



Outcome predictors for cervical abscess in the pediatric population

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Introduction

The incidence of pediatric deep neck space infections, such as parapharyngeal or retropharyngeal abscesses, was estimated to be 4.6 per 100,000 children in 2009,¹ and the cost of managing these patients was greater than \$75 million.¹ The incidence of retropharyngeal abscesses doubled between 2000 and 2009, and the cost of managing all pediatric deep neck infections also nearly doubled across the same time period.² Consequently, it is important to recognize factors that influence outcomes in order to best manage the increasing numbers of cervical abscesses.

The purpose of this study was to evaluate outcome predictors in pediatric cervical abscesses treated with surgical intervention in order to guide management of these infections.

Methods

Pediatric patients with cervical abscesses were identified based on CPT codes in the American College of Surgeons National Quality Improvement Program from 2012-2014. Patients were compared based on demographics, history of asthma, recent steroid use, abscess signs/symptoms, management by an otolaryngologist or non-otolaryngologist, and outcomes. Hospital length of stay and time to surgical drainage were analyzed using quantile regression. Readmission and reoperation related to cervical abscess were analyzed using linear regression.

Table 1: Characteristics of patients included in the study

Patient Characteristics	
Total number of patients	1443
Age (mean years)	4.51
Gender	
Male	790
Female	653
Race/ethnicity	
White	758
Black or African American	238
Hispanic	262
Other	56
ASA Classification	
ASA 1	505
ASA 2	783
ASA 3	140
ASA 4	14
Mean preoperative WBC count (in thousands/microliter)	18.54
Asthma (number of patients)	60
Steroid use within 30 days (number of patients)	63
Preoperative SIRS/sepsis/septic shock (number of patients)	703

Results

1,443 cases of pediatric cervical abscesses were identified, and the patient characteristics are displayed in Table 1. Elevated pre-operative white blood cell (WBC) count was related to prolonged hospitalization ($p = 0.0008$) and decreased time to surgical drainage ($p = 0.0009$). Patients were monitored longer prior to surgery when managed by an otolaryngologist (1.2 days vs 0.61 days, $p < 0.0001$), and these patients spent more time in the hospital (3.7 days vs 2.3 days, $p < 0.0001$). Other factors related to prolonged hospitalization were history of asthma ($p < 0.0001$), ASA class ($p < 0.0001$), and abscess location ($p < 0.0001$). Age correlated with time to surgical intervention ($p < 0.0001$).

Gender, ethnicity, history of steroid use, and preoperative SIRS/sepsis/septic shock did not influence time to surgery or length of hospitalization. There was no statistical significance between any of the analyzed factors and readmission or reoperation related to cervical abscesses (Table 2).

Discussion

Prior studies have aided in determining when to use medical and/or surgical management in the treatment of pediatric cervical abscesses. For instance, abscesses larger than 2 cm or those that fail to respond to conservative management within 48 hours are likely to require surgical intervention.^{3,4}

The present study demonstrates that earlier surgical intervention, when indicated, can result in decreased length of hospitalization. Furthermore, the results of this study are consistent with prior literature in showing no change in the morbidity or mortality associated with cervical abscesses when surgical intervention is pursued earlier in the course of the infection.⁵

Early identification of patients unlikely to respond to conservative management of deep neck space infections with antibiotics can allow for earlier surgical intervention. This can lead to decreased length of hospitalization, decreased financial burden of cervical abscesses, and no change in the morbidity and mortality associated with these infections.

Table 2: Comparison of patient characteristics to readmission or reoperation related to cervical abscess.

	Readmission related to cervical abscess			Reoperation related to cervical abscess		
	Yes (n = 35)	No (n = 1408)	p-value	Yes (n = 49)	No (n = 1394)	p-value
Age (mean years)	3.60	4.53	0.2150	4.17	4.52	0.5742
Gender						
Male	20	770	0.7732	28	762	0.7318
Female	15	638		21	632	
Race/ethnicity						
White	16	742	0.7861	27	731	0.3343
Black	4	234		5	233	
Hispanic	7	255		13	249	
Other	2	54		1	55	
ASA Classification						
ASA 1	11	494	0.9125	18	487	0.5460
ASA 2	20	763		24	759	
ASA 3	4	136		7	133	
ASA 4	0	14		0	14	
Surgical Specialty						
Otolaryngology	32	1302	0.8177	46	1288	0.7005
Non-otolaryngology	3	106		3	106	
Preoperative WBC count (mean)	18.95	18.53	0.7623	18.46	18.55	0.9392
History of asthma						
Yes	2	58	0.6422	2	58	0.9784
No	33	1350		47	1336	
Steroid use within 30 days						
Yes	2	61	0.6929	2	61	0.9211
No	33	1347		47	1333	
Preoperative SIRS/sepsis/septic shock						
Yes	17	686	0.9860	29	674	0.1387
No	18	722		20	720	

Conclusions

Patients who spend more time in the hospital prior to surgical intervention for cervical abscesses have similar outcomes to patients who received surgical intervention earlier. Earlier intervention is associated with decreased length of hospitalization in this patient population.

References

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