

CLINICAL CORNER #17

Ewing Sarcoma of the Hip

 IN THIS ISSUE

A 20-year-old male patient performed an MRI to investigate a newly detected mass on recent ultrasound examination.

 IMAGING FINDINGS & CLINICAL EVALUATION

Images acquired on a Vantage Elan 1.5T revealed a large and heterogeneous mass in the left gluteal region. T2*, DWI and DCE findings suggested an aggressive lesion, and a prompt cytological and histological characterization for surgical planning was recommended to the patient.

 **Clinical Note:** Swipe through the slides to explore the imaging findings, the role of advanced imaging techniques, and the full case details.

Thank you very much to **Claudio Frassi** from Studio Radiologico Bernasconi (Seregno, Italy) for scanning and to **Marta Cazzoli** for sharing the case 🙏

Special thanks to **Sara Pangaro** for creating the content and to all Editorial Board members for their continued support! ✨

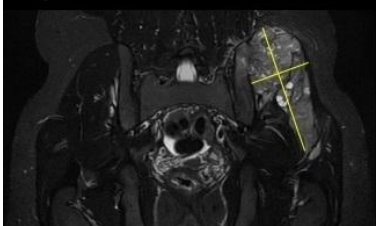


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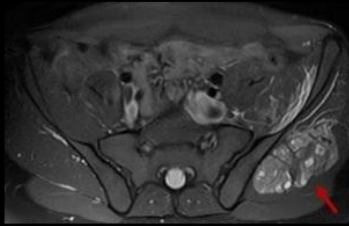
MRI scans of a 20-year-old male for a newly detected mass on recent ultrasound examination.



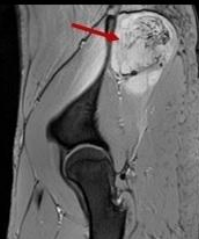
**Studio Radiologico
Bernasconi**
(Seregno, Italy)



COR FSE STIR
 $0.5 \times 0.5 \times 4 \text{ mm}^3$
3 min 26 s



AX PD FS
 $0.4 \times 0.4 \times 4 \text{ mm}^3$
2 min 37 s



SAG T2*
 $0.5 \times 0.5 \times 4 \text{ mm}^3$
3 min 4 s

- Large heterogeneous mass in the left gluteal region (→):
- Located deep to the gluteus maximus within the gluteus medius, including involvement of the gluteus minimus
- Measures $15 \times 5 \text{ cm}^2$ (→).
- Although not standard in most protocols, T2* can highlight haemorrhagic and necrotic components within Ewing sarcoma further demonstrating its aggressiveness.

CC17_NDP: Acquired on a [Vantage Flan 1.5T V6](#) with [Advanced Intelligent Clear-IQ Engine \(AiCE\)](#) using [Atlas SPEEDER Body and Spine coils](#)

Canon

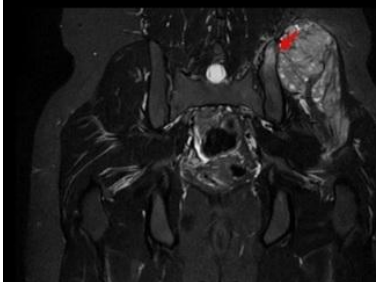


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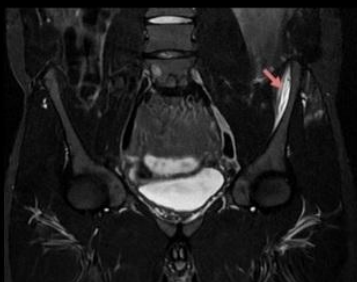
- Hyperintense signal (→) in the left iliac wing including erosive changes and periosteal irregularity (→). Findings overall suggestive of neoplastic process.
- Small fluid collection deep to the iliac wing (→).



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3 min 26 s



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2 min 37 s

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Canon

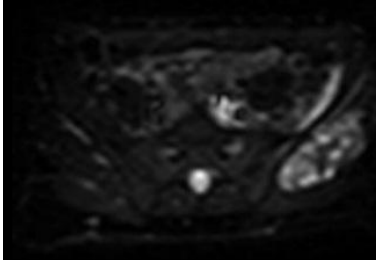


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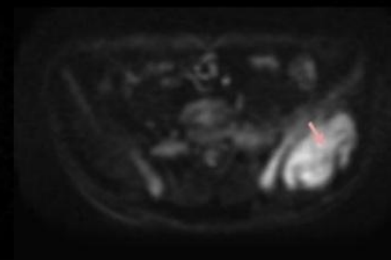
- Diffusion-weighted imaging (DWI) shows a hyperintense signal within the lesion on b800 (→) and corresponding hypointensity on the ADC map (→), consistent with restricted diffusion ($0.75 \times 10^{-3} \text{ mm}^2/\text{s}$).



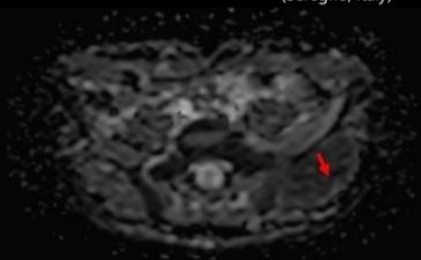
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b0



b800



ADC map

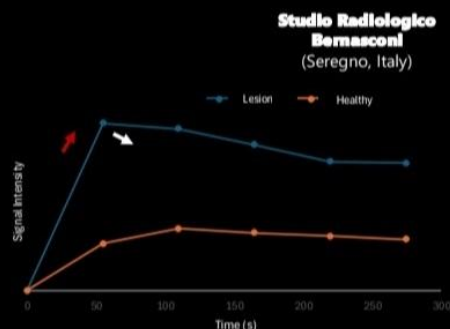
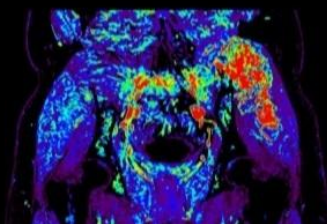
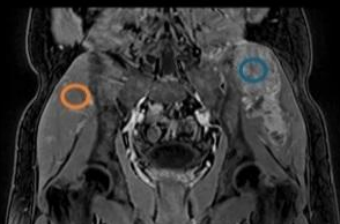
AX DWI
 $1.6 \times 1.6 \times 4 \text{ mm}^3$
4 min 20 s

CC17_NDP: Acquired on a [Vantage Flan 1.5T V6](#) with [Advanced Intelligent Clear-IQ Engine \(AiCE\)](#) using [Atlas SPEEDER Body and Spine coils](#)



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- After contrast administration, the lesion (●) shows a rapid and marked wash-in (→) and wash-out (→) compared to normal tissue (●).



DCE, Wash-in map and Time-signal intensity curve (processed with Olea Medical solutions)
1.25 x 2 x 4 mm³
5 min 30 s (6 phases)

- The imaging findings suggested an aggressive lesion, and a prompt cytological and histological characterization for surgical planning was recommended to the patient.

CC17_NDP: Acquired on a Vantage Elan 1.5T V6 with Advanced Intelligent Clear-IQ Engine (AICE) using Atlas SPEEDER Body and Spine coils



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ADDITIONAL INFORMATION

Disease mechanism



Ewing sarcoma is a highly aggressive malignant bone and soft-tissue tumor driven in most cases by a chromosomal translocation (typically EWSR1-FLI1 fusion) that promotes uncontrolled proliferation, impaired differentiation, and tumorigenesis. The tumor commonly arises in the pelvis and hip region, with a propensity for early metastasis, particularly to the lungs and other bones.¹

Clinical signs



Patients with hip Ewing sarcoma often report localized pain (initially intermittent, later persistent), swelling, tenderness, and reduced range of motion, sometimes accompanied by a palpable mass. Systemic symptoms such as fever, fatigue, and weight loss may occur, reflecting the tumor's aggressive biology. Due to the deep pelvic location, diagnosis may be delayed until symptoms become significant.¹

Epidemiology



Ewing sarcoma primarily affects children and teenagers, with a peak incidence at the age of 15 years. The disease is more prevalent in European males while it is rare in African and East Asian populations.¹



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ADDITIONAL INFORMATION



What are the classification criteria for Small Round Cell Sarcoma?

The WHO Classification of Soft Tissue and Bone Tumours currently recognizes four categories of undifferentiated small round cell sarcoma:

- Ewing sarcoma (EWSR1-FLI1 gene fusion)
- EWSR1-non-ETS fusion sarcomas (e.g., NFATc2, PATZ1)
- CIC-rearranged sarcoma (CIC-DUX4 or related gene fusions)
- BCOR-altered sarcoma (BCOR gene fusions or internal tandem duplications, most commonly BCOR-CCNB3.)

These tumors are hard to distinguish because they look similar under the microscope and share overlapping markers. Therefore, molecular/genetic testing is often required to distinguish them accurately.²



What is the origin of the name "Ewing sarcoma"?

The name "Ewing Sarcoma" comes from the physician, James Ewing, an American pathologist who first described it in 1921. He identified this cancer as a distinct type of bone tumor, different from osteosarcoma. He called it a "diffuse endothelioma of bone" based on the understanding at the time, but it was later renamed in his honor as Ewing sarcoma. Although he is best remembered for this singular achievement, Ewing's contributions to the study of cancer were far more profound and influential. His broader legacy includes co-founding the American Association for Cancer Research (1907) and championing radiation therapy as a primary cancer treatment at a time when surgery was the only accepted option.³

REFERENCES

- [1] Grünewald, T. G. P., Cidre-Aranaz, F., Surdez, D., Tomazou, E. M., de Álava, E., Kovar, H., Sorensen, P. H., Delattre, O., & Dirksen, U. (2018). Ewing sarcoma. Nature Reviews Disease Primers, 4, 5. <https://doi.org/10.1038/s41572-018-0003-x>
- [2] Dehner, Carina A., Alexander J. Lazar, and John SA Chrisinger. "Updates on WHO classification for small round cell tumors: Ewing sarcoma vs. everything else." Human Pathology 147 (2024): 101-113. <https://doi.org/10.1016/j.humpath.2024.01.007>
- [3] Cripe, T. P. (2011). Ewing sarcoma: an eponym window to history. Sarcoma, 2011(1), 457532. <https://doi.org/10.1155/2011/457532>