

Abstract

Objective: To compare the effect of patient factors, including age, on 30-day postoperative outcomes and complications for patients undergoing transcervical Zenker's diverticulectomy.

Methods: Retrospective cross-sectional analysis of the American College of Surgeons National Surgical Quality Improvement Program database was conducted to identify cases of open Zenker's diverticulectomy (CPT 43130) performed between 2006 and 2018. Outcomes analyzed include patient demographics, preoperative comorbidities, operative characteristics, and postoperative outcomes.

Results: A total of 614 patients were identified. Mean age of patients was 71.1 years, with 13.4% older than age 85. Postoperative complications occurred in 6.7%, with a mortality rate of 0.3%. Smoking status and prior congestive heart failure both had significant effect on postoperative complication rate.

Conclusion: Age was not found to be an independent risk factor associated with adverse outcomes following open cervical diverticulectomy, suggesting this procedure can safely be performed in patients with advanced age.

Introduction

Zenker's diverticulum disproportionately affects an elderly population with symptoms that compromise quality of life. These patients are also more likely to have other comorbid conditions, which can make management challenging. Although surgical management is the standard treatment for Zenker's diverticulum, the therapeutic goal in the elderly population is to improve functional outcome while limiting potential for morbidity and mortality. We sought to identify the role of age and other preoperative factors on 30-day outcomes following open surgery.

Methods and Materials

A retrospective review was conducted using the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database from 2006-2018 to identify patients undergoing open Zenker's diverticulectomy (CPT 43130). Outcomes analyzed include patient demographics, medical comorbidities, admission type, operative characteristics, length of admission, postoperative complication, readmission, and reoperation rates. The primary effect of age was grouped into 4 categories: adult (<65 years), early elderly (65-74 years), middle elderly (75-84 years), and late elderly (≥85 years). The modified frailty index (mFI-5) was calculated using the binary presence or absence of 5 preoperative patient factors: COPD, CHF, hypertension, diabetes, and functional status.

Results

Table 1. Population Demographics

Variable	Patient (N=614)
Age (mean +/- SD, years)	71.1 +/- 11.9
<65 years	26.6% (163)
65 to 74 years	29.1% (178)
75 to 84 years	30.9% (189)
≥85 years	13.4% (82)
Race	
African American	3.6% (20)
Caucasian	93.5% (515)
Other	2.9% (16)
Unknown/Not Reported	63
Gender	
Female	40.4% (248)
Male	59.6% (366)
BMI (mean +/- SD)	26.8 +/- 5.6
Surgery Location	
Inpatient	70.2% (431)
Outpatient	29.8% (183)
Selected Medical Comorbidities	
Bleeding disorder	2.8% (17)
Congestive heart failure	0.8% (5)
Chronic obstructive pulmonary disease	7.0% (43)
Cerebrovascular accident	3.2% (7)
Diabetes	10.6% (65)
Hypertension	52.1% (320)
Peripheral vascular disease	2.7% (6)
Smoker	9.6% (59)
Steroid use	4.2% (26)
Weight loss	3.3% (20)
Surgeon Specialty	
General Surgery	41.2% (253)
Otolaryngology	46.9% (288)
Thoracic Surgery	11.9% (73)
Preoperative Functional Status	
Dependent	3.9% (24)
Independent	96.1% (590)
Modified Frailty Index-5	
0	86.3% (530)
0.2	12.9% (79)
≥0.4	0.8% (5)
Complication Rate	6.7% (41)
Surgical site infection	2.3% (14)
Organ space infection	1.8% (11)
Other*	5.7% (35)
Operative Time (mean +/- SD, min)	96.5 +/- 60.3
Length of Stay (mean +/- SD, day)	3.1 +/- 4.0
Mortality Rate	0.3% (2)
Readmission Rate	7.2% (27)
Reoperative Rate	6.4% (39)

Table 1. Demographics and postoperative outcomes of included population.

Table 2. Relationship to Complication Rate

Variable	Complication Rate	P value
Age Group		0.163
<65	6.8%	
65-74	4.5%	
75-84	6.4%	
≥85	12.2%	
Smoker	15.3%	0.008
Congestive heart failure	40.0%	0.014
Hypertension	5.0%	0.086
Modified Frailty Index-5		0.453
0	6.8%	
0.2	5.1%	
≥0.4	20.0%	

Table 2. Relationship of selected preoperative factors to rate of complications.

Table 3. Multivariate Model for Complication Rate

Variable	Odds Ratio (95% CI)
Age	
65-74 vs. <65	0.77 (0.29, 2.01)
75-84 vs. <65	1.17 (0.48, 2.85)
≥85 vs. <65	2.37 (0.87, 6.45)
Gender, male vs. female	1.00 (0.52, 1.95)
Smoking	3.40 (1.43, 8.08)
Congestive heart failure	6.02 (0.82, 43.92)

Table 3. Multivariate logistic regression model including significant predictors.

Discussion and Conclusions

Open cervical diverticulectomy is most common performed on an older population (mean age 71.1 years). Preoperative smoking status was found to have a significant effect on complication rate, as did heart failure, both of which have been well documented in the literature.

Despite 13.4% of the population age 85 or older, there was no significant role for age on any postoperative outcome. Thus suggesting this procedure can be performed safely on patients of any age, and age itself is not an independent risk factor for poor surgical outcomes. Preoperative discussion regarding patient factors including social and medical history is encouraged.

*Other includes acute renal failure, cardiac arrest, stroke, deep vein thrombosis, failure to wean, myocardial infarction, sepsis, pneumonia, pulmonary embolism, reintubation, and urinary tract infection

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