

# Unsuspected axillary lymph node metastasis of nasopharyngeal and cervical cancer on $^{18}\text{F}$ FDG PET/CT: a case report

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[Received 26 XII 2015; Accepted 18 VIII 2016]

## Abstract

Axillary lymph node metastasis (ALNM) from cancer except breast cancer is rare. Whole body  $^{18}\text{F}$ -Fluorodeoxyglucose positron emission tomography/computed tomography (PET/CT) that simultaneously offers anatomic and metabolic information is widely used and has become an effective modality in many clinical fields, especially oncology, and also may detect an unexpected metastasis. We report two cases of ALNM of nasopharyngeal and cervical cancer that was detected on whole body PET/CT.

**KEY words:** axillary lymph node metastasis,  $^{18}\text{F}$ FDG PET/CT, nasopharyngeal cancer, cervical cancer

Nucl Med Rev 2016; 19, Suppl. B: B20–B21

## Background

$^{18}\text{F}$ -Fluorodeoxyglucose positron emission tomography/computed tomography (PET/CT) assesses tumor metabolic activity. It is a useful tool in a variety of cancers [1]. PET/CT also may detect incidental metastasis due to whole body image [2, 3]. Axillary lymph node metastasis (ALNM) from cancer, except breast cancer is rare. Only a few cases of ALNM from nasopharyngeal and cervical cancer have been described. This case report describes cases of unsuspected ALNM from nasopharyngeal cancer (NPC) and cervical cancer (CC) confirmed with PET/CT imaging and subsequent biopsy.

## Case report

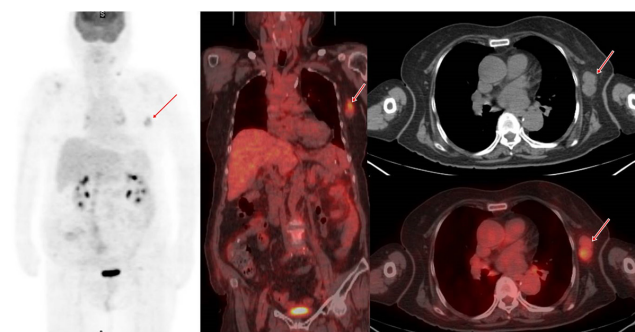
### Case 1

A 64-year-old woman had a past medical history of combined chemo-radiotherapy for squamous cell carcinoma in the cervix with stage IVb (T4N1M1, ovarian metastasis) 6 years previously, with chemotherapy due to recurrence in the para-aortic lymph nodes one year later. She had been free of disease for 5 years with annual follow-up study using enhanced abdominal CT scan. PET/CT was performed to detect tumor recurrence or metastasis of known cervical cancer and other hidden malignancy. PET/CT revealed a nodular lesion with FDG uptake, with a maximum standardized uptake value ( $\text{SUV}_{\text{max}}$ ) of 3.97 in the left axilla (Figure 1). Biopsy

was performed under ultrasonographic guidance. Metastatic lesion from CC was confirmed by microscopic examination of the specimen.

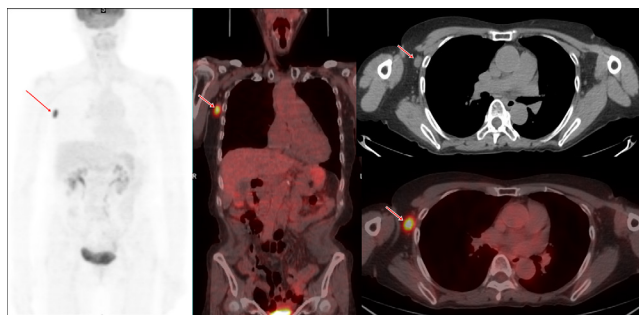
### Case 2

A 64-year-old woman had a past medical history of combined chemo-radiotherapy for squamous cell carcinoma in the nasopharyngeal wall with stage IVA (T4N1M0) 12 years previously and radical neck dissection due to recurrence in the cervical lymph nodes two years later. She had been free of disease for 11 years with annual follow-up study of physical examination of head and neck areas and enhanced neck CT scan. PET/CT was performed to detect tumor recurrence or metastasis of known nasopharyngeal cancer and other hidden malignancy. PET/CT showed nodular lesion with FDG uptake, with  $\text{SUV}_{\text{max}}$  of 8.07 in the right axilla (Figure 2). Biopsy



**Figure 1.** Whole body  $^{18}\text{F}$ FDG PET/CT in MIP, coronal and transaxial views demonstrated an isolated hypermetabolic focus in left enlarged axillary lymph node ( $\text{SUV}_{\text{max}}$  3.97, red arrow)

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**Figure 2.** Whole body <sup>18</sup>F-FDG PET/CT in MIP, coronal and transaxial views demonstrated an isolated hypermetabolic focus in right enlarged axillary lymph node (SUV<sub>max</sub> 8.07, red arrow)

was performed under ultrasonographic guidance. Metastatic lesion from NPC was confirmed by microscopic examination.

## Discussion

CC is the second most common cancer among women globally and is a leading cause of cancer mortality [4]. In a previous study, 30 women with locally advanced tumors who had undergone PET/CT during the surveillance period were evaluated. PET/CT facilitated the detection of local and distant metastasis with a sensitivity of 93–96% and a specificity of 93–95% [5]. The route of LNM from the abdominal para-aortic lymph nodes of CC is first to the cisterna chyli and then to the thoracic duct. The thoracic duct empties into the venous system at the junction of the left subclavian and internal jugular veins. Before emptying into the venous system, the thoracic duct arches above the clavicle and incorporates the scalene lymph nodes into the efferent lymph flow [6]. But ALN falls outside of this lymphatic flow. ALN normally receives lymphatic drainage from the upper limbs and chest wall. One hypothesized route of ALNM from bronchogenic carcinoma is the systemic vascular route, considering that there are no channels of lymphatic communication from the lungs to the ALN [7, 8]. One of the present cases conformed to this hypothesis.

NPC often develops regional and distant metastases [9]. Supraclavicular nodal metastases represent the most advanced extent of regional spread [10] and are associated with a greater than 50% risk of distant metastases after curative-intent local-regional therapy. The skeletal system, the thorax and the liver are the most frequent sites of distant metastatic spread in NPC [11]. The orderly spread of nodal metastases in the cephalad-caudal direction in NPC [12] suggests the possibility that the superior mediastinal and axillary nodes could be the next station for lymphatic spread after supraclavicular nodal metastases [13]. Recurrence and metastasis are commonly seen after the initial treatment of advanced NPC, which can lead to the failure of first-cycle radiotherapy in up to 25% of cases. Moreover, distant metastasis is the primary reason for failure, accounting for 53.6–63.1% of recurrence [14]. One of the present cases featured a high stage and recurrence in one year.

PET/CT is a useful method for detection of local recurrence and distant metastasis compared with conventional anatomical imaging [15]. The potential role of PET/CT in the management of NPC and

CC might be its ability to image the entire body for additional site of metastatic disease. In these cases, enhanced neck and abdominal CT scans for follow-up of NPC and CC did not detect ALNM.

## Conclusions

To our knowledge, this is the first report of a NPC and CC developing an ALNM on F-18 FDG PET/CT. These cases represent rare presentation of recurrent NPC and CC, and illustrate the importance of a comprehensive physical examination and correlation with whole body PET/CT when following high stage patients over time.

## Conflict of Interest

Author declares that he has no conflict of interest.

## Acknowledgement

None.

## Reference

1. Kostakoglu L, Goldsmith SJ. 18F-FDG PET evaluation of the response to therapy for lymphoma and for breast, lung, and colorectal carcinoma. *J Nucl Med* 2003; 44: 224–239.
2. Kang S, Song BI, Lee HJ et al. Isolated facial muscle metastasis from renal cell carcinoma on F-18 FDG PET/CT. *Clinical nuclear medicine* 2010; 35: 263–264.
3. Mosci C, McDougall IR, Jeffrey RB et al. 18F-FDG PET/CT demonstration of a liver metastasis in a patient with papillary thyroid cancer. *Clin Nucl Med* 2012; 37: e234–e236.
4. Ferlay J, Parkin DM, Steliarova-Foucher E. Estimates of cancer incidence and mortality in Europe in 2008. *Eur J Cancer* 2010; 46: 765–781.
5. Mitra E, El-Maghraby T, Rodriguez CA et al. Efficacy of 18F-FDG PET/CT in the evaluation of patients with recurrent cervical carcinoma. *Eur J Nucl Med Mol Imaging* 2009; 36: 1952–1959.
6. Buchsbaum HJ. Extrapelvic lymph node metastases in cervical carcinoma. *American journal of obstetrics and gynecology* 1979; 133: 814–824.
7. Riquet M, Le Pimpec-Barthes F, Danel C. Axillary lymph node metastases from bronchogenic carcinoma. *Ann Thorac Surg* 1998; 66: 920–922.
8. Marcantonio DR, Libshitz HI. Axillary lymph node metastases of bronchogenic carcinoma. *Cancer* 1995; 76: 803–806.
9. Petrovich Z, Cox JD, Middleton R et al. Advanced carcinoma of the nasopharynx. 2. Pattern of failure in 256 patients. *Radiother Oncol* 1985; 4: 15–20.
10. Teo P, Yu P, Lee WY et al. Significant prognosticators after primary radiotherapy in 903 nondisseminated nasopharyngeal carcinoma evaluated by computer tomography. *Int J Radiat Oncol Biol Phys* 1996; 36: 291–304.
11. Leung SF, Teo PM, Shiu WW et al. Clinical features and management of distant metastases of nasopharyngeal carcinoma. *J Otolaryngol* 1991; 20: 27–29.
12. Sham JS, Choy D, Wei WI. Nasopharyngeal carcinoma: orderly neck node spread. *Int J Radiat Oncol Biol Phys* 1990; 19: 929–933.
13. Leung S, Cheung H, Teo P et al. Staging computed tomography of the thorax for nasopharyngeal carcinoma. *Head Neck* 2000; 22: 369–372.
14. Chen JL, Huang YS, Kuo SH et al. Intensity-modulated radiation therapy for T4 nasopharyngeal carcinoma. *Treatment results and locoregional recurrence. Strahlenther Onkol* 2013; 189: 1001–1008.
15. Park JW, Jo MK, Lee HM. Significance of 18F-fluorodeoxyglucose positron-emission tomography/computed tomography for the postoperative surveillance of advanced renal cell carcinoma. *BJU Int* 2009; 103: 615–619.