Postoperative Complications and Readmission Rates Following Surgery for Laryngopharyngeal Cancer

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ABSTRACT

Objective:
To investigate postoperative complications and reoperation/readmission rates following laryngopharyngeal cancer surgery and to identify risk factors associated with overall complications and reoperation/readmissions.

Study Design:
Retrospective analysis was performed on the 2013 American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) dataset.

Methods:
Patients with oropharyngeal, hypopharyngeal, and laryngeal cancer were identified using relevant ICD-9-CM diagnosis codes. Demographics, perioperative information, and 30-day postoperative complications were analyzed. Multivariate analysis was used to evaluate risk factors associated with postoperative complications and reoperation/readmissions.

Results:
430 patients underwent laryngopharyngeal cancer surgery. The overall complication rate was 26.5%. The most common complications were anemia requiring blood transfusion (14.9%), wound dehiscence (4.4%), and deep incisional infection (3.3%). Unplanned readmission and reoperation rate were 11.9% and 11.6%, respectively. Pulmonary comorbidity was a significant risk factor for a complication (odds ratio [OR] = 2.40; 95% confidence interval [CI]: 1.32-4.38; p = 0.004) and reoperation/readmission (OR = 2.22; 95% CI = 1.18-4.20; p = 0.01). Chronic steroid use was also significantly associated with a complication (odds ratio [OR] = 3.18; 95% confidence interval [CI]: 1.10-9.21; p = 0.03) and reoperation/readmission (OR = 2.94; 95% CI = 1.03-8.36; p = 0.04).

Conclusion:
Following laryngopharyngeal cancer surgery, the most common complications include anemia requiring blood transfusion, wound dehiscence, and deep incisional infection. Pulmonary comorbidity and chronic steroid use were risk factors for postoperative complications, readmissions and reoperations. This information will help identify high-risk patients and complications early.

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INTRODUCTION

- Laryngopharyngeal cancer surgery comprises operations of the oropharynx, hypopharynx, and larynx. Oropharyngeal, hypopharyngeal, and laryngeal cancer are associated with significant morbidity. Depending on the extent of disease, a variety of multi-modality treatment options may be used.
- There is a paucity of information describing postoperative complications, readmission, and reoperation rates following surgery for laryngopharyngeal cancer.
- The aim of this study was to investigate postoperative complications, reoperation, and readmission rates following laryngopharyngeal cancer surgery and identify associated risk factors using the 2013 American College of Surgeons National Surgical Quality Improvement Program database.

METHODS AND MATERIALS

- All patients who underwent oropharyngeal, hypopharyngeal, and laryngeal cancer surgery were identified using International Statistical Classification of Disease codes (ICD-9) which included: 146.0, 146.1,146.2, 146.3, 146.4, 146.5, 146.6, 146.7, 146.8, 146.9, 148.0, 148.1,148.2, 148.9, 161.0, 161.1, 161.2, 161.3, 161.8, and 161.9.
- The data collected included current procedural terminology codes (CPT), patient demographics, patient comorbidities, perioperative variables, and postoperative complications, readmission, and reoperation within thirty days of surgery.
- Multivariate analysis was performed to determine if the variables collected were associated with postoperative complication, readmission, or reoperation.

RESULTS

- 430 patients who underwent laryngopharyngeal cancer surgery were identified. The primary sites of cancer included oropharynx (5.9%), tonsil (33.6%), supraglottic (14.4%), larynx (13.7%), and glottis (9.4%).
- The overall postoperative complication rate was 26.5%. The most common complications were anemia requiring blood transfusion, wound dehiscence, and deep incisional infection (Table 2).
- The unplanned readmission and reoperation rate were 11.9% and 11.6%, respectively.
- Multivariate analysis demonstrated pulmonary comorbidity and chronic steroid use were significant risk factors for a postoperative complication and reoperation/readmission (Table 2, Table 3).

Table 1. Postoperative Complications Within 30 Days of Surgery

	% (N)
Overall	26.5 (114)
Superficial surgical site infection	2.5 (11)
Deep incisional infection	3.4 (15)
Organ space infection	1.6 (7)
Wound Dehiscence	4.3 (19)
Pneumonia	3.0 (13)
Unplanned intubation	1.8 (8)
Ventilator dependence >48 hours	2.7 (12)
Pulmonary embolism	0.7 (3)
Deep vein thrombosis	1.6 (7)
Myocardial Infarction	0.7 (3)
Cardiac arrest requiring CPR	1.1 (5)
Urinary tract infection	0.2 (1)
Sepsis	2.1 (9)
Septic Shock	0.9 (4)
Blood transfusion	14.6 (64)
Unplanned readmission	11.9 (51)
Unplanned reoperation	11.6 (50)
Mortality	1.4 (6)

Table 2. Multivariate analysis of risk factors associated with laryngoropharyngeal surgery postoperative complication

	Odds ratio [95% CI]	P value
Gender		
Female	Reference	
Male	1.34 [.66-2.71]	0.41
Age Group		
18-44 yrs	Reference	
45-64 yrs	1.21 [0.3-4.88]	0.79
65-79 yrs	1.63 [0.4-6.72]	0.5
80 or more yrs	1.37 [0.22-8.61]	0.74
Race		
White	Reference	
Other	1.09[0.51-2.33]	0.82
BMI		
<18.5	2.93 [1.14-7.54]	0.03
18.5-24.9	Reference	
25-29.9	0.55 [0.29-1.03]	0.06
30 or more	0.56 [0.27-1.16]	0.12
Pulmonary comorbidity		
No	Reference	
Yes	2.4 [1.32-4.38]	0.004
Cardiovascular comorbidity		
No	Reference	
Yes	0.95 [0.56-1.62]	0.84
Smoking		
No	Reference	
Yes	0.59 [0.32-1.06]	0.08
DM		
No	Reference	
Yes	0.94 [0.43-2.04]	0.87
Weight loss		
No	Reference	
Yes	3.99 [1.64-9.72]	0.002
Chronic steroid use		
No	Reference	
Yes	3.18 [1.1-9.21]	0.03

Table 3. Multivariate analysis of risk factors associated with laryngoropharyngeal surgery readmission and reoperation

	Odds ratio [95% CI]	P value
Gender		
Female	Reference	
Male	1.37 [0.64-2.95]	0.42
Age Group		
18-44 yrs	Reference	
45-64 yrs	1.14 [0.24-5.42]	0.87
65-79 yrs	1.79 [0.37-8.65]	0.47
80 or more yrs	0.94 [0.11-8.16]	0.96
Race		
White	Reference	
Other	1.09 [0.51-2.33]	0.82
BMI		
<18.5	2.61 [0.99-6.84]	0.05
18.5-24.9	Reference	
25-29.9	0.79 [0.4-1.58]	0.51
30 or more	0.95 [0.44-2.03]	0.9
Pulmonary comorbidity		
No	Reference	
Yes	2.22 [1.18-4.2]	0.01
Cardiovascular comorbidity		
No	Reference	
Yes	1.03 [0.58-1.82]	0.93
Smoking		
No	Reference	
Yes	0.64 [0.34-1.22]	0.18
DM		
No	Reference	
Yes	1.38 [0.62-3.07]	0.43
Weight loss		
No	Reference	
Yes	1.9 [0.77-4.72]	0.16
Chronic steroid use		
No	Reference	
Yes	2.94 [1.03-8.36]	0.04

DISCUSSION

- There is little recent literature describing the postoperative complications, readmission and reoperation rates in patients undergoing laryngopharyngeal surgery. The aim of this study was to further evaluate the incidence and risk factors for postoperative complications, readmission and reoperation in patients undergoing laryngopharyngeal cancer surgery.
- The most common complications after total laryngectomy (TL), include stomal and/or tracheosophageal puncture complications, stomal cellulitis and pharyngocutaneous fistula[1]. In these patients undergoing TL, the 30-day unplanned readmission rate was 26.5%[1]. In another study of otolaryngology patients, 30-day unplanned readmission rate was determined to be 7.3%[2]. These rates are in alignment with the readmission rate determined in this study.
- The findings of this study highlight the importance of counseling patients with pulmonary comorbidities and chronic steroid use on their potentially increased risk for both postoperative complications and reoperation/readmission.
- This study has several limitations primarily related to the variables excluded from the ACS-NSQIP database. The database only reports complications within thirty days of primary surgery. The potential long-term consequences, and otolaryngology specific complications of laryngopharyngeal cancer surgery are unclear from this work.

CONCLUSION

- Following laryngopharyngeal cancer surgery, the most common complications include anemia requiring blood transfusion, wound dehiscence, and deep incisional infection.
- Pulmonary comorbidity and chronic steroid use were risk factors for postoperative complications, readmission, and reoperations.
- This information may help identify patients at higher risk of postoperative complication.

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