

Clinical Relevance of Incidentally Noted Asymmetric Oropharyngeal Hyperavidity on PET/CT

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Abstract

Outcome Objectives: The relationship of tonsillar asymmetry detected by PET/CT to malignancy is unknown. Appropriate care based on PET/CT findings is therefore not data driven. This study aims to determine the clinical and radiographic features associated with a higher risk profile for likelihood of malignancy in oropharyngeal asymmetric avidity on PET/CT. Additionally, we review the clinical outcomes of patients with asymmetric avidity who were managed conservatively and compare outcomes with those who were managed with tonsillar biopsy and surgical intervention.

Hypothesis: We hypothesize that incidentally noted asymmetric oropharyngeal hyperavidity on PET is unlikely to be secondary to occult malignancy.

Aim 1: To identify clinical and radiographic features associated with a higher risk profile for likelihood of malignancy in oropharyngeal asymmetric avidity

Aim 2: To look at followup in patients who have been managed conservatively

Aim 3: To review pathology and impact on clinical decision making and outcome in patients with asymmetry who underwent surgical intervention

INTRODUCTION

Positron emission tomography (PET) is an imaging study that identifies increased areas of metabolism and cellular turnover through increased uptake of radiolabeled 18-fluorodeoxyglucose (18-FDG).^{1,2} Combined PET/CT has improved the staging, treatment, evaluation, and detection of recurrent disease in patients with head and neck cancer.³⁻⁵ However, FDG is not a tumor-specific biomarker, and various inflammatory processes can lead to increased FDG uptake and potential false-positive results.¹¹

When looking at other subsites in the head and neck, such as the tonsils, which can be a site of inflammatory processes as well as cancers, FDG uptake in these situations has not been clearly defined. The relationship of asymmetry to malignancy is unknown and appropriate care based on PET findings is as a result not data driven.

We hypothesize that the likelihood of incidental tonsil asymmetry on PET revealing an occult malignancy is low. As a result we plan to review the series of noted tonsils and assess what has happened in terms of management and followup. We aim to demonstrate that these findings are commonly spurious and that in the absence of symptoms and neck adenopathy, these cases should be observed and this will avoid morbidity and undo health care costs.

OBJECTIVES

Primary endpoint: To examine clinical outcomes of patients with incidentally noted asymmetric oropharyngeal avidity who do not receive any diagnostic surgical intervention

Long-term objectives/what research will accomplish: we aim to demonstrate that incidentally noted asymmetric oropharyngeal hyperavidity is unlikely to be associated with occult malignancy and that in the absence of clinically concerning history or exam findings, these patients may be observed

METHODS

- Institutional board review (IRB) approval was obtained
- A retrospective case review was performed using an outpatient electronic health record system
- Accrued patients were previously operated patients at Fox Chase Cancer Center between 1990 and 2015

Data obtained during this review included:

- Indication for PET/CT
- PET characteristics
- Subjective and objective findings on examination
- Management strategy

Sample Size per Group (B/A)	Detectable Difference
100/400	0.11
75/425	0.13
50/450	0.16

Variance stabilizing and normalizing transformations will be applied to the data as and when appropriate. Descriptive statistics for demographic characteristics, disease presentation and clinical variables such as SUV, tonsil asymmetry etc. will be summarized for the biopsy and intervention groups. Continuous and ordinal variables will be compared between groups using analysis of variance or the Kruskal-Wallis test; and categorical variables will be analyzed using Fisher's exact test. In addition, multivariable logistic regression will be used to correlate clinical and demographic variables with incidence of malignancy in oropharyngeal asymmetric avidity. Stepwise model selection will be used to develop a parsimonious model. All tests will be two sided and will use a 5% Type I Error.

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