Reliability of SPECT-CT lymphoscintigraphy compared to PET-CT for uncommon cancer cells migration in initially N0 velum neoplasia

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Abstract
Introduction
A man with a squamous cell carcinoma of the left velum was staged cT1N0M0 by PET-CT. SPECT-CT lymphoscintigraphy revealed unusual retropharyngeal sentinel station. The aim of this case report is to show that uncommon migration cells can appear in velum neoplasia and that SPECT-CT lymphoscintigraphy can help us to objectify them.

Case report
Preoperative SPECT-CT lymphoscintigraphy revealed 2 sentinel stations: one usual in level II left and another unusual, in left retropharyngeal level. Due to the potentially harmful surgical access, the retropharyngeal level was not removed. Level II sentinel node was removed and disease free. Six month after surgery, follow-up PET-CT showed left retropharyngeal recurrence.

Conclusion
This event shows that lymphoscintigraphy combined to a SPECT-CT can predict the uncommon lymphatic migration in velum neoplasia.

Introduction
Velem neoplasia is very rare and accounts for approximately 2% of head and neck mucosal malignancies. However, this type of cancer is squamous cell carcinoma (SCC) for 80%. This histological type presents high incidence of second primary tumour associated with tumours of this site, synchronous or metachronous. Nonsquamous malignancies account for the other 20%. It is important to specify that there is a strong correlation between smoking cigarettes and drinking alcohol and the apparition of SCC.

Common sites of tumour extension of velum SCC are hard palate, tonsils, retro molar trigone, inferior or superior alveolar process and base of tongue. For the lymph node involvement, the first echelons of nodal drainage are submandibular nodes (level I) and upper deep jugular lymph nodes (level II). They are really the most viewed invaded areas. However, retropharyngeal nodes may be involved but are not very common.

Imaging work-up for this type of pathology include essentially computed tomography (CT) scanning and magnetic resonance imaging (MRI). CT scanning is commonly used to object the local extension and the MRI for an accurate view of perineural invasion. The cervical node involvement is assessed with CT scanning with intravenous contrast infusion. PET-CT is commonly used for the distant staging and can replace CT when it is used with head and neck window.

Soft palate tumours are quite easily diagnosed but their treatments are uneasy due to the difficulty to specify lymph node involvement with precision. One of the others difficulties to make a treatment choice is that velum is important for deglutition and phonation and present very difficult revalidation after surgery. For early diseases (T1 and T2) without node involvement, surgery or radiotherapy alone can give a very good control. For advanced velum neoplasia (T3-4 or Tx with node involvement), the prognostic is worst and combined treatments are recommended (surgery followed by radiotherapy or radiochemotherapy followed sometimes by surgery).

This case report wants to show that uncommon migration cells can appear at very unexpected moment and that SPECT-CT lymphoscintigraphy (LS) can preciously help us to objectify them at the time of diagnosis.

Case report
A tumour of the left velum was diagnosed in a fifty-one years old man with chronic alcohol and tobacco abuse. Biopsy confirmed the diagnosis of squamous cell carcinoma. A PET-CT is realised for the metastatic staging and is also viewed in head and neck window. It confirmed this tumour of the left velum which extended to the intermaxillary commissure without tomodensitometric traduction. Two hypometabolic enlarged nodes of 12 mm are objected. The first was SUV 2.8 and noticed in level Ib was in level IIb left. Anyway, a very hypometabolic left retropharyngeal (base of skull) area is presenting SUV lower than 1 (Figure 1). Due to the fact that there were any tomodensitometric traduction noted for this image and lower level of SUV, this result was assimilated to noise. Then, no other pathological location was observed and disease was staged cT1N0M0. Due to the clinical stage and without contraindication of surgery, a left

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References

Discussion
Velum squamous cell carcinoma clinically staged cN0 are still at high risk of occult nodes micro metastases (18 to 45 % according to modern surgical series). Prophylactic dissection or irradiation of the node levels being statistically at high risk of invasion is recommended. Anyway, 15 to 30 % of tumors potentially drain in unpredicted nodal basins⁴. The presence of early nodal metastasis predict very bad prognosis by increasing levels of recidive at all levels (primitive site, regional site and metastases).

The SLN technique coupled to a SPECT-CT LS imaging preoperatively allows to spatially locate the individual draining basin⁵,⁶. For our patient, it appeared that SLN mapping through SPECT-CT lymphoscintigraphy correctly predicted the uncommon migration of cancer cells from soft palate to high retropharyngeal nodes. Retrospectively, this nodal region should have been surgicallly or irradiated at prophylactic dose (i.e. 50 Gy). This observation led us to design a phase I/II study to determine the potential place of SPECT-CT LS for nodes prophylactic radiotherapy in cN0 HNSCC patients.

Conclusion
SPECT-CT LS imaging is a reliable technique to locate migration of cancer cells from soft palate. Coupled to SLN technique, it allows to accurate the mapping of draining basens. These data show us that cancer treatment needs a multidisciplinary approach.

Consent
Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Abbreviations list
SCC: Squamous Cell Carcinoma
CT: Computed Tomography
MRI: Magnetic Resonance Imaging
PET: Positron Emission Tomography
SUV: Standardized Uptake Value
SPECT-CT: Single Photon Emission Computed Tomography
SLN: Sentinel Lymph Node
LS: Lymphoscintigraphy
HNSCC: Head and Neck Squamous Cell Carcinoma

Figure 1: PET-CT «Month 0»: left retropharyngeal station shows SUV lower than 1 without tomodensitometric traduction. SPECT-CT «Month 0»: left retropharyngeal station shows SUV lower than 1 without tomodensitometric traduction. PET-CT «Month 6»: large hypermetabolic lesion in the left retropharyngeal area (SUV=20).