

# Unexpected Findings on Gallium-67 Scintigraphy

## Detection of Undifferentiated Endometrial Stromal Sarcoma

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**Abstract:** We reported an extremely rare case of undifferentiated endometrial stromal sarcoma imaged with gallium-67 scintigraphy. This previously healthy 32-year-old woman presented with cough and dyspnea for days. Unexpectedly, the pathology of the opacity in the right pulmonary hilar region demonstrated metastatic high-grade epithelioid sarcoma. Gallium scintigraphy performed to detect possible origin showed abnormal uptake in the right supraclavicular region, chest region and pelvic region. Computed tomography-guided biopsy of the pelvic mass revealed undifferentiated endometrial stromal sarcoma. This case demonstrated the usefulness of

gallium-67 scintigraphy in the detection of the primary disease and the evaluation of the metastatic disease.

**Key Words:** gallium-67 scintigraphy, sarcoma, uterine sarcoma, endometrial stromal sarcoma

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### REFERENCES

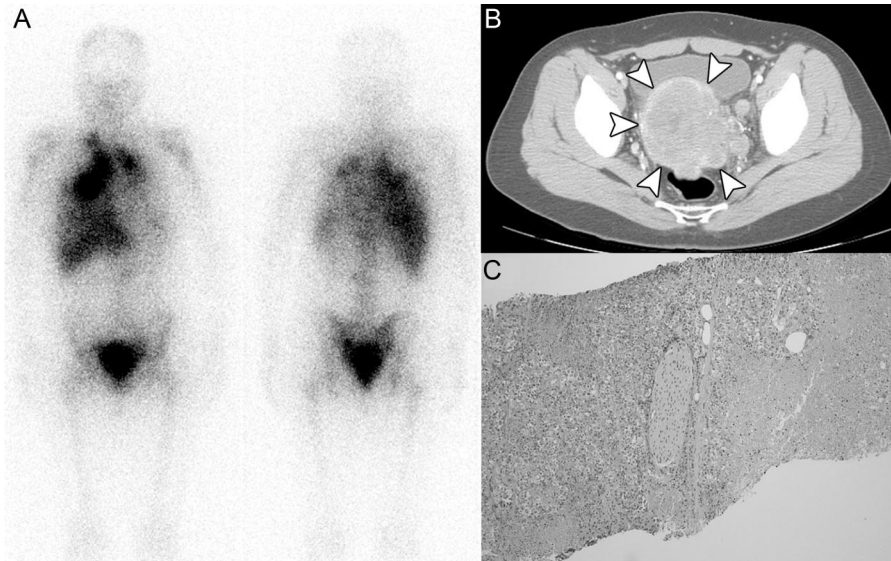
1. Jemal A, Tiwari RC, Murray T, et al. Cancer statistics, 2004. *CA Cancer J Clin.* 2004;54:8–29.
2. Wu YC, Hsieh TC, Kao CH, et al. Thallium-201 scintigraphy of myxofibrosarcoma. *Clin Nucl Med.* 2009;34:943–945.
3. Lin JF, Slomovitz BM. Uterine sarcoma 2008. *Curr Oncol Rep.* 2008;10:512–518.
4. Amant F, Coosemans A, Debiec-Rychter M, et al. Clinical management of uterine sarcomas. *Lancet Oncol.* 2009;10:1188–1198.
5. Wu YC, Chang CH, Hsieh TC, et al. Unusual case with multiorgan gallium-avid metastases of renal cell carcinoma. *Am J Med Sci.* 339:275.
6. Leonard JC, Raftery RG. Metastatic osteogenic sarcoma involving the left ventricle. Identification with gallium-67 citrate. *Clin Nucl Med.* 1985;10:440.
7. Cachin F, Kelly A, Maublant J. Evaluation of the therapeutic response: role of isotopic imaging [in French]. *Bull Cancer.* 2006;93:1191–1199.
8. Cher S, Lay Ergun E. Positron emission tomographic-computed tomographic imaging of a uterine sarcoma. *Clin Nucl Med.* 2003;28:443–444.

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**FIGURE 1.** This previously healthy 32-year-old woman presented with cough and dyspnea for days, with suspicion of small-cell lung cancer because of the opacity in the right hilar region and right-sided pleural effusion on the chest plain radiography and computed tomography (CT) and nonresponse to 5-day empirical antibiotic treatment. Unexpectedly, endobronchial ultrasound-guided fine-needle aspiration biopsy of the right hilar mass demonstrated metastatic high-grade epithelioid sarcoma.

Based on the histologic suspicion of metastatic high-grade epithelioid sarcoma, whole-body gallium-67 scintigraphy was performed to detect the possible origin. Planar images (A) at 48 hours and 72 hours after intravenous injection of 5 mCi gallium-67 citrate demonstrated persistently abnormal uptake in the right supraclavicular region, chest region, and pelvic region. Corresponding pelvic CT showed a uterine mass (arrowheads in B) with invasion to cervix and multiple lymph metastases in the peritoneum.

CT-guided biopsy of the uterine mass (C) demonstrated atypical epithelioid cells with pleomorphic vesicular nuclei, prominent nucleoli, and active mitotic activity, which are in solid pattern with multifocal patchy tumor necrosis and evidence of perineural invasion. The immunohistochemical study revealed tumor cells coexpressing vimentin and smooth muscle actin but no CK, CK8, CD10, nepsinA, LCA, TTF-1, or desmin. According to the histopathologic pictures, the immunohistochemical profiles and available clinical information, a diagnosis of undifferentiated endometrial stromal sarcoma was made.

Soft-tissue sarcomas are uncommon tumors, account for only about 1% of all cancers.<sup>1,2</sup> Uterine sarcomas are a group of rare and usually aggressive soft-tissue cancers.<sup>3</sup> Sarcomas of the uterus constitute only 3% of uterine malignancies.<sup>4</sup> The 3 major subtypes of uterine sarcomas are carcinosarcoma, leiomyosarcoma, and endometrial stromal sarcoma (listed in decreasing order of incidence).<sup>3</sup> Gallium-67 is taken up by various tumors, such as malignant lymphoma, malignant melanoma, hepatocellular carcinoma, lung cancer, and osteogenic sarcoma.<sup>5,6</sup> However, it is worthy noting that thorough literature search of the available databases to date fails to retrieve any case reports of undifferentiated endometrial stromal sarcoma with representative gallium-67 scintigraphic images. This case demonstrates the usefulness of gallium-67 scintigraphy in detection of the primary disease and evaluating the metastases. Furthermore, it is presumed that gallium-67 scintigraphy may be a useful tool in monitoring the treatment response of this disease.<sup>7,8</sup>