Multicenter Trial of [^{18}F]fluorodeoxyglucose Positron Emission Tomography/Computed Tomography Staging of Head and Neck Cancer and Negative Predictive Value and Surgical Impact in the NO Neck: Results From ACRIN 6685

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abstract

PURPOSE The objective of this study was to determine the negative predictive value (NPV) of positron emission tomography (PET)/computed tomography (CT) for the clinically NO neck on the basis of neck dissection.

METHODS Participants with newly diagnosed, first-time, head and neck squamous cell carcinoma (HNSCC) and at least one clinically NO neck side for which dissection was planned were included. A total of 287 participants were prospectively enrolled from 23 American College of Radiology Imaging Network-qualified institutions. PET/CT was compared with findings at neck dissection.

RESULTS PET/CT scans and pathology findings were available for 270 NO neck sides from 212 participants. For visual assessment, the NPV specific to the clinical-NO sides was 0.868 (95% CI, 0.803 to 0.925). For dichotomized maximum standardized uptake value, the NPVs specific to the nodal basins were 0.940 (95% CI, 0.928 to 0.952) and 0.937 (95% CI, 0.925 to 0.949) at prespecified cutoffs of 2.5 and 3.5, respectively. The optimal cutoff maximum standardized uptake value was determined to be 1.8, with an NPV of 0.942 (95% CI, 0.930 to 0.953). The PET/CT-informed surgical treatment plan was changed in 51 of 237 participants (22%) compared with the PET/CT-blinded surgical plan. In 34 participants (14%), this led to planned dissection of additional nodal levels. In 12 participants (5%), this led to fewer planned dissected nodal levels. Negative PET/CT scans in NO necks was true negative in 87% and false negative in 13%.

CONCLUSION [^{18}F]fluorodeoxyglucose-PET/CT has high NPV for the NO neck in T2 to T4 HNSCC. The surgical treatment plans on the basis of PET/CT findings may be changed in approximately 22% of this group. These findings suggest that [^{18}F]fluorodeoxyglucose-PET/CT may assist the clinician in deciding on the best therapy for the clinically NO neck in HNSCC. Well-designed clinical trials should be performed to test the outcome of omitting neck dissection by using PET/CT.

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INTRODUCTION

The treatment strategy for patients with head and neck squamous cell carcinoma (HNSCC) without evidence of lymph node involvement (NO neck) has long been an issue of debate.¹⁻⁵ Retrospective studies report a 20% to 30% incidence of occult metastases across all primary locations.⁶⁻⁸ The incidence and location of occult lymph node metastases varies by size and site of the primary tumor.⁹⁻¹¹

Positron emission tomography (PET) with computed tomography (CT) using [^{18}F]fluorodeoxyglucose (FDG) is reliable in detecting lymph node metastases in HNSCC.¹²⁻¹⁷ It has been reported that PET imaging is

cost effective for staging patients with NO neck.¹⁸ Most of the data on PET/CT in the NO neck is single institutional and retrospective. Most prior studies report high sensitivity and specificity for PET/CT, but false-positive readings are a source of confusion. Ideally, when PET achieves a high NPV for the NO neck, it may avoid unnecessary therapy for the neck, which will reduce expense, time lost from work, and treatment-related morbidities.

We present data from the ACRIN 6685 trial, a prospective, nonrandomized, multicenter study of PET/CT on participants presenting with clinical T2 to T4NO HNSCC. All participants enrolled had a neck dissection (defined as at least three nodal levels resected) on the

ASSOCIATED CONTENT

See accompanying Editorial on page 1683

Data Supplements

Author affiliations and support information (if applicable) appear at the end of this article.

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side of the neck identified as NO (ipsilateral to the primary cancer) and occasionally on the contralateral side, if indicated by proximity of the lesion to the midline or anatomic subsites known for a propensity for bilateral nodal spread. We present the results of the primary end point of this study of the NPV for PET/CT in the evaluation of the NO neck and the impact of PET/CT on surgical treatment plans.

METHODS

Participants

A total of 287 participants older than 18 years of age were recruited from 23 sites (listed in the Data Supplement). All participants had newly diagnosed, first-time, HNSCC that was being considered for surgical resection. Participants with poorly controlled diabetes (fasting glucose level > 200 mg/dL) were excluded. Eligible participants had HNSCC in the (1) oral cavity; or (2) oropharynx, including the base of the tongue and tonsil; or (3) larynx, including the supraglottis. At least one side of the neck planned for surgical dissection was clinically NO according to physical examination and preoperative magnetic resonance imaging (MRI) and/or CT evaluation. A clinically NO neck was defined as being free of palpable lymph nodes and with neck CT and/or MRI neck lymph node sizes of less than 1 cm and 1.5 cm for jugular digastric nodes (IIa), spinal accessory nodes (IIb), or submental-submandibular nodes (Ia and Ib) or showing a lack of central lymph node necrosis in nodes of any size. Participants all received a presurgical FDG-PET/CT scan to which the surgeon was blinded and a contrast-enhanced MRI or CT scan of the neck (all within 4 weeks of surgery). The surgical plans were devised by the local surgeons on the basis of physical examination and CT and/or MRI results, but not PET/CT (pre-PET/CT surgical plan) and thereafter formulated with the PET/CT result (post-PET/CT surgical plan), and both plans were collected prospectively with questionnaires. All participants provided written informed consent and all sites received approval for participation from their local investigational review boards. All data were anonymized to protect the identities of the participants.

Imaging

Imaging with FDG-PET/CT was performed with a dedicated head and neck (H&N) PET/CT using two bed positions from the orbits to the upper thorax (top of aortic arch) with arms down and with images acquisitions at 6 minutes per bed position. Of the 248 eligible participants, 54 underwent H&N scans only, 30 underwent whole-body (WB) scans only, and six underwent neither. Imaging from the orbits or chest through the upper thighs was also obtained. See the Data Supplement for detailed methods of imaging, image analysis, surgery methods, and pathology methods.

Statistical Analysis

There were 287 participants enrolled by December 30, 2016. Imaging results and pathology evaluations were

analyzed at the neck level for the eligible participants, that is, summarizing all lymph node basins for left and right sides separately, with pathology findings defining the final NO status of all basins. The analysis was first performed using the WB scans when dedicated H&N scans were not available (defined as best available FDG-PET/CT scans) and then, for all participants who received H&N scans (defined as H&N FDG-PET/CT scans only), a subset analysis was performed. The proportion of negative pathologic results was computed for the necks with negative visual assessment (ie, NPV estimation). To estimate the CIs, the multistage bootstrap was used to account for the correlation between sides of necks from the same patient.¹⁹ The 2.5% and 97.5% percentiles are reported as the estimate of the 95% CI through the multistage bootstrapping. This association between maximum standardized uptake value (SUVmax) and the pathologic evaluation was calculated by first dichotomizing the SUVmax at the pre-specified cutoff (2.0, 2.5, and 3.5) per the protocol and then modeled via the generalized estimating equation with the log-link function (ie, Poisson regression).²⁰ An optimal SUVmax was also assessed from Youden index in receiver operating characteristic after imputing the missing SUVmax as 1.5 (background).²¹ For the nodal basins with missing SUVmax measurements (uptake too low to be distinguished from background), we imputed the dichotomized standardized uptake value (SUV) as negative if its malignancy level was classified as Probably benign, Definitely benign, or No nodes seen by the central readers. Subgroup analyses of the NPV values were performed by tumor stage and location, and a *P* value threshold of .05 was used to declare statistical significance. Concordance among readers was evaluated by reporting overall concordance rates with the multistage bootstrapped CIs for visual assessment and for dichotomized SUVmax measurements. Analyses were performed using SAS 9.4 (SAS Institute, Cary, NC) and R 3.3.3.

RESULTS

Demographics

The participant characteristics are listed in Table 1. An abbreviated Standards for the Reporting of Diagnostic Accuracy Studies diagram is shown in Figure 1. A participant-level diagram and enrollment plot are included in the Data Supplement. Individual neck sides are shown, allowing for the potential for two NO neck sides to be counted in one individual if both sides met the study eligibility criteria. A total of 313 neck sides were evaluated in this way. Some participants could not be analyzed because neck dissection was not performed or tissue results were not available. First, 21 participants (27 sides of necks) had no surgery. The reasons were that six withdrew, 10 had neck dissection cancelled, and five received palliation or died. Second, three participants (five sides of necks) had unknown surgery status (two patients withdrew, and one site withdrew). Third, four participants (four sides of necks)

TABLE 1. Participants Characteristics: All Registered and Eligible Participants

Participants	Enrolled (n = 287)	Eligible (n = 248)
Median age, years (minimum-maximum)	59 (24-95)	59 (24-95)
Race/ethnicity*		
Asian	40 (14.9)	35 (14.1)
Black or African American	21 (7.3)	17 (6.9)
Hispanic or Latino	4 (1.4)	4 (1.6)
Other (American Indian/unknown)	8 (2.8)	7 (2.8)
White	219 (76.3)	190 (76.6)
Male	192 (66.9)	164 (66.1)
Primary tumor location†‡		
Oral cavity	184 (64.1)	159 (64.1)
Pharynx	53 (18.5)	43 (17.3)
Glottis§	48 (16.7)	47 (19.0)
Clinical T stage		
T1	13 (4.5)	0 (0)
T2	164 (57.1)	153 (61.7)
T3	50 (17.4)	44 (17.7)
T4	54 (18.8)	49 (19.8)
Clinical N stage		
N0	237 (82.6)	218 (87.9)
N1	24 (8.4)	15 (6.0)
N2A	3 (1.0)	3 (1.2)
N2B	13 (4.5)	8 (3.2)
N3	2 (0.7)	1 (0.4)
NX	2 (0.7)	1 (0.4)
Clinical M stage		
M0	219 (76.3)	189 (76.2)
MX	62 (21.6)	57 (23.0)
Lateralization of tumor		
Right	119 (41.5)	106 (42.7)
Left	128 (44.6)	108 (43.5)
Bilateral	14 (4.9)	14 (5.6)
Midline	20 (7.0)	18 (7.3)
Side of the neck that was N0†		
Right	34 (11.8)	22 (8.9)
Left	24 (8.4)	18 (7.3)
Both sides	221 (77.0)	206 (83.1)
Neither side	3 (1.0)	0 (0.0)

NOTE. Data are No. (%) unless otherwise indicated. Stages are based on the *American Joint Committee on Cancer Staging Manual*.²²

*Multiple races/ethnicities may be endorsed by a single participant, such that the total overall options may sum to greater than 100%. Of the enrolled participants, five endorsed unknown race/ethnicity, and nine endorsed multiple races/ethnicities. Of the eligible participants, four endorsed unknown race/ethnicity, and eight endorsed multiple races/ethnicities.

†These data are unavailable for five enrolled participants and two eligible participants.

‡A single participant may have multiple tumor locations, such that the total overall options may sum to greater than 100%. For the enrolled participants, one had the location left blank, and three had multiple locations listed. For the eligible participants, one had the location left blank, and three had multiple locations listed.

§With 25 of these being supraglottic.

||These data are unavailable for six enrolled participants and two eligible participants.

FIG 1. Standards for the Reporting of Diagnostic Accuracy Studies diagram: neck-level portion. Numbers of NO necks evaluated are shown. The total number of NO necks (*) with surgery planned is the number of sides of necks that were NO and had surgery planned pre-positron emission tomography (PET) in eligible participants with PET examinations available for review (see Data Supplement for participant-level portion).

had dissection of one side only; one was NO only on the side not dissected, and three were NO on both sides. Of these four, the dissection plan changed after the PET/CT on one patient, and no reason was given for the three other patients. Five participants had surgery but no lymph node pathology, two because gross tumor was remaining at surgery, one because the protocol was not followed, one withdrew and had surgery at another facility, and one had lost pathology results.

Imaging and Pathology Results

For the quality assurance of pathology results, we received 30 of 46 requested samples (yield rate, 65%) from 16 sites,

and the concordance was 100% between central and local interpretations. We show results using the dedicated H&N PET/CT images when available (88%; 275 of 313) and WB images if not (12%; 38 of 313). We show the 2×2 cross-tabulation of the best available FDG-PET/CT results versus pathology results for NO sides of necks (Table 2). Next, we assessed imaging results for the participants who all had dedicated H&N FDG-PET/CT (Table 2) and show the 2×2 cross-tabulation. The results are presented for NO sides of necks.

NPV and Combined Reader Visual Results

NPV was approximately 0.87 for visual reading with CIs of 0.12 in length. We show the results for both the best available PET/CT images and the dedicated H&N PET/CT images (Table 3).

Concordance Among Readers

The Data Supplement shows the 2×2 cross-tabulations for the visual and quantitative SUVmax assessments when all pairs of readers are combined. Presented with the table are the overall percentages of concordance and 95% multi-stage bootstrap CIs using 10,000 replications. For visual assessment, 313 sides of necks were analyzed from 242 participants. Combining across all pairs of readers, 241 sides of necks were classified the same out of 313 total sides of necks. The overall percentage of visual assessment concordance was 77.0% (95% CI, 71.8% to 82.0%). The concordances for the SUVmax assessments were 91%,

TABLE 2. Results of the FDG-PET/CT Imaging and Pathology

NO Sides of Neck With Pathology Results	Pathology, No.		
	Negative	Positive	Total
Best available FDG-PET/CT			
Negative	125	19	144
Positive	70	56	126
Total	195	75	270
Head and neck FDG-PET/CT			
Negative	106	16	122
Positive	65	47	112
Total	171	63	234

Abbreviations: CT, computed tomography; FDG, [¹⁸F]fluorodeoxyglucose; PET, positron emission tomography.

TABLE 3. Visual Assessment NPV Estimate With Its 95% CI

Scan	NPV (fraction; 95% CI)
Best available FDG-PET/CT scans	
All sides of necks (n = 305)	0.873 (137/157; 0.810 to 0.928)
NO sides of necks (n = 270)	0.868 (125/144; 0.803 to 0.925)
H&N FDG-PET/CT scans only	
All sides of necks (n = 267)	0.880 (117/133; 0.815 to 0.937)
NO sides of necks (n = 234)	0.869 (106/122; 0.798 to 0.932)

Abbreviations: CT, computed tomography; FDG, [¹⁸F]fluorodeoxyglucose; H&N, head and neck; NPV, negative predictive value; PET, positron emission tomography.

92%, 93%, and 97% using cutoffs of 1.8, 2.0, 2.5, and 3.5, respectively.

NPV by SUVmax Cut Points

Table 4 shows the overall NPVs and 95% CIs that were derived from SUVmax values of the nodal basins of the neck regions. In general, the NPVs from the prespecified and optimal cutoffs were 0.937 or greater. Figure 2 shows examples of PET/CT images from study participants. One participant (C) had a true-positive PET/CT on the basis of SUVmax and a false-negative PET on the basis of visual reading and provides an example of the causes of differences in the respective NPV performance. Subgroup analyses of NPV values by tumor stage and location are shown in the Data Supplement and show no difference ($P > .05$). The overall false-positive rate was 10%, with the highest false-positive rate by nodal region in level IIA (approximately 26%; Data Supplement).

Impact on Change in Surgical Treatment Plan

Of the 242 eligible participants with PET/CT submitted, we received documentation about any possible change in surgical plan in 237. Of the five participants without documentation, one had surgery elsewhere, two decided not to have surgery, and two had unknown surgery status. Without the documentation, we do not know whether the

PET results influenced these decisions. The post-PET/CT surgical treatment plan compared with the pre-PET/CT surgical treatment plan was changed in 51 of 237 participants (21.5%; exact 95% CI was 16.5% to 27.3%) on the basis of the PET/CT findings. Six more patients (not among the 51) who did not have nodal dissection in the surgical plan after the PET reported that the change was not because of the PET findings. Among these patients, one died, three refused treatment, one had chemo-radiation instead of surgery, and one had abdominal metastasis.

In terms of nodal level, there were 2,424 nodal levels from 303 sides of necks with pre-PET/CT and post-PET/CT documentation of the surgery plan. A total of 48 of 2,424 (1.9%; exact 95% CI, 1.46% to 2.62%) nodal basins were added to the surgery plan and 76 (3.1%; exact 95% CI, 2.48% to 3.91%) were removed from the surgical plan after the PET/CT relative to the plan for surgery pre-PET/CT. At a patient level, in 34 of 51 patients, this led to planned dissection of additional nodal levels; in six of 51 patients, this led to planned dissection of fewer nodal levels; in four of 51 participants, it led to both additional and fewer planned dissection of nodal levels; and in one participant, the details are unknown. In six of 51 participants, the surgery was cancelled. The following reasons were reported for each of these six patients, influenced by PET findings: (1) the PET scan showed a larger tumor, (2) radiotherapy was preferred because of extended lymphatic metastasis, (3) the PET scan showed lung cancer, (4) chemoradiation was preferred, (5) surgery was medically contraindicated because of the extent of tumor, and (6) the patient had locally advanced disease. Possible new distant metastases or other primaries (no biopsies were performed as part of the study of these sites) on a per-patient level or possible new contralateral or retropharyngeal lymph nodes seen on PET/CT, as reported by any of the readers, were seen in lung (n = 15), breast (n = 1), bone (n = 1), colon (n = 3), thyroid (n = 3), regions suggestive of lymphoma (n = 1), parotid (n = 1), distant lymph nodes (n = 1), multiple locations (n = 4), and

TABLE 4. NPV by SUVmax Values

SUVmax Cutoff Value	Regression NPV (fraction; 95% CI)	
	Best Available Scans	H&N Scans Only
SUVmax < 1.8*	0.942 (1,618/1,718; 0.930 to 0.953)	–
SUVmax < 2.0†	0.941 (1,623/1,724; 0.930 to 0.953)	0.945 (1,418/1,500; 0.930 to 0.961)
SUVmax < 2.5†	0.940 (1,646/1,751; 0.928 to 0.952)	0.945 (1,439/1,522; 0.930 to 0.961)
SUVmax < 2.6*	–	0.946 (1,442/1,525; 0.931 to 0.961)
SUVmax < 3.5†	0.937 (1,738/1,855; 0.925 to 0.949)	0.942 (1,522/1,616; 0.926 to 0.958)

Abbreviations: H&N, head and neck; NPV, negative predictive value; SUVmax, maximum standardized uptake value.

*Optimum cutoff was identified from Youden index in receiver operating characteristic after imputing the missing SUVmax as 1.5 (background) for the nodal basins when their malignancy level was classified as Probably benign, Definitely benign, or No nodes seen by the central readers. The optimal SUVmax cutoff of 1.8 identified on the best available scans was not applied to the H&N-scans-only set and, similarly, for the optimal SUVmax cutoff of 2.6 identified on the H&N scans only.

†Prespecified cutoffs.

FIG 2. Participant examples. Computed tomography (top) and positron emission tomography (bottom) images of four participants are shown. True-positive (TP), true-negative (TN), and false-negative (FN) examples are shown. One example (C) was TP by maximum standardized uptake value (SUVmax) and FN by visual reading. Nodal descriptions by level and size are shown (lymph nodes or region indicated on images; orange arrows on computed tomography and blue arrows on positron emission tomography). Pathology findings and SUVmax values are shown. SCC, squamous cell cancer.

contralateral (n = 10; five biopsy proven, five not biopsied) and retropharyngeal lymph nodes (n = 1; not biopsied)."

DISCUSSION

Our primary aim was to determine the NPV for PET/CT for the NO neck. The NPV of PET/CT using visual interpretation (NPV, approximately 0.87) specific to the clinical-NO side and SUV analysis (NPV, approximately 0.94) specific to the nodal basins was high. Previous studies have shown a high NPV for FDG-PET/CT for the NO neck in single-institution series,²³⁻²⁵ with some other single-institution data showing lower NPVs (NPV, approximately 65%).²⁶ To our knowledge, this is the first prospective, multicenter study to show that the NPV of FDG-PET/CT is 87% or greater. The PET/CT reader agreement was approximately 80% for visual analysis of the neck. Using the best available PET/CT scan results, 125 of 144 dissected NO neck sides that had a negative PET scan were pathologically negative, whereas

19 of 144 that had negative PET/CT scans were positive. In addition, surgeons changed the surgical treatment plan in 22% of participants after PET/CT results compared with the pre-PET/CT surgical treatment plan.

Elective neck dissections are often performed in high-risk participants with NO necks because clinical examination and structural imaging do not reliably identify all metastatic disease.²⁷⁻³⁰ The risk of morbidities is 2% for participants undergoing dissection.³¹ Clinical follow-up with close observation for low-risk participants is typical.^{1,32-35} Some authors have reported that for elective neck dissection in patients with advanced T3 to T4 disease, 5-year overall survival rates were 58% in elective neck dissection participants and 60% in observation participants.¹ Others have shown in a prospective trial that elective neck dissection in participants with T1 or T2 oral squamous cell carcinoma is associated with improved 3-year overall survival versus watchful waiting, with nodal dissection for relapse (80% v

68%).³⁶ With 20% to 30% of NO participants demonstrating neck disease pathologically,⁶⁻⁸ the majority of patients with NO necks undergo a neck dissection without benefit.

CT, MRI, and FDG-PET/CT can be used to determine the extent of disease, with FDG-PET/CT being the most sensitive for lymph node metastasis in most studies.^{12-17,27,37-40} Some authors have stated that there is a need for prospective, randomized studies regarding elective neck dissection.¹ Prior studies have demonstrated that PET/CT can identify metastatic H&N malignancy in patients with NO neck not discovered by the other two imaging techniques.⁴¹⁻⁴³ This suggests that disease classification and treatment plans could be modified appropriately using PET/CT, leading to better outcomes. These data compare favorably with sentinel lymph node biopsy that has a reported NPV of 81% to 100% (mean NPV, 95%).⁴⁴

Single-institution studies and modeling paradigms suggest that PET/CT may be better able to characterize the NO neck, although there is disagreement in the literature.^{18,23,45-51} None of the studies have sufficient sample size to provide adequate CIs for their results, and many included varied patient groups, with both untreated and recurrent disease, as well as various tumor histologies. This study attempted to respond to these weaknesses in the published literature, and our results show that the NPV of PET/CT was high ($\geq 87\%$) for the clinical NO neck in a multicenter, homogeneous population of participants with HNSCC.

We used visual analysis criteria of FDG uptake in a node (above blood pool uptake) to determine whether a node was positive or negative for metastasis. In addition, we investigated the accuracy of quantitative parameters; arbitrary SUVmax of 2.0, 2.5, and 3.5; and a statistically determined optimal value of 1.8 for best available images (WB and dedicated H&N) and 2.6 for dedicated H&N images. These cut points produced similar NPVs (0.937 to 0.942) for NO and were higher than the NPV for visual analysis, although the SUVmax values were determined by nodal levels, which is more favorable given a greater number of neck levels. This has practical implications for clinical interpretations and quantitative imaging in clinical practice. Readers can use a combined approach of visual analysis and an SUVmax cut point of less than 1.8 to 2.0 to accurately assess the neck to exclude nodal metastases. However, it is acknowledged that SUVmax values can be affected by many factors, such as uptake time, acquisition time, and reconstruction methods, and it would be

important to adhere to similar scanning methods as those used in this study or develop appropriate transformations to apply the cut points. The optimal SUVmax values tend to be relatively low compared with other published data, likely a result of the small nodal size selection bias from NO eligibility defined in the study and the dedicated neck image SUVmax slightly greater than best available due to delayed imaging and dedicated acquisition parameters. Nevertheless, this SUVmax cut point still produced a false-positive ratio of 10% and therefore cannot prevent all unnecessary neck dissections.

This study has several strengths. It reflects a case mix of cancers and imaging equipment found in the community. Our data represent a practical application of PET/CT to the NO clinical scenario and is not constrained by artificial inclusion criteria. The decision to prophylactically dissect the neck before knowing PET/CT findings and then making changes once knowing the PET/CT findings were not scripted by the study protocol but were left to the treating surgeons (intent to treat). Central image reading was performed after surgery to ensure use of defined parameters of abnormality. It provides the benefits of being a multicenter study with standardized methodology that can be used in the community.

The weaknesses of this study include lack of central pathology review of all patients. This was a known design weakness that was necessary to manage results quickly. A central pathology service would have been logistically and cost prohibitive and was challenging in the recent past (F. Civantos, personal communication, July 21, 2008).

The findings of this work suggest that PET/CT adds additional direction to NO neck treatment and provides a high NPV that may aid clinicians in making surgical planning decisions. The study showed that surgeons changed treatment plans on the basis of the PET/CT results compared with pre-PET/CT surgical treatment plan in some participants.

In conclusion, PET/CT has a high NPV for NO HNSCC. SUV analysis is superior to visual assessment with regard to NPV. There is a high degree of reader agreement for PET/CT of the patient with an NO neck. These findings suggest that FDG-PET/CT may assist the clinician in deciding on the best therapy for the clinically NO neck in HNSCC. Well-designed clinical trials should be performed to test the outcome of omitting neck dissection by using PET/CT.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST AND DATA AVAILABILITY STATEMENT

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST**Multicenter Trial of [¹⁸F]fluorodeoxyglucose Positron Emission Tomography/Computed Tomography Staging of Head and Neck Cancer and Negative Predictive Value and Surgical Impact in the NO Neck: Results From ACRIN 6685**

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