

Effects of Diagnostic Tonsillectomy Prior to Definitive Surgical Treatment of Tonsil Cancer

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Introduction

The workup varies for suspected tonsil cancers by general Otolaryngologists prior to referral to for definitive treatment. When a suspicious tonsil mass is present a diagnostic tonsillectomy is sometimes performed. However, after referral it is often unclear whether these patients have had adequate oncologic surgery. This makes determining the best definitive treatment approach and the extent of additional treatment difficult.

One definitive treatment option for early tonsil cancers is a radical tonsillectomy. In patients who recently underwent a diagnostic tonsillectomy with unclear margins additional resection may be necessary to definitively extirpate all disease. This may result in several detrimental outcomes including:

- Increased surgical morbidity (pain, dysphagia)
- Increased complications (postoperative hemorrhage, velopharyngeal insufficiency)
- More frequent positive margins, ultimately leading to increased recurrence

Study Aim: Identify measurable differences in patient outcomes based on whether or not a diagnostic tonsillectomy was performed prior to definitive surgery for tonsil cancer

Methods and Materials

- **Study Design:** IRB approved, retrospective chart review
- **Setting:** Urban, academic, tertiary referral center
- **Inclusion Criteria:** Pathology proven tonsil squamous cell carcinoma, treatment by radical tonsillectomy (CPT 42842)
- **Exclusion Criteria:** Prior Head and Neck Cancer, pre-existing gastrostomy tube, less than 3 months of follow up
- **Analysis:** Patients were stratified based on prior diagnostic tonsillectomy. Comparisons were made for:
 - Baseline Characteristics
 - Morbidity and margin status
 - Recurrence-Free survival
- **Statistics**
 - Groups were compared by Student's T, Mann Whitney and Chi-square tests for normal continuous, non-normal continuous and categorical variables, respectively.
 - Recurrence-free survival was calculated using Kaplan-Meier methods and compared by log-rank testing
 - Significance was set at $p < 0.05$

Table 1. Patient, Tumor and Treatment Characteristics Stratified by Diagnostic Tonsillectomy

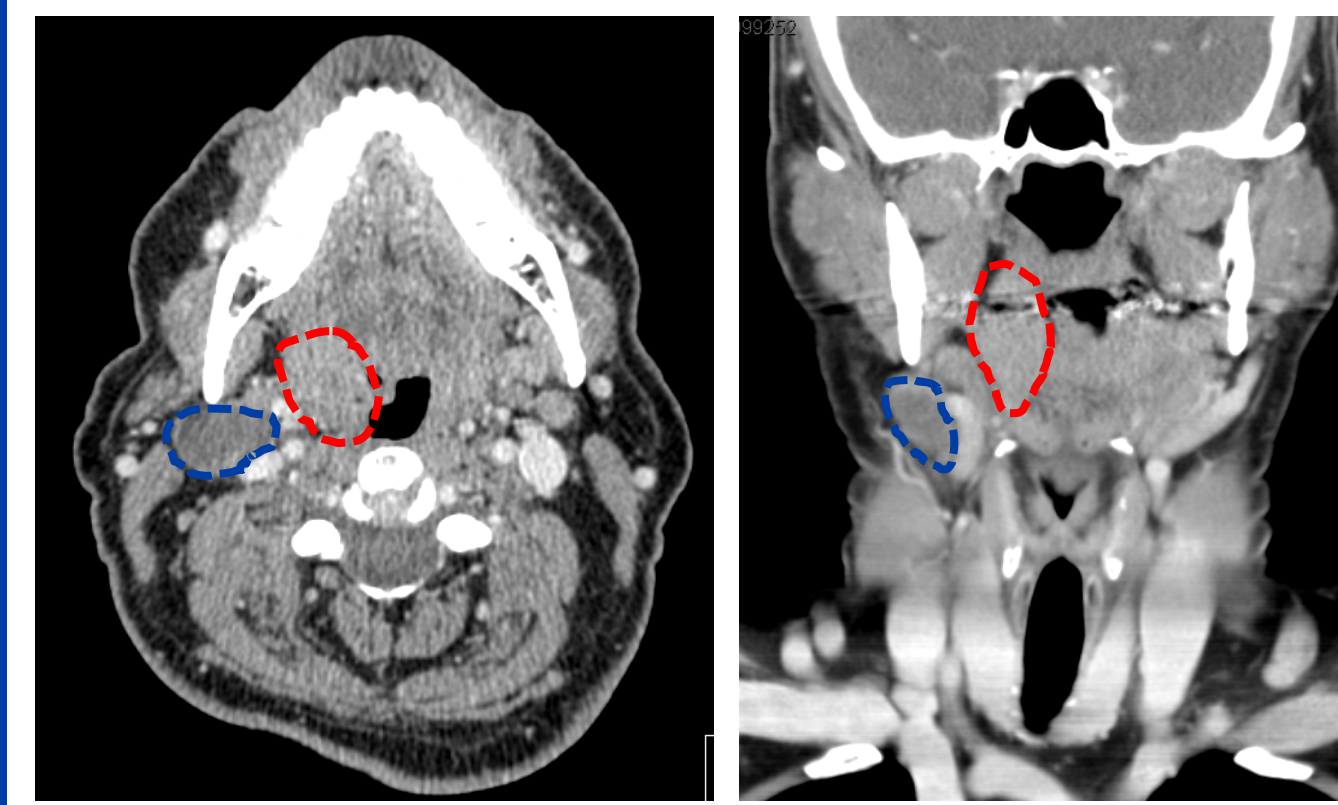
	No Prior Diagnostic Tonsillectomy	Prior Diagnostic Tonsillectomy	p-value
n	24	6	
Age (mean (sd))	59.00 (9.70)	54.33 (11.09)	0.314
Sex (Male, %)	17 (70.8)	5 (83.3)	1
Tumor Stage (%)			
x	2 (8.3)	1 (16.7)	
1	12 (50.0)	3 (50.0)	1
2	9 (37.5)	2 (33.3)	
3	1 (4.2)	0 (0.0)	
Nodal Stage (%)			
0	6 (25.0)	2 (33.3)	
1	6 (25.0)	1 (16.7)	0.8
2a	4 (16.7)	0 (0.0)	
2b	7 (29.2)	3 (50.0)	
Treatment Modality (%)			
Surgery	12 (50.0)	2 (33.3)	
Surgery, XRT	8 (33.3)	2 (33.3)	0.724
Surgery, CRT, XRT	4 (16.7)	2 (33.3)	
Surgical Approach (%)			
Transoral Cautery	14 (58.3)	3 (60.0)	
Robotic	8 (33.3)	2 (40.0)	1
Mandibulotomy	2 (8.3)	0 (0.0)	

Results

- Baseline characteristics were similar between groups (Table 1)
- 6 of 14 patients referred with tonsil cancer had a diagnostic tonsillectomy prior to referral. 4 of these 6 had cervical lymph nodes amenable to fine needle aspiration to establish a malignant diagnosis.
- 2 of 6 patients with prior diagnostic tonsillectomies had additional cancer found in the revision surgical specimen
- Patients who had prior a diagnostic tonsillectomy had
 - Higher gastrostomy tube rates (33.3% vs 25.0%)
 - More velopharyngeal insufficiency (33.3% vs 25.0%)
 - Closer final margins (mean 1.1 mm vs 2.2 mm)
- 4 of 30 patients experienced recurrence for an overall 3-year recurrence free survival of 90.2% (95% CI: 78 -100%)
- There was no difference in recurrence-free survival based on prior diagnostic tonsillectomy

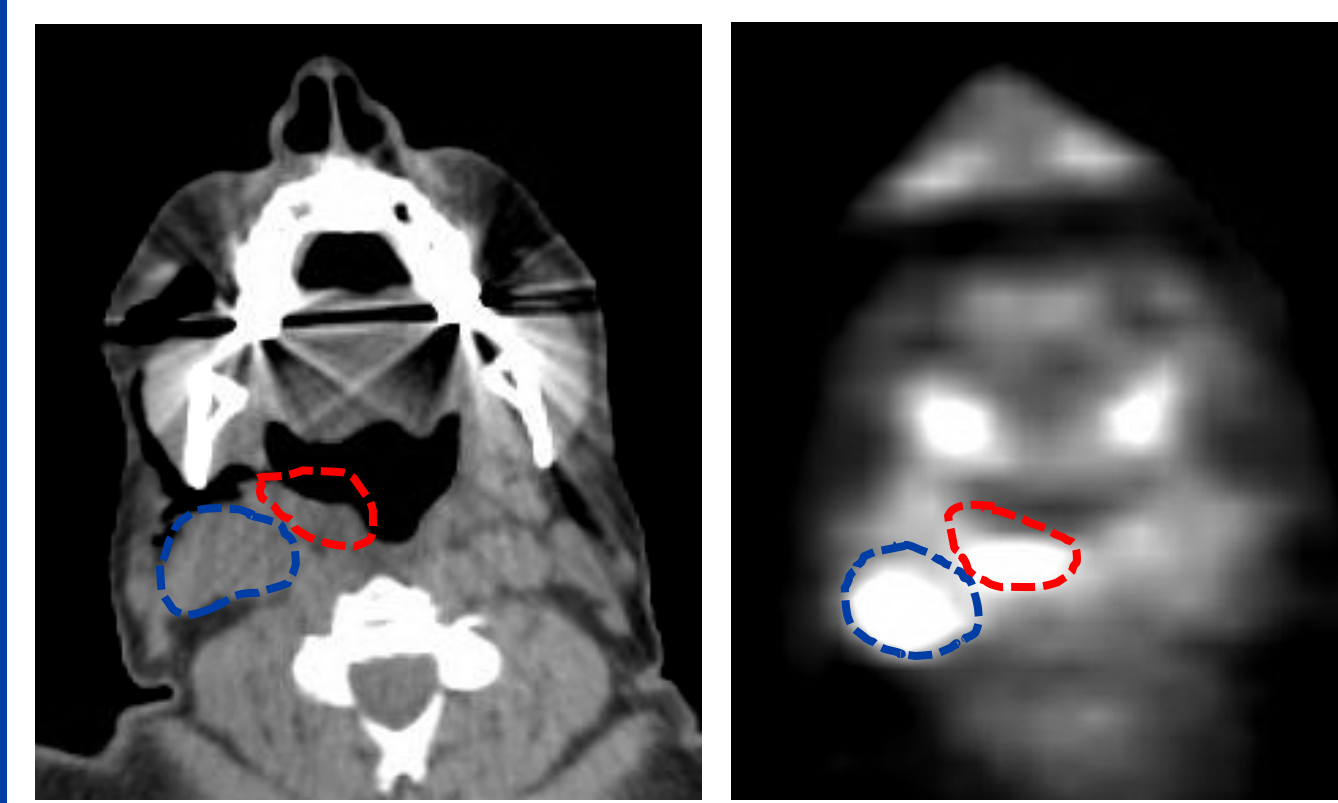
Figure. Example Case

A. Prior to tonsillectomy



A 57 year old smoker presented to a local Otolaryngologist with a growing right neck mass and right tonsillar enlargement. Pretreatment contrast CT (A) showed a cystic right level II node (blue line) and enlarged right tonsil (red line). He underwent a right neck core biopsy and bilateral tonsillectomy, both showing squamous cell carcinoma, with < 1mm margin in the tonsil specimen.

B. After tonsillectomy with close margin



Post-tonsillectomy PET/CT (B) shows residual FDG-avidity in the right tonsillar fossa (red line) and neck node (blue line). He was then referred for further management and ultimately treated with a revision radical tonsillectomy, right selective neck dissection with scar excision and adjuvant radiotherapy.

Table 2. Outcomes Stratified by Diagnostic Tonsillectomy

	No Prior Diagnostic Tonsillectomy	Prior Diagnostic Tonsillectomy	p-value
Months of Follow up (median [interquartile range])	31.50 [11.25, 39.50]	9.50 [2.00, 14.75]	0.087
Gastrostomy Tube (%)	6 (25.0)	2 (33.3)	0.645
Postoperative Hemorrhage (%)	3 (12.5)	0 (0.0)	1
Velopharyngeal Insufficiency (%)	6 (25.0)	2 (33.3)	0.645
Positive Intraoperative Frozen Section (%)	8 (33.3)	2 (33.3)	1
Closest Margin on Main Surgical Specimen (mean (SD))	2.2 (1.7)	1.1 (0.14)	0.384
Positive Final Margin (%)	2 (8.3)	0 (0.0)	1
No Tumor Found in Radical Tonsillectomy Specimen (%)	3 (13.0)	4 (66.7)	0.018

Discussion

- With a 33% risk of residual disease, revision surgery is reasonable after a diagnostic tonsillectomy without definitively clear margins
- Radical tonsillectomy after a diagnostic tonsillectomy is associated with increased morbidity. Recurrence risk may also be increased based on narrower surgical margins, although no differences in recurrence was identified in this study.
- Diagnostic tonsillectomy in the setting of a suspicious tonsil mass exposes patients to an additional morbid procedure (tonsillectomy) without clear oncologic benefit
- Confirmation of these results in a larger cohort would support educational efforts to improve the workup of tonsil cancers by general Otolaryngologists

Conclusions

- Before referral to a cancer center, diagnostic tonsillectomy should be avoided when alternative biopsy options are available for diagnosis
- Beyond a biopsy, surgery on a known or suspicious tonsil cancer should be performed in a setting capable of definitive extirpation
- Revision surgery after diagnostic tonsillectomy is warranted given the risk of residual disease

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