Egyptian Rheumatology and Rehabilitation

CASE REPORT Open Access

Concurrent PET/CT detection of giant cell arteritis and high-grade colonic adenoma: a dual diagnostic benefit

Mert Can Ataca[1*] and Semih Gulle[2]

Abstract

Background Giant cell arteritis (GCA) is the most common large-vessel vasculitis in adults over 50 years of age and may rarely present with ischemic stroke. Its coexistence with premalignant or neoplastic lesions is increasingly recognized, with several studies reporting a temporal association between GCA and both solid and hematologic malignancies. We present a case highlighting the dual diagnostic role of 18 F-FDG PET/CT in detecting both GCA and an incidental colonic adenoma.

Case presentation A 70-year-old man was admitted with acute ischemic stroke presenting with amnesia and paraplegia. Brain MRI showed multiple bilateral small ischemic infarcts. Laboratory tests demonstrated elevated C-reactive protein and mild anemia. Thoracoabdominal CT indicated diffuse aortic wall thickening, and temporal artery ultrasound showed bilateral intima-media thickening. Whole-body PET/CT detected FDG uptake along the aorta and major branches, consistent with large-vessel vasculitis, and focal FDG uptake in the sigmoid colon wall without a corresponding CT lesion. Temporal artery biopsy confirmed GCA. The patient received high-dose corticosteroids followed by methotrexate and azathioprine. Colonoscopy, performed due to PET/CT findings, revealed a 3.5 cm villous adenoma with multifocal high-grade dysplasia, which was surgically resected. During five years of follow-up, no GCA relapse or malignant progression occurred.

Conclusion PET/CT provided a dual diagnostic benefit by confirming large-vessel GCA and identifying an unsuspected premalignant colonic lesion. This case illustrates the value of comprehensive imaging in elderly patients with systemic inflammation and stroke, while emphasizing the need for cautious interpretation and individualized management.

Keywords Giant cell arteritis, PET/CT, Large-vessel vasculitis, Ischemic stroke, Colonic adenoma, High-grade dysplasia

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Background

Giant cell arteritis (GCA) is the most common primary large-vessel vasculitis in adults over 50 years of age, characterized by granulomatous inflammation of the aorta and its branches. While cranial manifestations are well described, extracranial large-vessel involvement is increasingly recognized and may lead to severe complications, including ischemic stroke. The diagnostic process is further complicated when GCA presents with ischemic stroke, a rare but serious manifestation, often prompting extensive imaging for both vascular and systemic evaluation [1].

The association between GCA and malignancy has been the subject of growing interest. Recent population-based and multicenter studies suggest that premalignant and malignant conditions may be detected more frequently around the time of GCA diagnosis, although a direct causal relationship remains unproven [2–4]. These observations raise the possibility that shared immunological or inflammatory mechanisms, or heightened diagnostic scrutiny, may contribute to this coexistence.

18 F-FDG positron emission tomography/computed tomography (PET/CT) has emerged as a valuable imaging modality in suspected large-vessel vasculitis, enabling visualization of inflammatory activity along the vessel wall and facilitating assessment of disease extent. Importantly, whole-body PET/CT may also reveal clinically occult neoplastic or premalignant lesions during systemic evaluation. We report a case in which PET/CT simultaneously detected large-vessel vasculitis and an incidental colonic villous adenoma with high-grade dysplasia.

Case presentation

A 70-year-old man was admitted to the emergency department with an acute onset of amnesia and paraplegia. He had no prior diagnosis of systemic inflammatory, rheumatologic, or malignant disease. The patient denied recent infection, constitutional complaints, or B symptoms, including fever, night sweats, or weight loss. There was no history of headache, scalp tenderness, jaw claudication, visual disturbance, or polymyalgia rheumatica–related symptoms.

On physical examination, blood pressure and vital signs were stable. Neurological examination was consistent with an acute cerebrovascular event, correlating with the presenting symptoms of paraplegia and cognitive impairment. Peripheral pulses were palpable and symmetric, and no bruits were detected over the temporal or carotid arteries. No temporal artery tenderness, nodularity, or skin changes were noted. Cardiovascular, respiratory, and abdominal examinations were unremarkable, and no clinical signs of arthritis were observed.

Initial laboratory investigations revealed marked systemic inflammation, with a C-reactive protein level of 134.4 mg/L and an erythrocyte sedimentation rate of 120 mm/h. Complete blood count demonstrated leukocytosis (WBC count $10.8 \times 10^3/\mu L$) with neutrophil predominance, thrombocytosis (platelet count $551 \times 10^3/\mu L$), and microcytic anemia (hemoglobin 10.7 g/dL; mean corpuscular volume 76.2 fL). Renal and liver function tests were within normal limits. Serum electrolytes, thyroid function tests, vitamin B12, and folate levels were unremarkable.

Brain MRI demonstrated multiple bilateral scattered small ischemic infarcts involving the deep white matter. MR angiography revealed bilateral cavernous internal carotid artery stenoses (left 90–95%, right 70–80%). Thoracoabdominal CT demonstrated diffuse circumferential thickening of the aortic wall. Given the combination of acute ischemic stroke, unexplained systemic inflammation, and large-vessel wall thickening, further evaluation for large-vessel vasculitis was clinically suspected. Temporal artery ultrasound demonstrated bilateral concentric hypoechoic wall thickening consistent with a halo sign, with a maximal intima-media thickness of approximately 0.7 mm.

Whole-body 18 F-FDG PET/CT was performed to assess the extent of vascular involvement and to exclude occult malignancy. PET/CT demonstrated diffuse increased FDG uptake involving the entire aortic wall from the ascending to the abdominal aorta, with more pronounced focal uptake in the thoracic aorta. Increased FDG uptake was also observed in multiple large arterial branches, including the brachiocephalic, bilateral subclavian, bilateral common carotid, bilateral common and external iliac, femoral, and popliteal arteries (SUVmax: 4.3), consistent with active large-vessel vasculitis. Additionally, focal increased FDG uptake was observed in the sigmoid colon wall (SUVmax: 3.5) (Fig. 1), without a corresponding structural abnormality on CT images.

Cerebral digital subtraction angiography demonstrated segmental narrowing and irregularity of the cavernous segments of both internal carotid arteries, compatible with inflammatory vasculopathy (Fig. 2). Temporal artery biopsy confirmed the diagnosis of GCA.

Following initial stabilization of the ischemic event, high-dose methylprednisolone was initiated, later tapered with the addition of methotrexate and azathioprine as steroid-sparing agents. The colonic lesion was considered an incidental finding, as colonoscopy was prompted solely by PET/CT findings. Colonoscopy revealed a 3.5 cm sessile rectosigmoid polyp, and histopathology showed a tubulovillous adenoma with multifocal high-grade dysplasia. Because of the size of the lesion and the presence of multifocal high-grade dysplasia, definitive surgical treatment was recommended. Before surgery, immunosuppressive therapy was adjusted to minimize perioperative risk. Methotrexate and azathioprine were

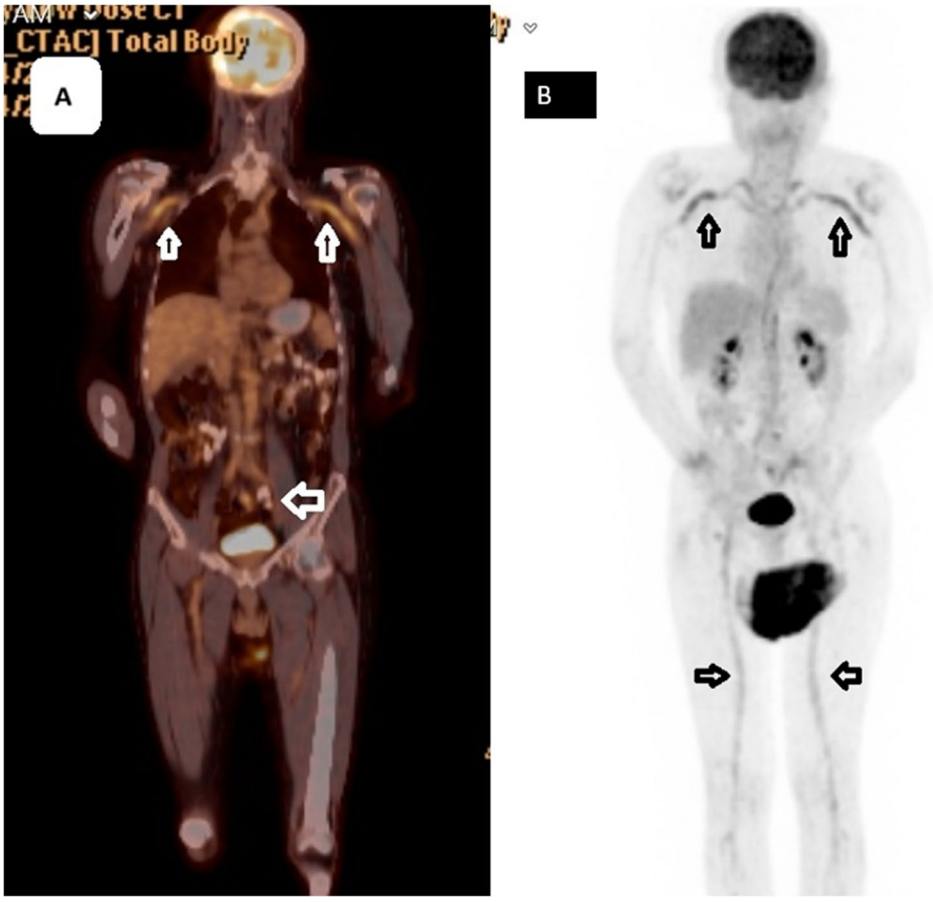


Fig. 1 (**A**) PET/CT images showing increased FDG uptake in the subclavian artery (upper arrow), consistent with large-vessel involvement of GCA, and focal FDG uptake in the sigmoid region (lower arrow) (**B**) PET/CT demonstrating diffuse arterial FDG uptake involving the aortic branches, compatible with GCA-related large-vessel inflammation

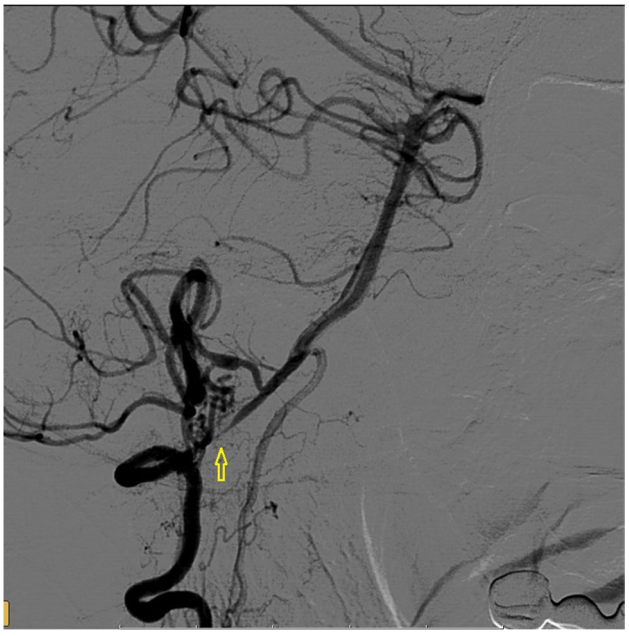


Fig. 2 Cerebral angiography showing cranial involvement of GCA

discontinued 10 days prior to the operation, while low-dose corticosteroid therapy with methylprednisolone (6 mg/day) was continued. The patient subsequently underwent a rectosigmoidectomy. The resected specimen measured 23 cm in length, with a 3.5 cm polypoid tubulovillous adenoma located on the posterior wall of the upper rectum. Surgical margins were clear (distal margin 3 cm; proximal margin 16 cm; radial and mesenteric margins were free of dysplasia or malignancy), and no macroscopic perforation was identified. Thirteen lymph nodes were retrieved, all reactive with no evidence of malignancy. Final pathology confirmed a tubulovillous adenoma with high-grade dysplasia, without invasive carcinoma. The patient was followed by General Surgery, Gastroenterology, and Rheumatology. During five years of follow-up, the patient remained clinically stable with no GCA relapse or malignant progression.

Discussion

This case illustrates the potential dual diagnostic utility of 18 F-FDG PET/CT in an elderly patient presenting with ischemic stroke and systemic inflammation. In

a single imaging session, PET/CT not only supported the diagnosis of large-vessel and cranial GCA but also revealed an unsuspected premalignant colonic lesion, guiding a sequential treatment approach, with urgent immunosuppression for vasculitis followed by oncologic management.

Although FDG uptake intensity alone is not disease-specific, the linear and segmental distribution of uptake involving multiple large vessels and exceeding background hepatic activity is characteristic of active large-vessel vasculitis rather than atherosclerosis. In this context, the observed SUVmax of 4.3 is consistent with values reported in active GCA, emphasizing the importance of pattern recognition over absolute SUV thresholds [5, 6].

Intracranial arterial involvement in GCA remains uncommon and diagnostically challenging. While vasospasm secondary to ischemia cannot be fully excluded, the bilateral and symmetric arterial involvement observed in this case, together with widespread extracranial vasculitic changes, favored an inflammatory mechanism rather than embolic occlusion alone [7, 8].

The relationship between GCA and malignancy remains controversial. Some cohort studies have demonstrated no overall increase in cancer risk [9], whereas others have reported modest excesses in solid and hematologic malignancies around the time of GCA diagnosis [2–4, 10]. These discrepancies are likely influenced by age-related confounding, surveillance bias, and differences in study design rather than a direct causal association. Nevertheless, heightened clinical vigilance for occult malignancy may be warranted in selected patients. Chronic immune activation, oxidative stress, and endothelial injury in GCA may nonetheless contribute to para-neoplastic immune phenomena [11]. Conversely, occult neoplasia could act as a persistent antigenic stimulus triggering vasculitic pathways in predisposed individuals [12].

Current EULAR imaging recommendations emphasize PET/CT as a first-line modality in suspected large-vessel vasculitis, noting its ability to detect both vasculitic activity and coexisting pathology [6]. Our case supports this guidance by demonstrating the potential added value of PET/CT in uncovering premalignant lesions during systemic evaluation. Furthermore, given the growing recognition of cancer screening in patients with polymyalgia rheumatica and GCA [13], PET/CT may potentially serve a dual purpose in initial assessment detecting vascular inflammation and opportunistically identifying early neoplastic change. While PET/CT is well established for diagnostic purposes, its routine use for disease monitoring remains limited to selected cases, and follow-up imaging should be guided by clinical and laboratory response. In the present case, follow-up PET/CT was not performed, as sustained clinical remission and normalization of inflammatory markers were achieved.

Limitations

This report is limited by its single-case design, which precludes generalization. Although PET/CT demonstrated dual diagnostic utility in this patient, further studies are needed to confirm its broader applicability. The potential costs and accessibility of PET/CT should also be considered in routine practice.

In conclusion, this case illustrates the clinical advantage of integrating whole-body PET/CT into the diagnostic work-up of elderly patients presenting with ischemic stroke and inflammatory markers. The simultaneous identification of GCA and a high-grade colonic adenoma allowed accurate diagnosis and multidisciplinary, sequential management. Vigilant oncologic assessment and individualized immunosuppression remain essential to optimizing long-term outcomes.

Abbreviations

EULAR	European Alliance of Associations for Rheumatology
GCA	Giant cell arteritis
MRI	Magnetic resonance imaging
PET/CT	18 F-FDG positron emission tomography/computed tomography

Acknowledgements

not applicable.

Authors' contributions

Concept – M.C.A., S.G.; Design – M.C.A., S.G.; Supervision – S.G.; Resources – M.C.A., S.G.; Materials – M.C.A., S.G.; Data Collection and/or Processing – M.C.A., S.G.; Literature Search – M.C.A., S.G.; Writing Manuscript – M.C.A., S.G.; Critical Review – S.G.; All authors reviewed the manuscript.

Funding

The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

Data availability

The data are available from the corresponding author upon reasonable request.

Declarations

Ethics approval

Not applicable.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Consent to participate

Written informed consent for participation was obtained from the patient.

Competing interests

The authors declare no competing interests.

Received: 18 November 2025 / Revised: 4 January 2026 / Accepted: 9 January 2026

Published online: 29 January 2026

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