

Case Report: MRI Whole Body Bone Scan

Christine S. Lo¹; Dr. Bill Wong; Dr. George T. J. Au; Gladys Goh Lo, M.D.²

¹Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong

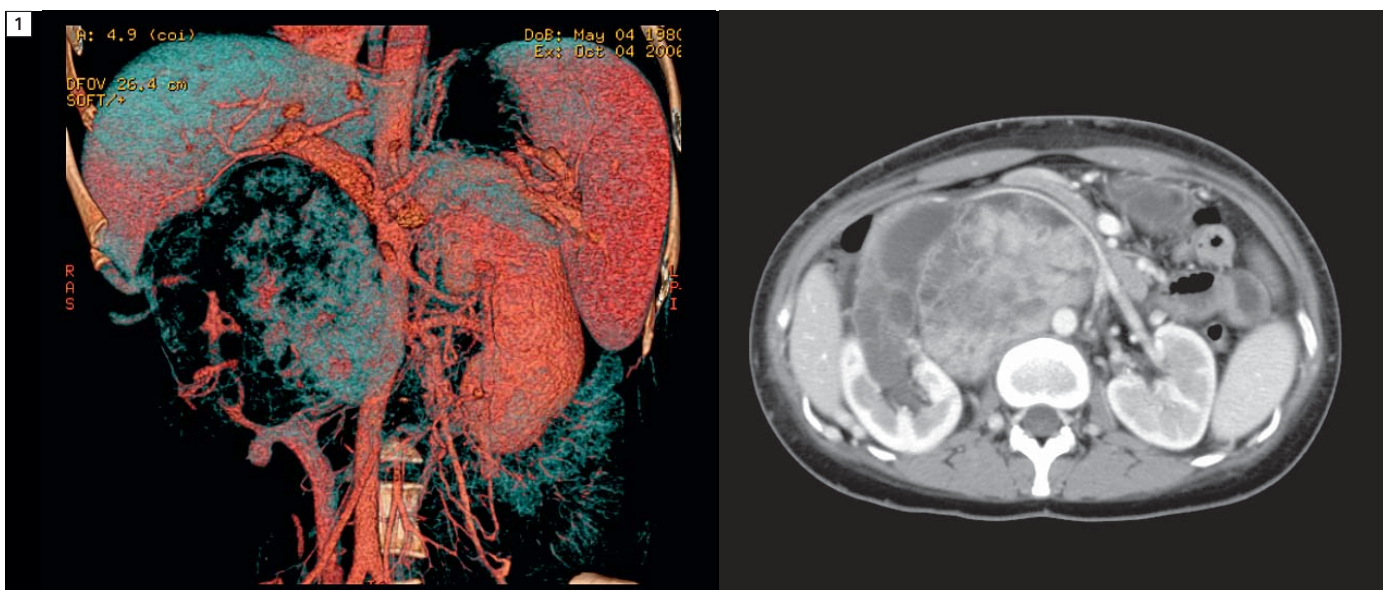
²Department of Diagnostic & Interventional Radiology, Hong Kong Sanatorium & Hospital, Hong Kong

This 27-year-old-female was first told she had a small retroperitoneal tumor on routine pregnancy ultrasound. She was further advised to treat the tumor after her pregnancy. Thereafter, she presented to the urologist with a huge retroperitoneal mass measuring 11 x 9.5 x 10.5 cm (transverse x AP x cephalocaudal dimension) (Fig. 1). This mass displaced the right kidney downwards and also invaded it. The inferior vena cava (IVC) could not be seen and the left renal vein was intact and stretched over the mass. Enbloc resection of the tumor, right kidney and partial IVC resection performed. Pathology showed leiomyosarcoma of the IVC. Her oncologist ordered a whole body MRI bone scan a year later. This scan showed widespread metastases to the cervical spine, thoracic spine, lumbar spine and sacrum without extradural mass (Fig. 2). There was extensive metastasis to both breasts, the

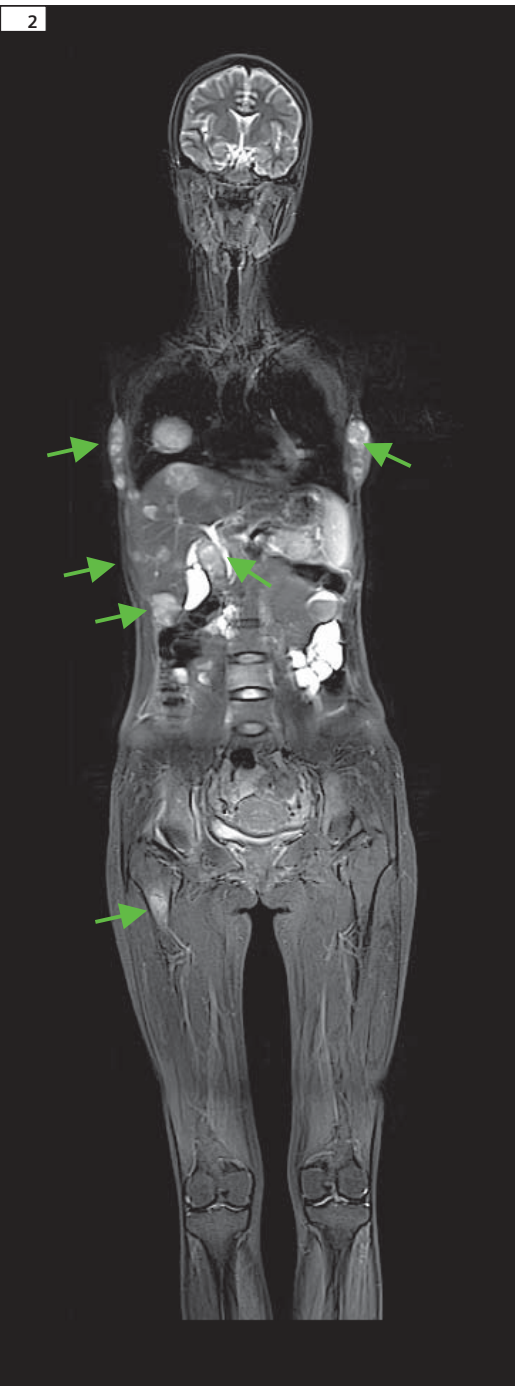
lungs, the liver and subcutaneous tissues. A recurrent tumor was also seen in the operative bed (Figs. 2, 3).

The MRI whole body bone scan protocol we use at our institution takes approximately 30 minutes. It is a non-contrast examination and consists of the following: coronal whole body STIR, sagittal T1 whole spine, sagittal STIR whole spine, axial STIR through the thorax, axial STIR through the pelvis (see table 1). This is a modification of the protocol proposed by Eustace S. et al. [1], the addition of sagittal T1 spine increases the specificity of spinal metastases. Metastatic lesions are low signal on T1-weighted images and high signal on STIR images whereas haemangiomas are high signal on both T1 and STIR images. The addition of axial STIR through the thorax and pelvis increases the sensitivity of detecting small rib and pelvic metastases. The MRI whole body scan is attractive because it

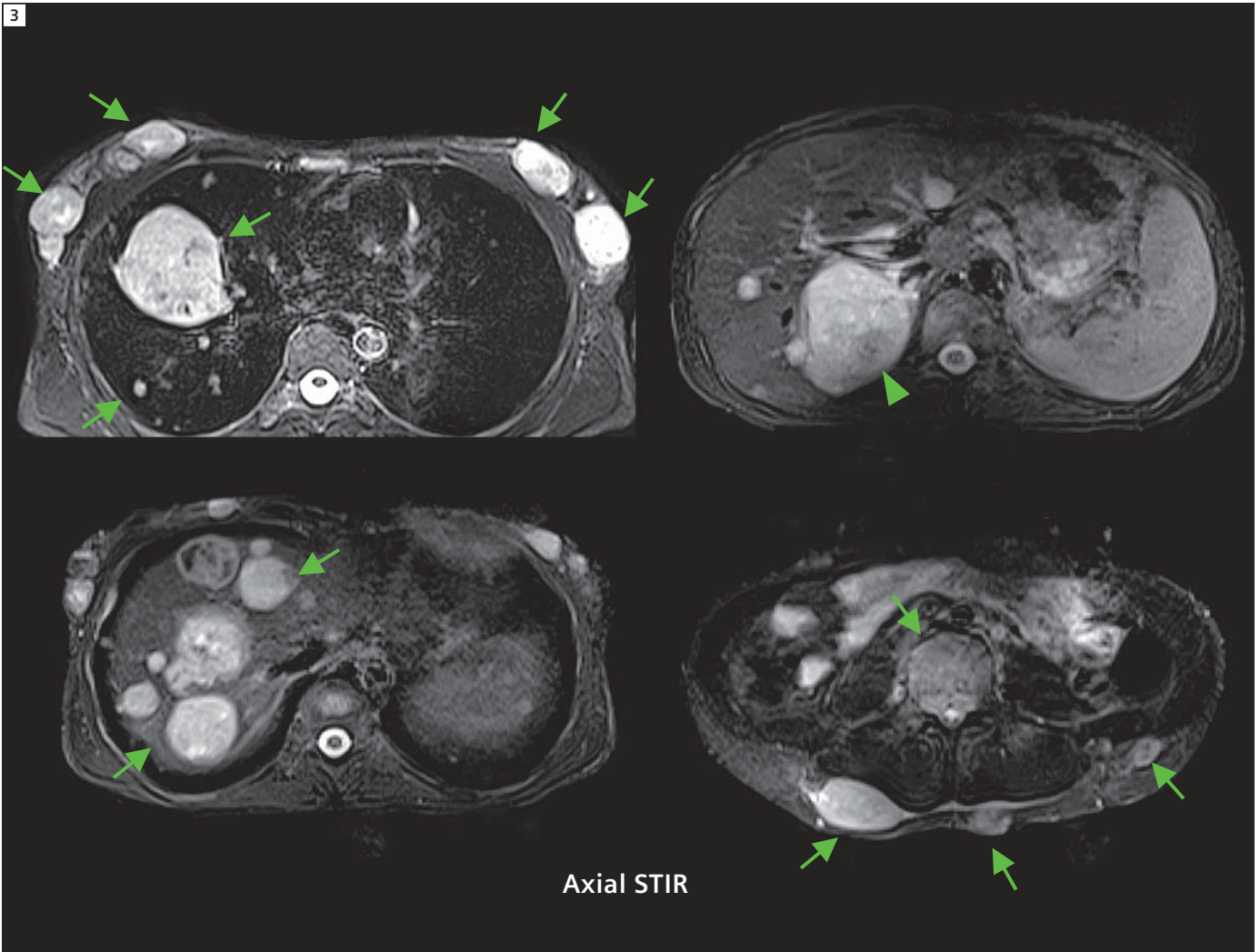
is non-invasive. There is no ionizing radiation and there is no contrast injection. Sensitivity is 96.5%, specificity is 100% and 52% of patients had additional soft tissue abnormalities [1]. This is clearly exemplified by our case. In other cases, spinal cord compressions from extradural masses are easily and accurately shown. Significant oedema in muscles and soft tissues often surround bony metastases explaining the painful symptoms that the patients' experience. Occasionally unsuspected brain metastases are detected because of surrounding oedema seen in the brain on coronal STIR images. MR whole body scan is playing an increasing role in our institution and this scan can be teamed up with MR whole body scan with contrast as well as MR whole body diffusion to increase the sensitivity and specificity of detecting M stage disease in oncologic patients.



1 Large right retroperitoneal mass.



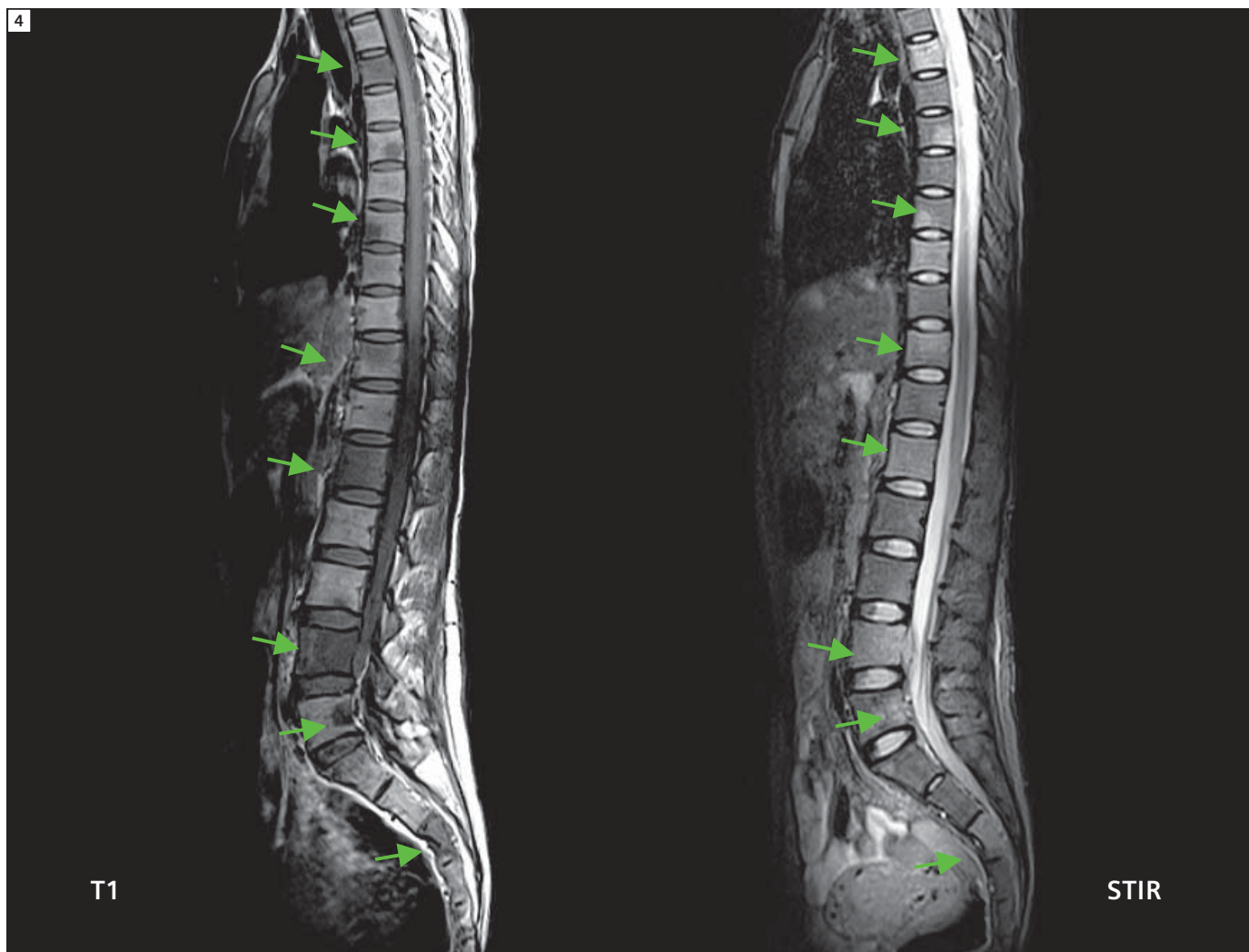
2 Metastases to both breasts, the lung, the liver and subcutaneous tissues (arrows). Recurrent tumor in operative bed (arrow head).



3 Metastases to the lung, the liver and subcutaneous tissues (arrows). Recurrent tumor in operative bed (arrow head).

Table 1: Our MRI bone scan protocol is as follows: (Total examination time is 30 minutes).

Sequence	Resolution (FOV, matrix, slice thickness)	Time
Coronal STIR (4 stations)	500 mm/ 314 x 448/ 10 mm	5'41"
Sagittal STIR whole spine (2 stations)	480 mm/ 311 x 448/ 5 mm	6'04"
Sagittal T1 whole spine (2 stations)	480 mm/ 358 x 512/ 5 mm	3'22"
Axial STIR (Thorax & pelvis, 2 stations)	380 mm/ 173 x 320/ 8 mm	2'30"



4 Metastases to cervical, thoracic, lumbar spine and sacrum.

References

- 1 Eustace S, Tello R, Decarvalho V, et al. A comparison of whole-body turbo short tau inversion recovery MR imaging and plan technetium 99m methylene diphosphonate scintigraphy in the evaluation of patients with suspected skeletal metastases. *AJR* 1997; 169:1655–61.

Contact

Gladys Lo, M.D.
 Hong Kong Sanatorium & Hospital
 2-4 Valley Road, Happy Valley
 Hong Kong
drgl@hksh.com