Pelvic Congestion Syndrome Initially Detected by Contrast-Enhanced F-18 FDG-PET/CT

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Pelvic congestion syndrome (PCS) is said to occur as a result of retrograde flow in an incompetent ovarian vein. Ovarian vein incompetence is seen in approximately 10 % of women, and up to 60 % with this abnormality can develop PCS [1]. The etiology of PCS is poorly understood and is likely to be multifactorial. Absence of ovarian vein valves is an important factor in its development [2]. The causes of ovarian varicocoeles are multifactorial, involving both mechanical and hormonal factors. Dilatation of the ovarian veins can result in vascular incompetence and retrograde blood flow [3].

On either CT or magnetic resonance (MR) imaging studies, pelvic varices in PCS appear as dilated, tortuous, enhancing tubular structures near the ovaries and uterus [4]. In addition, the extension of varices to the broad ligament and paravaginal venous plexus can be appreciated [5]. With CT, the tubular nature of these structures and the pattern of enhancement after intravenous contrast medium administration distinguish them from lymphadenopathy

or adnexal masses [6]. Unlike such masses, pelvic varices appear isodense with other veins after contrast enhancement [7].

Contrast-enhanced CT data as part of the combined PET/CT examination provide additional information when compared with non-enhanced PET/CT. Because CT data supply the anatomic background for PET, the most important benefit relates to more precise anatomic localization of pathology by differentiation of the lesion from its surrounding structures [8]. By supporting lesion detection and characterization, CT contrast agents can be of additional value in F-18 FDG non-avid disease [9]. As in the presented case, careful review of CT images in contrast-enhanced PET/CT enables the detection of F-18 FDG non-avid disease such as PCS (Fig. 1). As contrast-enhanced F-18 FDG PET/CT had been performed frequently, being familiar with the findings of PCS on the contrast-enhanced CT images would have been helpful for the nuclear medicine physicians.

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Fig. 1 We present the case of 52-year-old female patient with a history of the rectal carcinoid tumor. The patient underwent endoscopic resection of a rectal mass lesion. Subsequently, the patient underwent an F-18 fluorodeoxyglucose positron emission tomography/computed tomography (FDG PET/CT) scan with an intravenous contrast-enhancement agent to stage the rectal malignancy. The PET/CT scan revealed physiologic uptake of the rectum and mild blood pool activity of dilated pelvic vessels (**a**). However, on the CT images of the F-18

FDG PET/CT scan, tortuous and dilated veins were detected in the uterus and both ovaries (**b**). Internal and external iliac arteries were also dilated. The patient was referred to the department of gynecology for evaluation of dilated pelvic veins. The detailed investigation of the clinical history revealed that the patient had suffered from post-coital pain, intermittent dull pelvic pain and urinary frequency. The final diagnosis was pelvic congestion syndrome (PCS)

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References

1. Belenky A, Bartal G, Atar E, Cohen M, Bachar GN. Ovarian varices in healthy female kidney donors: incidence, morbidity, and clinical outcome. *AJR Am J Roentgenol*. 2002;179:625–7.
2. Ignacio EA, Dua R, Sarin S, Harper AS, Yim D, Mathur V, et al. Pelvic congestion syndrome: diagnosis and treatment. *Semin Intervent Radiol*. 2008;25:361–8.
3. Ganeshan A, Upponi S, Hon LQ, Uthappa MC, Warakaulle DR, Uberoi R. Chronic pelvic pain due to pelvic congestion syndrome: the role of diagnostic and interventional radiology. *Cardiovasc Intervent Radiol*. 2007;30:1105–11.
4. Freedman J, Ganeshan A, Crowe PM. Pelvic congestion syndrome: the role of interventional radiology in the treatment of chronic pelvic pain. *Postgrad Med J*. 2010;86:704–10.
5. Karaosmanoglu D, Karcaaltincaba M, Akata D, Ozmen M. Unusual causes of left renal vein compression along its course: MDCT findings in patients with nutcracker and pelvic congestion syndrome. *Surg Radiol Anat*. 2010;32:323–7.
6. Rozenblit AM, Ricci ZJ, Tuvia J, Amis Jr ES. Incompetent and dilated ovarian veins: a common CT finding in asymptomatic parous women. *AJR Am J Roentgenol*. 2001;176:119–22.
7. Desimpelaere JH, Seynaeve PC, Hagers YM, Appel BJ, Mortelmans LL. Pelvic congestion syndrome: demonstration and diagnosis by helical CT. *Abdom Imaging*. 1999;24:100–2.
8. Antoch G, Freudenberg LS, Beyer T, Bockisch A, Debatin JF. To enhance or not to enhance? 18F-FDG and CT contrast agents in dual-modality 18F-FDG PET/CT. *J Nucl Med*. 2004;45 Suppl 1:56S–65S.
9. Kong E, Chun K, Cho I, Lee S. 18F-FDG PET/CT with contrast enhancement for evaluation of axillary lymph node involvement in T1 breast cancer. *Nucl Med Mol Imaging*. 2010;44:170–6.