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Title: International and multicenter prospective controlled study of dysphagia after anterior cervical spine surgery

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Introduction: In the context of anterior approach to the cervical spine, dysphagia is a common complication considered and still without a clear interaction with risk factors [1,2]. This surgical approach is also well common, moving the postoperative dysphagia to an evident and demanding research subject, for future prevention [3,4]. This study aims to analyze the risk factors of dysphagia after cervical spine surgery. **Materials & Methods:** a multicenter

prospective study was designed to evaluate patients who underwent anterior cervical spine surgery for degenerative pathologies, studying surgical, anesthesia, base disease, and radiological variables, with control group matched for patients who underwent degenerative lumbar spine surgical procedures. The sample size was calculated considering immediate post-operative dysphagia prevalence as 30% with a 7% error, and incidence of 5% 6-month dysphagia considering a 3.5% error. With these data, the suggested sample size was 210 patients. Postoperative dysphagia was assessed by Swallowing Satisfaction Index (SSI) and Swallowing Questionnaire (SQ) – quantitative score system; besides, based on multiple logistic regression model, a risk factor analysis correlation was applied. Besides base disease, anesthesia, and patients´ variables, dysphagia questionnaires were applied preoperatively, 24-hours, 1 and 3 weeks, and 6 months after surgery; cervical images and radiological features (level, cervical lordosis, C2-C7 angle, SVA, etc) were assessed and compared in groups related to dysphagia cases identified, for risk factors positive correlation study. **Results:** 233 cervical patients were evaluated and 158 composed control group (lumbar surgery); ASA 2 score and number of intubations attempts equal or more than twice were most prevalent for both groups; most common spinel level approached was C5-C6 (71.8%), with one or two levels compromised on 86%. Both groups have same decreasing trade for dysphagia incidence regarding postoperative timepoints serial evaluations – with more cases on cervical group (p,0.05, from 1 day to 6 months postoperative). Regarding intensity, severe cases were rare, with majority identified as mild and self-limited. Based on multiple logistic regression model, at postoperative day 1, identified risk factors were: surgical approach to C3-C4 (4.11, $p<0.01$), loss of preoperative cervical lordosis (2.26, $p<0.01$), intubation attempts ≥ 2 (3.10, $p<0.01$) and left side approach (1.85, $p = 0.02$); at day 7, BMI ≥ 30 (2.29, $p=0.02$), approach to C3-C4 (3.42, $p<0.01$) and length of surgery ≥ 90 hours (2.97, $p=0.005$); at day 21, approach of C3-C4 were kept as a risk factor (3.62, $p<0.01$). **Conclusions:** a high incidence level of dysphagia was identified in anterior cervical approach to spine, having a clear decreasing trending in relation to number of cases and severity through postoperative timepoints; considering possible risk factors, the strongest correlation was the approach at the C3-C4 level, which was statistically significant at the 24 hours, 7 days, and 21 days assessment.

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