

Abstract

Background: In patients with a history of laryngeal squamous cell carcinoma (L-SCC), there is a paucity of data evaluating the utility of routine (performed without preceding suspicious symptoms or signs of recurrence) surveillance imaging over 6 months since treatment.

Educational Objective: To evaluate the diagnostic utility of routine surveillance imaging for L-SCC locoregional recurrence beyond 6 months since treatment.

Methods: A retrospective review of all patients with L-SCC who received definitive treatment at our institution from 2005-2013 and underwent routine surveillance imaging with MRI, CT or PET/CT beyond 6 months with at least 6 months of follow up after each routine scan.

Results: From 140 patients with a diagnosis of L-SCC, 23 patients had undergone 43 routine surveillance scans after 6 months since treatment (24 MRIs, 10 CTs, and 9 PET/CTs). The mean number of routine surveillance scans after 6 months per patient was 1.86 (range 1-4) with a mean time of 14 months between scans. Average total follow-up time since treatment was 54 months (range 15-120). No (0%) locoregional recurrences and two (8.6%) distant metastatic lesions were identified on these routine scans (1 PET/CT and 1 MRI). There was one false positive scan (4.3%) and no false negative scans.

Conclusion: In the absence of new suspicious signs or symptoms, the detection of locoregional recurrence in L-SCC patients is low. Routine surveillance imaging may not be useful enough to justify the costs. Regular symptom assessment and endoscopic physical exams are important to identify early concerning symptoms and signs of recurrent L-SCC.

Introduction

Laryngeal squamous cell carcinoma (L-SCC) has an incidence of 13,560 new cases per year, making it the 3rd most common of head and neck squamous cell carcinoma (HNSCC) and comprising 0.8% of all new cancer cases in 2015¹. Treatment algorithms developed by the national comprehensive cancer network (NCCN) are well characterized and include either surgery or chemoradiation or some combination thereof. Choice of therapy is largely predicated upon preoperative staging, but also includes consideration of preservation of voice and swallowing functions.

Despite multimodal therapy and advances in treatment modalities, 29% of all glottic cancer patients in one large retrospective review developing locoregional or distant recurrence². Coupled with a general paucity of evidence to support surveillance strategies, this high rate of recurrence has led many providers to pursue routine surveillance in asymptomatic patients³. Current NCCN guidelines recommend imaging within 6 months of definitive treatment with re-imaging recommended based only upon worrisome signs and symptoms or for clinically inaccessible sites⁴. Indeed, if other subsites within the head and neck are evaluated, it can similarly be seen that routine surveillance imaging in the absence of suspicious signs and symptoms has low utility^{5,6}.

Methods

Through searching the UCSF Cancer Registry 140 patients were identified with a diagnosis of L-SCC from 2005 to 2013.

Inclusion Criteria:

- Biopsy proven LSCC with primary site in the subglottis, supraglottis, glottis or larynx cartilage
- The patient underwent any modality of treatment with curative intent for their LSCC at UCSF
- The patient had no clinical or radiographic evidence of disease persistence 6 months after definitive treatment
- The patient had clinical follow-up beyond the six months after treatment during which he or she demonstrated no new symptoms (i.e. pain, hoarseness, dysphagia, cough) or physical exam findings concerning for recurrence
- The patient had at least one surveillance imaging scan (either MRI, CT or PET/CT) of the head and neck greater than 6 months after treatment.

Each surveillance scan on a patient without symptoms or signs of recurrence was then categorized as **positive, equivocal or negative** for recurrence.

A **positive** reading was recorded if one or more of the following criteria were met:

- New area(s) of growth or signal change in locoregional areas on the routine surveillance scan
- Persistent progression of a mass indicative of recurrence
- Distant metastasis

A **negative** reading was recorded if there was no evidence of disease within the imaged region.

An **equivocal** reading was recorded if there was no definitive evidence of recurrence, but recurrence could not be ruled out.

The following criteria were used to determine if the read of each surveillance scan was a true positive, false positive, false negative or true negative over the six months following the date of the routine surveillance scan: (1) a biopsy determined pathologic diagnosis (2) a subsequent head and neck scan within 6 months determined the presence or absence of continued suspicion for malignancy (3) death within 6 months was highly likely to have been caused by locoregional recurrence and (4) death was from another cause with a coincident high likelihood of locoregional recurrence at the time of death.

Results

Age, yr (range 43-79)

Mean	64
Median	66

Gender (n=23)

Male	20 (87%)
Female	3 (13%)

Primary Tumor Site

Supraglottis	5 (22%)
Glottis	18 (78%)
Subglottis	0

TNM Stage

1	9 (39%)
2	1 (4%)
3	7 (30%)
4	6 (26%)

Primary Treatment

Surgery alone	5 (22%)
XRT alone	15 (65%)
Surgery + XRT	3 (13%)

Modality of surveillance scans

MRI	24 (56%)
CT	10 (23%)
PET/CT	9 (21%)

Total follow up period, mo (range 15-120)

Mean	54
Median	49

Table 1. Patient characteristics

Results

Symptomatic patients undergoing surveillance imaging (n=6)

Recurrence	3 (50%)
Ultimately had negative biopsy	2 (33.3%)
Distant metastasis	1 (16.6%)

Table 2. Surveillance scans in symptomatic patients

		Recurrence	
		Yes	No
Scan	“Positive”	2	1
	“Negative”	0	20

Sensitivity	100%
Specificity	95%
PPV	66.7%
NPV	100%

Table 3. Findings from asymptomatic surveillance scans

Discussion

- Most patients who had routine asymptomatic imaging had between 1-2 scans.
- No cases of local recurrence were identified on routine surveillance imaging in an asymptomatic patient.
- In both patients where recurrent disease was identified on asymptomatic imaging, the findings were incidental lung metastases.
- Though sample size is limited, symptomatic imaging had higher clinical utility compared to routine asymptomatic scans.

Conclusion

- In the absence of new or suspicious signs and symptoms, routine surveillance imaging may not improve diagnostic utility.
- Surveillance of laryngeal squamous cell carcinoma should continue to rely upon history and physical examination.

Contact

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