PHYSIOLOGICAL UPTAKE OF SOFT TISSUE IN POSITRON EMISSION TOMOGRAPHY MAY MIMIC LOCAL RECURRENCE OF NASOPHARYNGEAL CARCINOMA: A CASE REPORT

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This paper reported a case of post-radiation nasopharyngeal carcinoma whose follow-up positive emission tomography / computed tomography (PET/CT) scan showed physiological uptake in bilateral neck soft tissue. This image pattern mimicked local recurrence. Biopsy revealed no malignant cells. One-year follow-up showed free of recurrence.

PET/CT scan has been increasingly used in oncology. Physiological uptake may happen in soft tissues of neck such as muscles, fat, tonsils, lateral pharyngeal recess and salivary glands. Physiological uptake may mimic local recurrence and cause false-positive reading. Standard uptake value (SUV), image pattern and morphology change may help in differential diagnosis.

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Key words: PET/CT, Nasopharyngeal carcinoma, Local-regional recurrence

INTRODUCTION

PET scan has been increasingly used in oncology for staging various cancers, evaluating cancer treatment response, target delineation in radiotherapy plans, detecting local recurrence or distant metastases [6]. When F-18-fluorodeoxyglucose (FDG) is injected into the body, FDG is transported into the tumor cells by glucose transporter membrane proteins (Glut-1 to Glut-5). Glut-1 is particularly expressed in many tumors [8]. Intracellular FDG is converted to FDG -6-phosphate by hexokinase. Unlike glucose, FDG does not enter further metabolism because of its negative charge; it remains trapped in tissue. Glucose-6-phosphatase mediated dephosphorylation occurs slowly in myocardium, brain and many tumors which have low concentration of this enzyme and therefore the accumulation of 18FDG -6-phosphate is proportional to glycolytic rate. Conversely, tissues such as resting skeletal muscle, liver, kidney and intestine with high glucose-6-phosphatase activity may show lower activity. Due to higher glycolytic rate and lower glucose-6-phosphatase level in tumor cells, malignant tumor should “flare” up in PET scan. We present a case of NPC that shows significant...