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Does resident participation influence otolaryngology-head and neck surgery morbidity and mortality?

Abt NB, Reh DD, Eisele DW, Francis HW, Gourin CG

OBJECTIVES/HYPOTHESIS: Patients may perceive resident procedural participation as detrimental to their outcome. Our objective is to investigate whether otolaryngology-head and neck surgery (OHNS) house staff participation is associated with surgical morbidity and mortality.

STUDY DESIGN: Case-control study.

METHODS: OHNS patients were analyzed from the American College of Surgeons National Surgical Quality Improvement Program 2006 to 2013 databases. We compared the incidence of 30-day postoperative morbidity, mortality, readmissions, and reoperations in patients operated on by resident surgeons with attending supervision (AR) with patients operated on by an attending surgeon alone (AO) using cross-tabulations and multivariable regression.

RESULTS: There were 27,018 cases with primary surgeon data available, with 9,511 AR cases and 17,507 AO cases. Overall, 3.62% of patients experienced at least one postoperative complication. The AR cohort had a higher complication rate of 5.73% than the AO cohort at 2.48% (P < .001). After controlling for all other variables, there was no significant difference in morbidity (odds ratio [OR] = 1.05 [0.89 to 1.24]), mortality (OR = 0.91 [0.49 to 1.70]), readmission (OR = 1.29 [0.92 to 1.81]), or reoperation (OR = 1.28 [0.91 to 1.80]) for AR compared to AO cases. There was no difference between postgraduate year levels for adjusted 30-day morbidity or mortality.

CONCLUSIONS: There is an increased incidence of morbidity, mortality, readmission, and reoperation in OHNS surgical cases with resident participation, which appears related to increased comorbidity with AR patients. After controlling for other variables, resident participation was not associated with an increase in 30-day morbidity, mortality, readmission, or reoperation odds. These data suggest that OHNS resident participation in surgical cases is not associated with poorer short-term outcomes

Summary

- A study based in a large quality-controlled national prospective- recorded database (NSQIP) with more than 27.000 registries with an specific question in a limited range of procedures that cover the most common surgeries made by ENT and head and neck surgeons.
- The analysis of data followed the accepted standards for this type of studies using bivariate and multivariate analysis for adjusting for confusion factors.
- After adjustment, any of the patient-centered outcomes (morbidity, mortality or reoperation) and administrative outcomes (length of stay) showed statistically significant differences between surgeries made with or without residents. The only expected difference was in operative time, were resident procedures double the attending procedures time.

Strengths

- The NSQIP data are of good quality because they introduce trained personal for recording the data and the amount of data available is huge in order to capture even a smaller difference.
- The selection of the type of procedures follow a clinical logic, because they represent the common procedures the resident should made by his own one they arrive to clinical practice. Therefore, the study is trying to evaluate what is really needed in a typical clinical routine.

Weaknesses

- There is always a doubt if the resident is acting as the main surgeon or as an assistant, because these data cannot be captured. For certain procedures as laryngectomy or glossectomy with neck dissection it is possible to assume that the resident acts as an assistant in a complex procedure, which is highly important and for much of us, is a blessing to have a high level resident helping in these tasks. To attempt such a type of surgery only by an attending will be overconfident.
- Criticisms related with administrative data exposes that they occult a lot of variables that cannot be measured. The NSQIP is one of the stronger databases ever built, but still are prone to biases of the design.
- Maybe is not a weakness of the study, but the system. With the high number of procedures reported and the growing shortage of time and experience for residents during his training time; to see such a big imbalance between numbers for attending and residents as in tonsillectomy, adenoidectomy, parathyroidectomy, submandibular gland excision and thyroidectomy; alerts about the misuse of potential educational experiences for in training personnel.

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Risk of Complications after Thyroidectomy and Parathyroidectomy: A Case Series with Planned Chart Review

Meltzer C, Klau M, Gurushanthaiah D, Titan H, Meng D, Radler L, Sundang A

Objective. To develop a predictive model for the risk of complications after thyroid and parathyroid surgery. Study Design. Case series with planned chart review of patients undergoing surgery, 2007-2013. Setting. Kaiser Permanente Northern California and Kaiser Permanente Southern California.

Subjects and Methods. Patients (N = 16,458) undergoing thyroid and parathyroid procedures were randomly assigned to model development and validation groups. We used univariate analysis to assess relationships between each of 28 predictor variables and 30-day complication rates. We subsequently

entered all variables into a recursive partitioning decision tree analysis, with P \.05 as the basis for branching.

Results. Among patients undergoing thyroidectomies, the most important predictor variable was thyroid cancer. For patients with thyroid cancer, additional risk predictors included coronary artery disease and central neck dissection. For patients without thyroid cancer, additional predictors included coronary artery disease, dyspnea, complete thyroidectomy, and lobe size. Among patients undergoing parathyroidectomies, the most important predictor variable was coronary artery disease, followed by cerebrovascular disease and chronic kidney disease. The model performed similarly in the validation groups.

Conclusion. For patients undergoing thyroid surgery, 7 of 28 predictor variables accounted for statistically significant differences in the risk of 30-day complications; for patients undergoing parathyroid surgery, 3 variables accounted for significant differences in risk. This study forms the foundation of a parsimonious model to predict the risk of complications among patients undergoing thyroid and parathyroid surgery

Summary: This paper describes an evidence based prediction model that is specific to thyroid and parathyroid surgery as an alternative to the National Surgical Quality Improvement Program (NSQIP) surgical risk calculator. This new model takes into account thyroid and parathyroid surgery-specific comorbidities, such as Graves' and Hashimoto's diseases, and surgery-specific complications, such as hypocalcemia and vocal cord paralysis.

10.9% of patients undergoing thyroidectomy had complications. Having thyroid cancer was the most important risk predictor and associated with 19.7% chance of risk. Coronary artery disease in those with thyroid cancer was associated with 43.3% complications. Central neck dissection is associated with 26.7% chance of risk in those without CAD. Please see 2 figures below for further details regarding risk of patients undergoing thyroidectomy and parathyroidectomy.
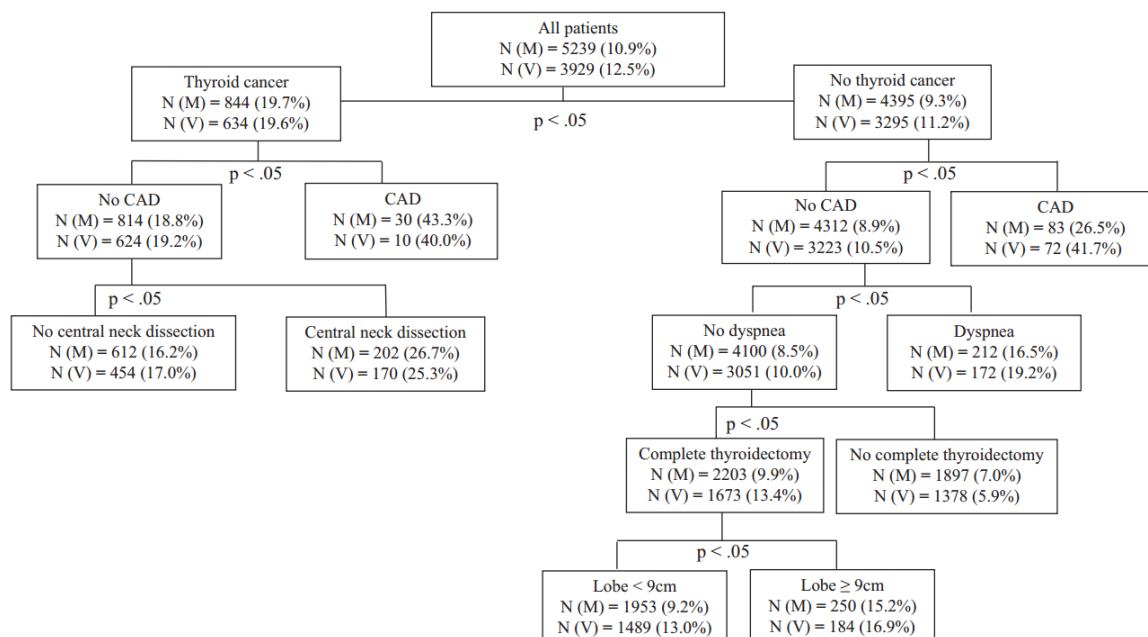

Figure 2. Number of patients and complication rates after thyroidectomy in modeling and validation groups. CAD, coronary artery disease; M, modeling group; V, validation population.
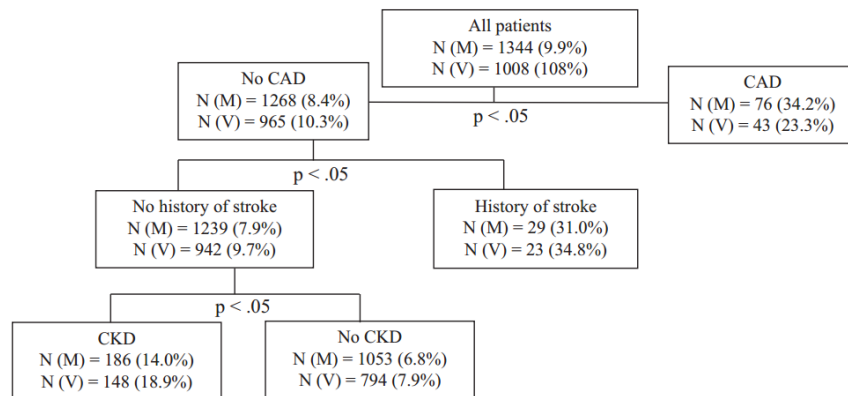
Figure 3. Complication rates after parathyroid surgery. CAD, coronary artery disease; CKD, chronic kidney disease: M, modeling group; V, validation group.

Strengths:
- This paper is the first to apply decision tree analysis to complications after thyroid and parathyroid surgery. Classic statistical methods, such as logistic regression, assume that predictors independently exert influence over the entire data set; in contrast, decision tree analyses recursively divide data into subgroups and examine the influence of different factors based on their statistical importance for subgroups.
- Data is obtained from integrated care delivery system with an N= 16,458. I recommend readers pull the paper. Table 1 lists complications rates for 23 complications from this large database. Tables 2-5 list detailed and thorough presurgical patient characteristics and variables to predict the risk of complications. The information included can certainly be used to in preoperative assessment and discussions with the patient.

Weaknesses:
- Data is obtained from integrated care delivery system; generalizability is unknown.
- Assessed a robust array of predictor variables, however, unmeasured factors may affect findings. For example, because authors focused only on patient risk factors, they did not assess the influence of surgeon volume or hospital volume on outcomes.

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Randomized Trial of Vitamin C/E Complex for Prevention of Radiation-Induced Xerostomia in Patients with Head and Neck Cancer

Chung MK, Kim do H, Ahn YC, Choi JY, Kim EH, Son YI

from *Otolaryngology Head & Neck Surgery*, September 2016

Objective. The present study was conducted to determine the preventive efficacy of vitamin C/E complex supplementation for radiotherapy (RT)–induced xerostomia in patients with head and neck cancer.

Study Design. Prospective, double-blinded, randomized, placebo-controlled study.

Setting. A single tertiary referral institution.

Subjects and Methods. The trial group (n = 25) received antioxidant supplements (100 IU of vitamin E 1 500 mg of vitamin C) twice per day during RT, while the control group (n = 20) received an identical placebo. Pre-RT and 1 and 6 months post-RT, patient-reported xerostomia questionnaires, observer-rated

xerostomia score, and salivary scintigraphy were serially obtained to compare xerostomia severity between the 2 groups. Results. The trial group showed greater improvements in xerostomia questionnaire and score at 6 months post-RT when compared with those at 1 month post-RT (P = .007 and .008, respectively). In contrast, the control group showed no changes between 1 and 6 months post-RT. By salivary scintigraphy, there was no difference in maximal accumulation or ejection fraction between the 2 groups. However, the trial group maintained significantly better oral indices at the prestimulatory (P = .01) and poststimulatory (P = .009) stages at 1 month post-RT, compared with the control group. At the final follow-up, there was no difference in overall survival and disease-free survival between the 2 groups.

Conclusions. Our data suggest that short-term supplementation with an antioxidant vitamin E/C complex exerts a protective effect against RT-induced xerostomia.

Summary: This paper describes a randomized trial of Vitamin C/E treatment vs. placebo in patients undergoing adjuvant or definitive RT (with or without concurrent chemotherapy). Timepoints for evaluation were pre-RT (baseline), 1mo and 6mo post-RT. For both patient reported and observer rate survey tools, xerostomia increased significantly from baseline at 1 mo post-RT. The treatment group, however, demonstrated improvement back to baseline (patient reported) and nearing baseline (observer rated) at 6mo post-RT. This improvement was statistically significant. The control group demonstrated no improvement in either survey between the 1mo and 6mo time points.
Salivary scintigraphy was performed and maximum accumulation, ejection fraction and oral indices were measured. MA and EF did not demonstrate a difference between treatment and control groups. Oral indices appeared. Oral indices is measured in prestimulatory (PRI) and poststimulatory (POI) oral activity index. PRI is used to quantify the amount of spontaneous salivary secretion; the POI is used to quantify the amount of salivary secretion after stimulation. The trial group maintained significantly improved PRI and POI at 1mo post-RT compared to control. Additionally, there was no difference in overall survival or disease free survival between the control and treatment groups.

Strengths:
- Use of over the counter, commercially available Vitamin C/E complex.
- Use of both patient reported and observer rated survey tools.
- Use of salivary scintigraphy as an objective data point (although see weaknesses below)

Weaknesses:
- Incomplete salivary scintigraphy data as subjects complained of severe discomfort during the procedure, more so than expected by the investigators. Only 16 or 26 patient were able to complete scintigraphy at all 3 time points.
- The authors did not further subdivide the analysis into patient who received surgery vs not. They did indicate that there was no significant difference between the control and treatment groups with regards to adjuvant vs definitive RT or CCRT.