

Case Report

Alternating increased unilateral vocal cord uptake in a patient with metastatic breast cancer

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Abstract

We present a 58 year old female with stage IV breast cancer, status bilateral mastectomies that underwent FDG PET/CT for evaluation of extent of disease. The PET scan shows increased uptake in the left vocal cord (SUV max 3.9), consistent with right vocal cord paralysis presumably from a hypermetabolic right paratracheal node involving the recurrent laryngeal. Clinically hoarseness was confirmed and intermittent aspiration of liquids led to treatment with injection of CAHA in the right vocal cord.

A follow up restaging scan performed a year after the initial scan showed FDG uptake in the injected vocal cord overlying the area of dense material in the injected side (SUVmax 9.2) and resolution of previously noted hypermetabolic metastasis in the paratracheal region and bone metastasis(data not shown).

Introduction

Vocal cord paralysis(VCP) is a fairly common and usually a harbinger of an underlying significant illness. Unilateral increased FDG uptake in the unaffected cord is a common pitfall and have sometimes been misinterpreted as primary or secondary malignancy especially in the pre-PET/CT era. Additionally, local injection therapies for VCP can cause pitfalls and complicate the interpretation.

Case report

We present a 58 year old female with stage IV breast cancer, status bilateral mastectomies who underwent FDG PET/CT for follow up. The PET scan showed increased uptake in the left vocal cord (SUV max 3.9), consistent with right vocal cord paralysis presumably from a hypermetabolic right paratracheal node involving the recurrent laryngeal nerve (Figure 1A). Post-treatment axial PET, CT and fused PET/CT images showed focal intense FDG uptake in the right vocal cord at the CAHA injection site(SUV 9.2) (Figure 1B). Baseline FDG PET/CT scan showed a hypermetabolic right paratracheal adenopathy, the possible culprit for recurrent laryngeal nerve palsy.

Literature review and discussion

In a retrospective study, Chen et al have reported neoplastic disease as the second most common cause of VCP [1], with the traumatic causes being the most common cause. The unilateral increased FDG uptake in the unaffected, non-paralyzed vocal cord has been well demonstrated [2] and attributed to compensatory increased workload of the normal vocal cord. To improve symptoms, medialization of the vocal cord is often performed using a variety of materials including teflon, fat, collagen, hyaluronic acid, calcium hydroxyapatite gel(CAHA), and polydimethylsiloxane gel. Some of these injections have been associated with increased FDG uptake in the ipsilateral injected vocal cord [3,4] (Figure 2).

Blodgett *et al.* [5] have summarized common physiologic

variants and pitfalls of combined PET/CT in the head and neck in an excellent review. It is important to distinguish unilateral vocal cord uptake from vocal cord neoplasms. This patient illustrates both the physiologic contralateral normal vocal cord uptake during vocal cord paralysis as well as the ipsilateral uptake due to inflammatory changes associated with vocal cord injections. Vocal cord injection is a valuable procedure for the treatment of VCP. Materials for augmentation

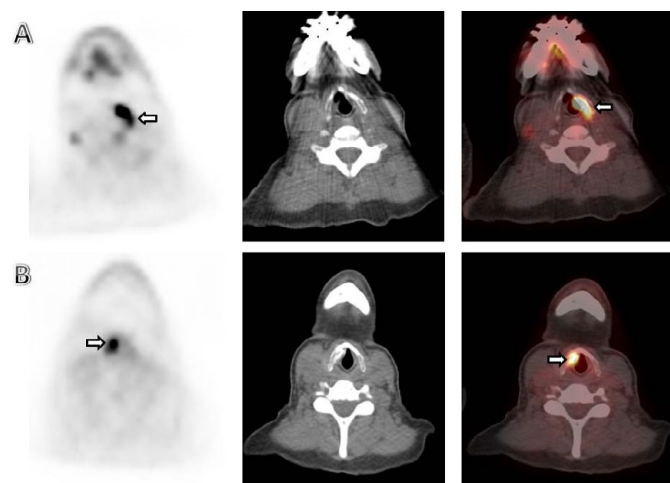


Figure 1. (A) The PET scan showing increased uptake in the left vocal cord (SUV max 3.9), consistent with right vocal cord paralysis.

(B) Post-treatment axial PET, CT and fused PET/CT images showing focal intense FDG uptake in the right vocal cord at the CAHA injection site(SUV 9.2).

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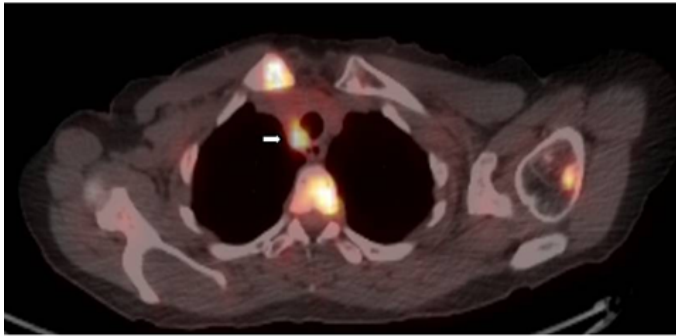


Figure 2. Baseline axial fused PET/CT imaging showing focal intense uptake in the right paratracheal adenopathy, measuring 1.7 × 1.3 cm with encroachment of the trachea (SUV 7.9).

are usually classified as either temporary or permanent/long lasting. Long lasting or permanent materials include autologous fat, CAHA, particulate silicone and Teflon. Examples for temporary materials include bovine gelatin, collagen based products, hyaluronic acid and carboxymethylcellulose [6]. Some of the materials can cause substantial immunologic reaction at the injection material [7]. Several case reports have been published, illustrating increased FDG uptake associated with Teflon injection [4,8]. Increased FDG uptake in the injected vocal cord is probably due to a granulomatous reaction and may mimic laryngeal cancer [9]. CAHA used as a volumizing filler is known commercially as Radiesse® (Bioform Inc, San Mateo, Calif), although canine models have failed to show foreign body reaction to CAHA, Tanna *et al.* and others have reported serious foreign body reaction which required partial removal of the CAHA material [10]. A few case reports have described focal intense FDG uptake in the paralyzed vocal cord due to previous injection of CAHA [11-13].

Our case is unique in that it demonstrates two important pitfalls in the same patient and supports the fact that CAHA injection may cause paradoxical focal intense FDG uptake in the paralyzed cord.

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