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IMAGE OF THE MONTH

[^{68}Ga]Ga-FAPI and [^{18}F]FDG PET/CT images in a patient with juvenile polymyositis

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A 15-year-old girl presented with recurrent fever, progressive muscle weakness, and myalgias in bilateral upper and lower extremities for 1 month. Laboratory examination showed elevated CK (3683 U/L; reference range, 40–200 U/L) and CK-MB (120 U/L; reference range, < 25 U/L). Electromyography showed diffuse myopathic disorders. STIR T2-weighted MRI images (a–c) detected high signal intensity like a pattern of edema in multiple muscles, suggesting inflammatory myopathy.

The patient then underwent [^{18}F]FDG PET/CT and was recruited in a clinical trial of [^{68}Ga]Ga-FAPI PET/CT (NCT04499365) for the underlying malignancy which might be associated with inflammatory myopathy. [^{18}F]FDG PET/CT (d–g) revealed increased patchy FDG uptake in multiple muscles throughout the body that was most prominent in the proximal extremities, abdomen, and hips. Consistently, [^{68}Ga]Ga-FAPI PET/CT (h–k) demonstrated that the involved muscles shown in [^{18}F]FDG PET/CT were also FAPI-avid. No other lesions were detected in [^{18}F]FDG or [^{68}Ga]Ga-FAPI PET/CT. Finally, a muscle biopsy from the right deltoid was consistent with polymyositis without evidence of malignant cells and metabolic disease. Electron microscopy also showed the myofibrils arranged neatly, and local myofibrils torn and dissolved. Given the patient's age and the exclusion of having skin rash, family history of neuromuscular disease, and ormyotoxic drug exposure, she was diagnosed with juvenile polymyositis. After treating with prednisone and methotrexate for 6 weeks, her symptoms significantly improved, and the CK and CK-MB decreased to a normal level.

[^{68}Ga]Ga-FAPI has been developed as a tumor-targeting agent as fibroblast activation protein is overexpressed in cancer-associated fibroblasts [1]. In addition to solid tumors, increased [^{68}Ga]Ga-FAPI uptake has been reported in immunoglobulin G4–related disease, myocardial infarction, and arthritis [2–4]. The current case demonstrated juvenile polymyositis, a systemic autoimmune disorder characterized by chronic skeletal muscle inflammation in children and adolescents [5], also had active uptake of [^{68}Ga]Ga-FAPI.

This article is part of the Topical Collection on Hematology

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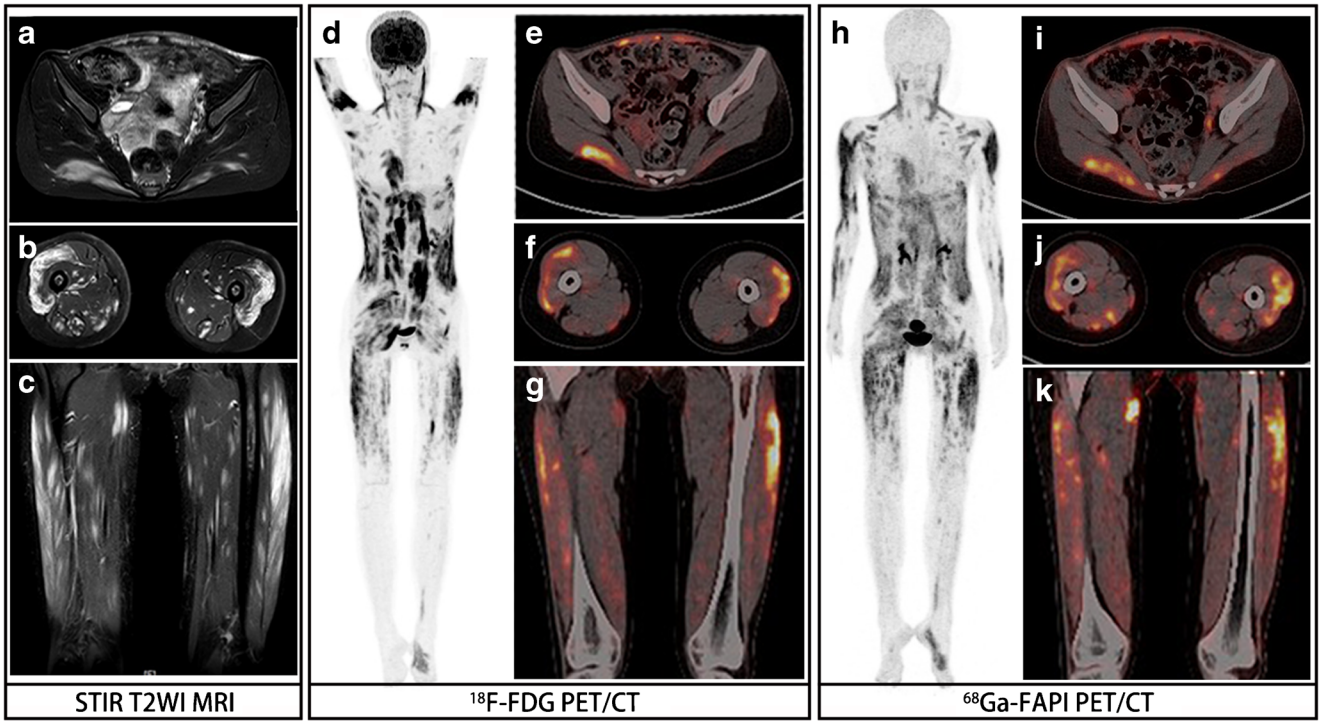

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Compliance with ethical standards

The study was approved by the institutional review board of our hospital and written informed consent for publication of this report was obtained from the patient. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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

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