

Do Tracheal Traction Exercises Help Prevent Dysphagia following Anterior Cervical Spine Surgery: A Randomized Double Blind Placebo Controlled Trial

Mina Botros, Takaki Shimizu¹, Courtney Marie Cora Jones, Samantha Hoffman, Kiah Mayo, Emmanuel Nganku Menga, Robert W Molinari, Paul T Robery, Addisu Mesfin

¹Kanazawa University

INTRODUCTION:

Dysphagia is a common complication following anterior cervical spine surgery. Length of esophageal retraction, endotracheal tube pressure, multi-level fusions, revision surgeries, and implant (plate) prominence have been associated with a higher risk of dysphagia. Studies have reported preoperative Tracheal Traction Exercises (TTE) can decrease the rate of dysphagia associated with anterior cervical spine surgery. However, there has been no randomized clinical trial to examine the effects of TTE on dysphagia post-anterior cervical spine surgery. Our hypothesis is that TTE prior to anterior cervical spine surgery has minimal effect on the rate of postoperative dysphagia using the Swallowing Quality of Life questionnaire (SWAL-QOL).

METHODS:

A total of 145 patients (73 intervention and 72 control) undergoing elective anterior cervical spine surgery (C2-T1) for degenerative disc disease, or myelopathy, between 1/2015 to 5/2022 underwent computer randomization, to the intervention group (TTE) or control group. Subjects in the intervention group underwent training prior to their surgery on how to perform TTE exercise, and the control group underwent placebo training. The exercises were performed for 4 to 5 days prior to surgery (depending on the subject's surgical date) ten repetitions, three times a day. All subjects completed the SWAL-QOL, questionnaires preoperatively, and the SWAL-QOL at 1 week, 6 week, 3 months, 6 months, and 12 months postoperatively. Statistical analysis involved the use of bivariate analysis to examine changes perioperative and procedural characteristics between both groups. Multivariable regression analysis was performed. All multivariable models controlled for patient- and procedure-level confounders.

RESULTS:

Seventy-three randomized TTE exercises prior to surgery whereas 72 randomized to perform placebo cervical exercises. The TTE cohort aged 54.5 ± 10.5 years, compared to the control cohort 54.2 ± 10.33 years ($p=0.85$). The TTE is composed of 47.67% females whereas the control cohort 51.95% ($p=0.67$). There is equal distribution of race groups between the intervention and cohort groups (White: 84.93%; Black: 10.96% versus White: 83.3%; Black: 16.6%, $p=0.08$). No difference between group in preoperative myelopathy ($p=0.28$) and radiculopathy ($p=0.11$). No difference between both study groups in the number of levels fused ($p=0.75$), type of anterior cervical plate used ($p=0.59$), and plate thickness ($p=0.84$). Intervention group had a shorter length of stay 1.90 ± 2.0 , compared to the control group 2.40 ± 2.74 ($p=0.041$). There was no statistical difference between preoperative and 1 week, 6 week, 3 months, 6 months, and 12 months postoperative SWAL-QoL score, between both study groups. Surgical variables, cervical fusion levels, number of levels fused, type of cervical plate showed no impact on postoperative SWAL-QoL.

DISCUSSION AND CONCLUSION:

Dysphagia is common following anterior cervical spine surgery. This randomized double blind placebo-controlled trial demonstrated preoperative tracheal traction exercises did not decrease dysphagia rates and were equivalent to placebo exercises.

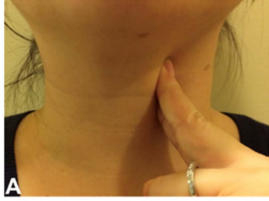


Figure 1A. TTE exercise. The index and middle finger are positioned medial to the sternocleidomastoid

Figure 1B. The trachea and esophagus are pushed medially. This is repeated 10 times, 3 times a day for 4 to 5 days pre-operatively.



Figure 2. Placebo exercise. The index, middle fingers and thumb are used to massage the midline structure (trachea and thyroid). This is repeated 10 times, 3 times a day for 4 to 5 days