Additional Detection of Multiple Osteomas in a Patient with Gardner's Syndrome by Bone SPECT/CT

Woo Hyoung Kim · Dae-Weung Kim · Chang Guhn Kim · Myoung Hyoun Kim

Received: 13 March 2013 / Revised: 28 July 2013 / Accepted: 7 August 2013 / Published online: 27 August 2013
© Korean Society of Nuclear Medicine 2013

Familial adenomatous polyposis (FAP) is an autosomal dominant disorder which generally develops numerous polyps in the colon and rectum during the second decade of life [1]. Gardner's syndrome is a variant of FAP which has multiple osteomas, dental abnormalities, and fibromas, with incidence ranging between 1 in 4,000 and 1 in 40,000, depending on the region [2–5].

We present the case of a 35-year-old man referred to our department for bone scintigraphy who was shown to have multiple colon polyps and nuchal type fibroma. In this patient, planar image showed intensely increased uptakes of bone agent in the maxilla and mandible (Fig. 1a), which are typical findings of Gardner's syndrome [6, 7]. Single photon emission computed tomography/computed tomography (SPECT/CT) was acquired to accurately identify and locate abnormal uptakes detected on planar images. SPECT/CT showed numerous osteomas in the maxilla and mandible where intense uptakes of bone agent were seen (Fig. 1b–d). Mildly asymmetrical, focally increased uptake in the superomedial aspect of the left orbit on anterior planar image was shown to be a frontal sinus osteoma on SPECT/CT (Fig. 2a). Enhanced sensitivity of detecting lesions of SPECT/CT superior to planar

scintigraphy has been reported in previous studies [8, 9]. In this report, additional osteomas of sphenoidal and ethmoidal sinuses, which were not seen on planar scintigraphy, were

Fig. 1 A 35-year-old man presented with a history of growing neck mass in the right posterior neck. Surgical excision was performed, and subsequent biopsy revealed the mass as nuchal type fibroma. To rule out Gardner's syndrome, colonoscopy was performed and revealed multiple colonic polyps throughout entire colon. The patient was referred to our department for bone assessment and Tc-99m DPD bone scintigraphy revealed intense and symmetric uptakes of maxilla, mandible and mildly asymmetrically increased uptake in superomedial aspect of left orbit (arrow) (a). SPECT/CT image was acquired to accurately localize the lesions detected on planar images (b, c). Multiple osteomas and sclerotic bone changes with intense bone agent uptake in both maxilla and mandible were seen (d)

W. H. Kim · D.-W. Kim · C. G. Kim (✉) · M. H. Kim
Department of Nuclear Medicine,
Wonkwang University School of Medicine,
344-2 Shinyong-Dong, Iksan, Jeollabuk-do 570-711,
Republic of Korea
e-mail: leokim@wonkwang.ac.kr

D.-W. Kim · C. G. Kim
Institute of Wonkwang Medical Science,
Wonkwang University School of Medicine, Iksan,
Jeollabuk-do, Korea

Fig. 2 The focally asymmetrically increased uptake in the left orbit was found out to be an osteoma in left frontal sinus (**a**). Moreover, SPECT/CT images showed additional, multiple, focally increased uptakes of bone agent in sphenoidal (**b**) and ethmoidal (**c**) sinuses that were not shown in planar image, leading to additional diagnosis of multiple osteomas in paranasal sinuses. Osteomas of ethmoidal and sphenoidal sinuses were

not seen in planar images probably due to low contrast compared with physiological accumulation of bone agent in regional nasal bones. This case emphasizes that the nuclear physician should be aware of the typical findings of bone scintigraphy for Gardner's syndrome and also that SPECT/CT could be helpful to diagnose additional lesions not seen on planar images

detected by SPECT/CT (Fig. 2b, c). This case emphasizes that nuclear physicians should be aware of the typical findings of bone scintigraphy for Gardner's syndrome and also that SPECT/CT could be helpful to diagnose additional lesions not seen on planar images.

Acknowledgment This study was supported by Wonkwang University 2012.

Conflict of Interest The authors declare that they have no conflict of interest.

References

1. Half E, Bercovich D, Rozen P. Familial adenomatous polyposis. *Orphanet J Rare Dis*. 2009;4(1):22.
2. Basaran G, Erkan M. One of the rarest syndromes in dentistry: gardner syndrome. *Eur J Dent*. 2008;2(3):208–12.
3. Baykul T, Heybeli N, Oyar O, Dogru H. Multiple huge osteomas of the mandible causing disfigurement related with Gardner's syndrome: case report. *Auris Nasus Larynx*. 2003;30(4):447–51.
4. Cankaya AB, Erdem MA, Isler SC, Cifter M, Olgac V, Kasapoglu C, et al. Oral and maxillofacial considerations in Gardner's Syndrome. *Int J Med Sci*. 2012;9(2):137–41.
5. Madani M, Madani F. Gardner's syndrome presenting with dental complaints. *Arch Iran Med*. 2007;10(4):535–9.
6. Nguyen BD, Chin BB, Beall DP. Gardner's syndrome with bone scintigraphic and CT demonstration. *Clin Nucl Med*. 1998;23(4):234–5.
7. Takeuchi T, Takenoshita Y, Kubo K, Iida M. Natural course of jaw lesions in patients with familial adenomatosis coli (Gardner's syndrome). *Int J Oral Maxillofac Surg*. 1993;22(4):226–30.
8. Choi B, Kim DH, Son SH, Zeon S, Ahn BC. Usefulness of SPECT/CT for equivocal findings on ¹³¹I whole-body scan in a patient with differentiated papillary thyroid cancer. *Clin Nucl Med*. 2013.
9. Damle N, Kumar R, Kumar P, Jaganathan S, Patnecha M, Bal C, et al. SPECT/CT in the diagnosis of skull base osteomyelitis. *Nucl Med Mol Imaging*. 2011;45(3):212–6.