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CASE REPORT

[^{99m}Tc]Tc-MDP uptake in primary tumor of ovarian carcinoma following surgical removal of metastatic Sister Mary Joseph's node in umbilical herniorrhaphy

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ABSTRACT

We discussed a rare case of [^{99m}Tc]Tc-Methylene diphosphonate (MDP) uptake in the malignant ovarian tumor of a post-menopausal woman. She was referred for bone scintigraphy following the diagnosis of high-grade papillary serous adenocarcinoma of the ovary, which was identified after the detection of a Sister Mary Joseph's node during umbilical herniorrhaphy surgery. The whole body bone scan and post-void static images demonstrated a smeared area of persistent [^{99m}Tc]Tc-MDP uptake in the right pelvic region, adjacent to the bladder. Subsequent SPECT/CT imaging, prompted by lumbar pain, localized the uptake to the dystrophic calcification within the ovarian tumor. This case underscores the importance of paying attention to extra-osseous MDP uptake, such as within the ovary and uterine adnexa, as it can provide valuable diagnostic clues for further evaluation and increase the likelihood of identifying previously undetected pathologies.

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INTRODUCTION

Technetium-99m methylene diphosphonate ([^{99m}Tc]Tc-MDP) uptake have been uncommonly reported in various benign and malignant pathologies of the ovary . In this case, we introduce a 62-year-old woman who was diagnosed with metastatic high-grade papillary serous adenocarcinoma of the ovary, incidentally uncovered following umbilical herniorrhaphy surgery. The bone scintigraphy revealed MDP uptake in the ovarian tumor which was deemed to be due to dystrophic calcification in psammoma bodies within the tumor.

CASE PRESENTATION

A 62-year-old postmenopausal female was referred for metastasis workup following incidental diagnosis of metastatic high-grade papillary serous adenocarcinoma during surgery for an umbilical hernia six months prior. Immunohistochemistry assessments of the node within the hernia sac was positive for CK7 and PAX8 and negative for CK20, CDX2 and TTF, suggested the ovary as the origin. After a few sessions of chemotherapy, she presented with lumbar pain and was evaluated using whole-body bone scan. The scan revealed foci of uptake in the skull subsequently confirmed as contamination and the full bladder necessitated a complementary image from the pelvic region after voiding (Figure 1A). A suspicious smeared uptake was noticed on the pelvic post-void static image (Figure 1B, blue arrow). Given the patient's lumbar pain, a SPECT/CT study was performed from the pelvic region to localize the lesion more precisely. The SPECT/CT images confirmed the uptake to be localized within the zones of calcification in a solid cystic mass in the right ovary measuring 97*100 mm in size (Figure 1C).

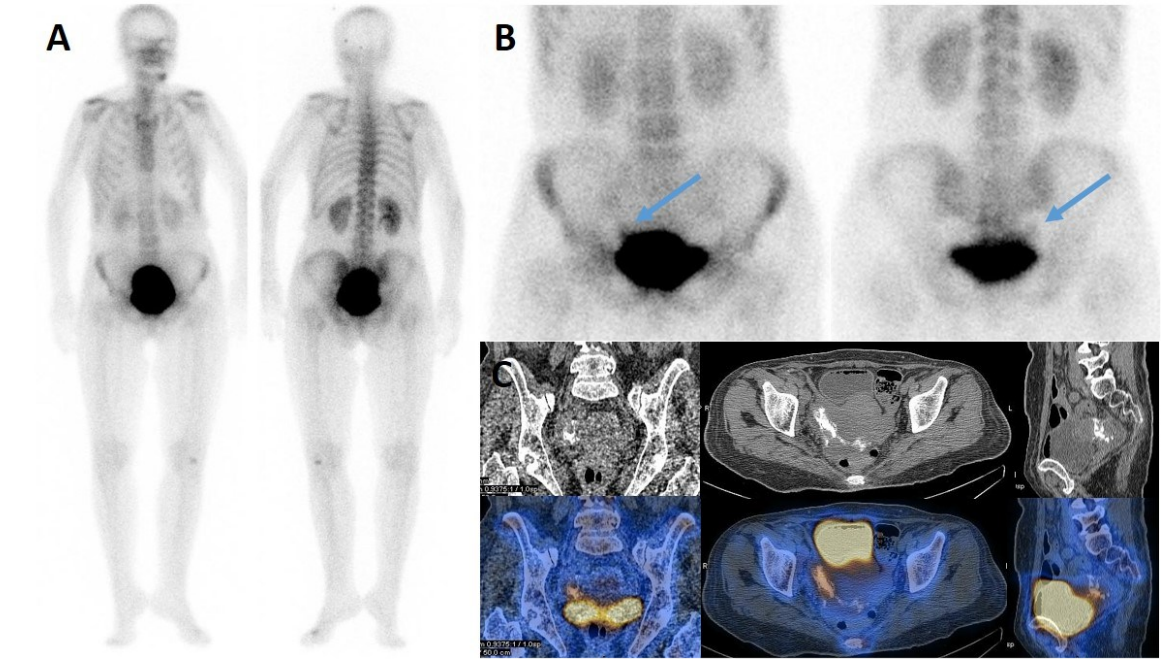

Figure 1. The whole body scan revealed foci of uptake in the skull, which were subsequently confirmed as contamination (A). The post-void pelvic static images demonstrated a suspicious, smeared uptake in the right side of the pelvis, supero-lateral to the bladder (B, blue arrow). SPECT/CT images localized the zone of uptake in the right side of the bladder to areas of calcification within a solid cystic mass in the right ovary

DISCUSSION

The diagnosis of metastatic carcinoma within a hernia sac is an uncommon occurrence [1]. However, among various hernia sites, the incidence of metastasis in hernia sac have been reported to be disproportionately higher in cases of umbilical hernia, especially from genitourinary tract origin in women. [2, 3] Moreover, ovarian tumor may attain a significant size, leading to local protrusion of the umbilicus and although extremely rare, manifesting as an umbilical hernia. [4] In the presented case, Sister Mary Joseph's node was identified as an incidental finding during the surgical repair of an umbilical hernia. By coincidence, during the evaluation for skeletal metastases, [^{99m}Tc]Tc-MDP scan revealed

an unexpected uptake of radiotracer within the primary soft tissue tumor. [^{99m}Tc]Tc-MDP accumulation have been reported in malignant ovarian tumors including papillary serous adenocarcinoma [5, 6], well-differentiated ovarian carcinoma [7] and krukenberg tumor [8] as well as benign tumors including thecoma [9], benign cystic teratoma [10] and brenner tumor [11]. Attributable mechanisms consist of dystrophic calcification in psammoma bodies, extensive necrosis or calcium deposition within the tumor stroma. [5–11] Considering the pathologic diagnosis of the tumor, the assumed mechanism for this case most likely regards the dystrophic calcification in psammoma bodies. In this instance, it is noteworthy that the initial presentation of her cancer was characterized by a rare and unexpected finding of the Sister Mary Joseph node in the umbilical herniorrhaphy surgery. In this context, a sensitive reading of a whole-body bone scan, which could be performed for an unrelated indication, such as evaluating her lumbar pain, might serve as the initial diagnostic tool in this patient, potentially enabling early detection and treatment, thereby averting potential progression to advanced stages of the disease.

CONCLUSION

Our experience highlights significance of attention to extra-osseous MDP uptake within dystrophic calcifications, especially in the ovary and uterine adnexa, as it may give a pivotal diagnostic clue, in cases where bone scans are performed for indications other than malignancy. Given that the most of radiotracer clearance occurs via the urinary pathway, this can obscure the detection of uptake in soft tissue lesions located in vicinity of the bladder, as noted in our experience. Therefore, careful attention to tracer uptake within the pelvic area is essential when interpreting scans of patients presenting with lumbar or pelvic pain, as it may indicate underlying pathology.

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