RHEUMATOLOGY

Letter to the Editor (Case report)

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Takayasu arteritis: active or not, that's the question

Rheumatology key message

- With the current diagnostic tools it is difficult to assess disease activity in Takayasu arteritis.

SIR, a 30-year-old woman with left sided brachiofascial hemiparesis, pre-existing fatigue and progressive and fluctuating blurred vision presented at our emergency room. The ESR was 53 mm/h (norm <28 mm/h), the remaining parameters, inclusive of CRP with 8 mg/l (norm <10 mg/l), within the normal range and cardiovascular risk factors were absent. MRI showed a small subacute infarction in the middle cerebral artery territory on the right side and small calibres of all supraaortal arteries, but normal intracerebral arteries. Duplex sonography confirmed a filiform stenosis of the brachiocephalic trunc, common carotid artery and subclavian artery on both sides with retrograde flow further distal in the subclavian arteries and a hyperechoic circumferential wall thickening of these arteries. The vertebral arteries were unremarkable with orthograde flow.

The signs of systemic inflammation, the vessel wall thickening and filiform stenosis (in a young female patient) were consistent with Takayasu arteritis (TA). PET with CT with [^{18}F]fluorodeoxyglucose (FDG) revealed hypermetabolism of the left axillary artery, brachiocephalic trunc, common carotid arteries, aortic arch and descending aorta, confirming the diagnosis.

Fundoscopic assessment showed dilated veins, hypoperfused retinal areas and limited blood flow through the ophthalmic artery. Typical signs of vasculitis were absent. In addition to aspirin 100 mg, immunosuppression with prednisone (1 mg/kg bw) and AZA was initiated. The patient's symptoms gradually improved with residual discrete left handed paresis but the impaired vision persisted. ESR normalized (20 mm/h).

A first contrast-enhanced US (CEUS) of carotid arteries was performed before the patient started immunosuppression and showed a hypervascularization of the thickened vessel wall of the left axillary artery and discrete hypervascularization of the common carotid arteries, consistent with the PET results of increased FDG uptake in these arteries. CEUS was repeated 6 days, 3 and 8 months after start of treatment and showed persistent hyperechoic circumferential wall thickening and hypervascularization with more or less unchanged bubbles circulating in the walls of the mentioned arteries (Fig. 1). During the following months fatigue improved, ESR remained normal and prednisone could be tapered to 5 mg/day.

Three months after initiation of treatment our patient presented with two episodes of right-sided facial and brachial paresthesia, lasting 30–60 min, and worsening sight. Furthermore, the inflammatory parameters increased (ESR 42 mm/h), which also suggested activity of the vasculitis. Therefore, immunomodulation was intensified with tocilizumab [1, 2], AZA was stopped and steroid doses were transiently increased.

The patient remained free of further ischaemic events, the vision did not worsen and inflammatory parameters normalized again (ESR 9 mm/h; CRP was always normal). Steroids could be reduced to 5 mg. PET after 1 year confirmed decreasing FDG uptake of the common carotid arteries and the left axillary artery. MRI and CT-angiography did not show signs of progressive vasculitis.

The reduced vision (visual acuity on both sides 0.1–0.3) did not improve despite apparent control of systemic inflammation. Because of persistent limited cerebral perfusion (due to filiform stenosis of the supraaortal arteries) a surgical revascularization with a polytetrafluorethylene prosthesis from the ascending aorta to the right common carotid artery with additional branch to the right subclavian artery and to the left internal carotid artery was performed. The sight improved dramatically soon after surgery and normalized 3 months thereafter.

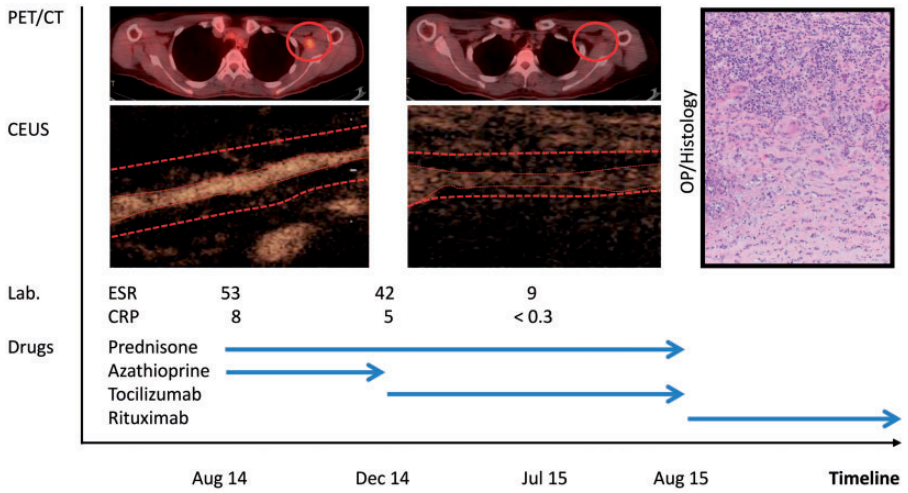
Histology of the resected right carotid artery showed active necrotizing vasculitis with a mixed inflammatory infiltrate including neutrophils, abundant CD20^{+} B cells, plasma cells and scattered giant cells. Due to the findings of an active vasculitis despite combination therapy of tocilizumab and prednisone and the abundance of B cells and plasma cells in the biopsy, treatment was switched to rituximab, initially 2 × 1 g, then 1 g 6 months thereafter, which has previously been reported to be effective in patients with TA [3]. The patient has since been free of new symptoms on 5 mg prednisone, 20 months after the first rituximab application.

The complexity of monitoring disease activity in patients with TA has increased after the introduction of IL-6 blockade because established activity scores include CRP or ESR (NIH, Indian TA score) [4, 5] and are thus potentially not sensitive enough [6, 7].

The Indian Takayasu activity score decreased in our patient from 16/51 to 4/51 before surgery. ESR/CRP and [^{18}F]FDG uptake in PET normalized after introduction of tocilizumab, while B-mode US and CEUS showed no substantial changes. The surprising finding of a highly active vasculitis within the resected carotid artery exemplifies (i) the still insufficient diagnostic accuracy of established criteria including imaging for follow-up of patients with TA and (ii) the multifaceted pathophysiology of the disease with a need for differentiated treatment decisions.

It is thus essential to further develop diagnostic tools to assess remission in TA (e.g. CEUS as shown here and by others [8]) and to critically reflect current treatment strategies in the light of the uncertainty of diagnostic means.

Fig. 1 Timeline of imaging and laboratory findings under immunosuppression



PET showed decreasing FDG uptake of the left axillary artery, whereas CEUS revealed no substantial changes under the pictured treatment. In contrast to the pleasant recovery of our patient, histology demonstrated active vasculitis. CEUS, contrast-enhanced US; FDG: fluorodeoxyglucose.

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