What is your overall satisfaction with the virtual rehabilitation you received?**

Not satisfied at all — 0 1 2 3 4 5 6 7 8 9 10 — Completely satisfied

Figure 3: Patient Satisfaction Form (Post-operative).

Patient Satisfaction Surveys (see Figure 4)

Surveys were designed to gain information on patients' satisfaction with virtual rehabilitation using Likert scale and open-ended questions. Pre-operative survey: to obtain a baseline on patients understanding of virtual rehabilitation, impression, and expectations. Post-operative survey: focus on several areas related to satisfaction including: time spent on exercises, concerns, expectations, and technical issues.

Figure 4: Example of virtual rehabilitation exercise: "Jaw clench" [7].

Next Steps

Recruit participants undergoing dual nerve transfer surgery to participate in our study. Perform statistical analyses on data from pre-operative and postoperative surveys to improve virtual rehabilitation. Expand our scope of virtual rehabilitation to other surgeries outside of the dual nerve transfer procedure. Have a virtual rehabilitation resource that can be used for patients outside of Atlantic Canada.

YouTube Link

Link to the rehabilitation video

https://www.youtube.com/watch?v=4I3BoaINFN0

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