

Giant cell aortitis of the ascending aorta without signs and symptoms of systemic vasculitis

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Abstract

We report a case of a patient with giant cell aortitis – a rare cause of aneurysm of the ascending aorta. Modern imaging techniques show promise in diagnosis, however the diagnosis only after histopathological examination was revealed which changed the postoperative management - immunosuppression was started together with anticoagulation therapy. Aortic imaging was repeated to precisely assess the extent of the disease and also to monitor a long term clinical outcomes. JRC D 2012; 1: 10–12

Key words: Aortic aneurysm; Imaging; Surgery

Background

Giant cell arteritis (GCA) is a chronic inflammatory disease of the medium and large elastic arteries, especially cranial vessels, that predominantly occurs in the elderly. Aortic aneurysm or dissection affects only up to 18% of patients with GCA [1]. Diagnosis is often delayed due to poor recognition of early nonspecific symptoms. Laboratory inflammatory markers are often discordant with disease activity. Modern imaging techniques show promise in diagnosis and disease monitoring, however the management of these patients is still under discussion [2].

Case Presentation

A 71-year-old white Caucasian woman was referred to the Cardiac Surgery department because of the aneurysm of the ascending aorta. She complained of weakness, headache and shortness of breath at exertion. She had an anamnesis of arterial hypertension for more than 20 years and she was treated with angiotensin converting enzyme (ACE) inhibitors and beta-blockers.

Physical examination revealed normal, symmetrical peripheral pulse, regular heart rate, equal extremity blood pressure 150/90 mm Hg, no carotid and subclavian bruits, no clinical signs of heart failure.

The electrocardiogram showed sinus rhythm with left ventricular (LV) hypertrophy.

• Biochemical analysis revealed normal serum levels of inflammatory markers: C-reactive protein (CRP) was 3.94 mg/l, erythrocyte sedimentation rate (ESR) – 18 mm/h and test for syphilis was negative.

• Transthoracic echocardiography disclosed the aneurysm of ascending aorta (57 mm) and slightly dilated proximal part of aortic arch (39 mm), tricuspid aortic valve with moderate regurgitation (functional type I) [3], LV hypertrophy and preserved LV systolic function.

• Computed tomography with 3D reconstruction confirmed the results of the cardiac echo study. Detailed aortic diameters were calculated (Figure 1–3).

• Conventional angiography was performed in which normal coronary arteries were found.

• The patient underwent *valve sparing surgery* – prosthesis of the ascending aorta and proximal part of arch (No. 26) and reconstruction of the aortic valve. Histopathological examination of the aortic wall revealed inflammatory lesions beginning in the adventitia with the signs of vascular injury, signs of medial necrosis with inflammatory cells infiltrates composed of Langerhans and non-Langerhans giant cells and intimal proliferation (Figure 4, 5).

• The postoperative period was uneventful with only a subfebrile temperature episode about 1 week after surgery and no haemodynamic instability was observed. The biochemical analysis showed slower than usual reduction of CRP (61 mg/l postoperatively to 11.5 mg/l 2 months after surgery) and slight increase of ESR (38 mm/h) 2 months after surgery. Immunosuppression with methylprednisolone 40 mg/day was started together with anti-

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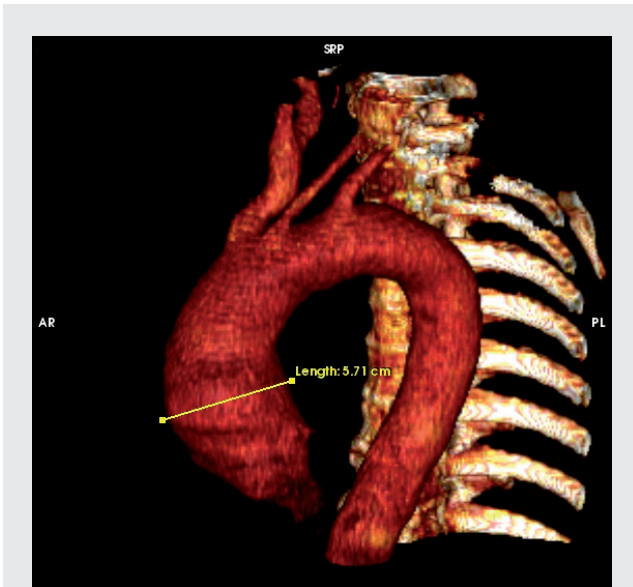


Figure 1. Assessment of aorta: computed tomography with 3D reconstruction, dilated ascending aorta is demonstrated

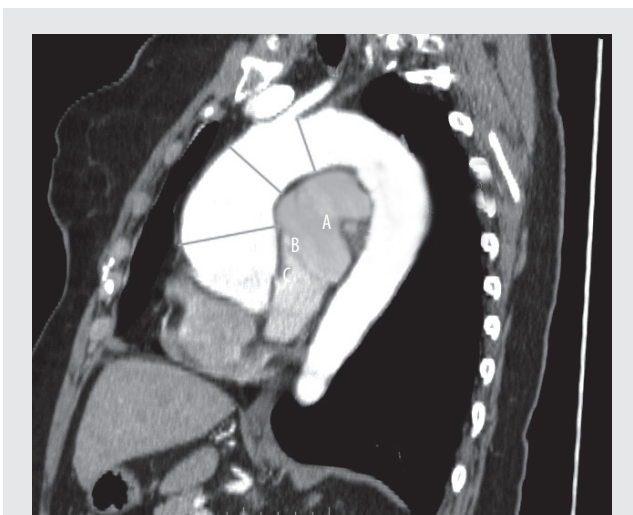


Figure 2. Computed tomography. Detail measurements of the aorta. Sagittal section of thoracic aorta is showing a significant dilated ascending aorta and slightly dilated aortic arch. A. Aortic arch diameter = 3.26 cm, B. Ascending aorta diameter = 4.07 cm, C. Aortic bulb diameter = 5.19 cm

coagulation therapy: warfarin 5 mg/d (INR – 2,4, planned value between 2 and 3) for the first 3 months after surgery followed by aspirin 100 mg/day later on. Additionally, metoprolol succ. 25–50 mg/day, perindopril/amlodipine 10/5 mg/day, spironolactone 25 mg/day and omeprazole 20 mg/day was administered.

Six months after surgery the patient was evaluated by computed tomography as a part of the post-discharge follow-up that showed no extent of the disease to the distal aortic segments.

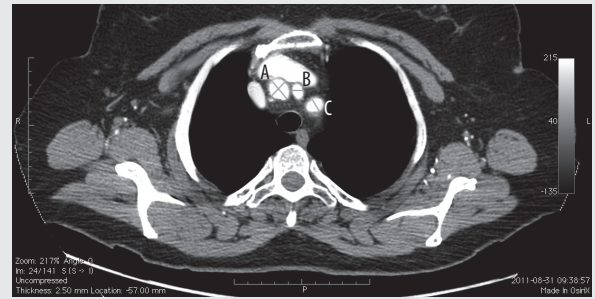
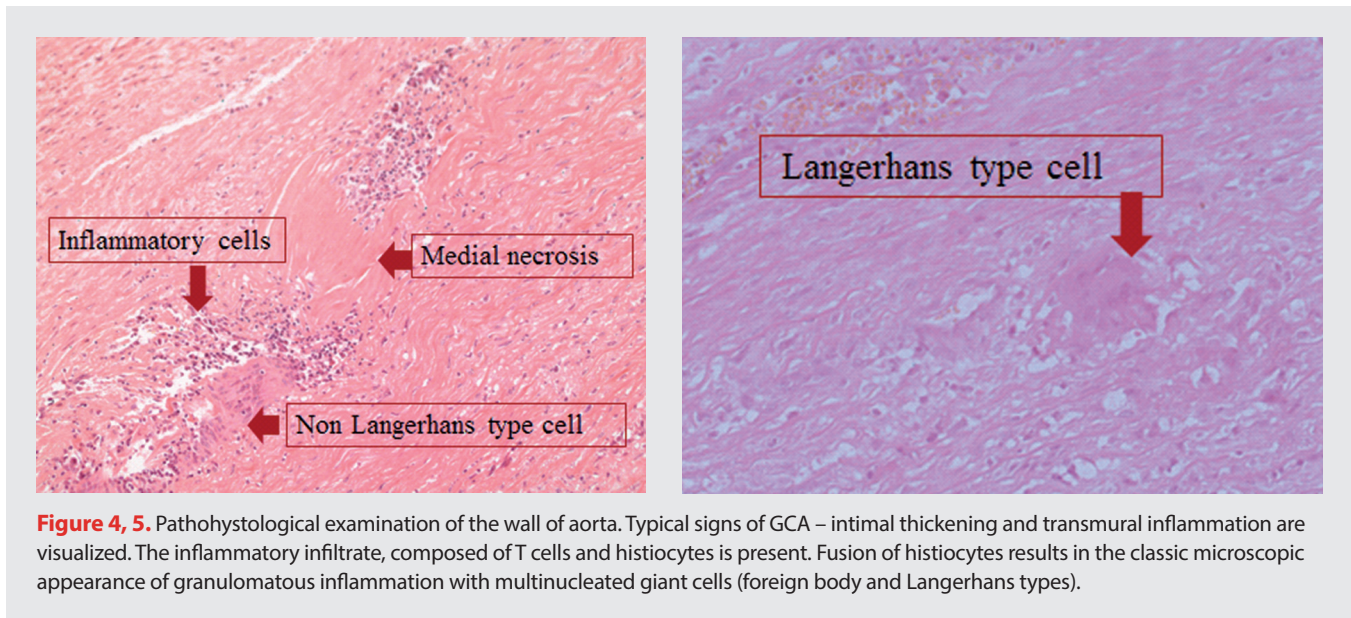


Figure 3. Transverse section of thoracic aorta. A. Ascending aorta diameters = 1.5 × 1.3 cm, B. Pulmonary artery diameter = 0.78 cm, C. Descending aorta diameter = 0.9 cm

Literature review

Giant cell arteritis (GCA) is the most common systemic vasculitis in Western countries. The estimated incidence in Europe in individuals over 50 years of age varies between 32 and 290/million/year with a two- to fourfold female predominance [1,2]. The clinical features are manifold, including ischaemic complications in regions supplied by affected arteries and symptoms of systemic inflammation. Permanent visual loss is the best-known and most feared complication of GCA, however, the patients can suffer ischaemic complications in vascular territories elsewhere in the body as well. The disease can be limited only to the ascending aorta without signs and symptoms of systemic vasculitis. In Olmstead County, 27% of the patients experienced large artery complications with an incidence of 30.5/1000 person-years at risk. Up to 18% were aortic aneurysm or dissection and 13% were cases of large artery stenosis [4]. Large vessels involvement was found to be less likely in patients with cranial symptoms and high inflammatory markers.

Diagnosis of the disease is often delayed due to poor recognition of early nonspecific symptoms. Raised inflammatory markers are highly sensitive for GCA diagnosis, still they are often discordant with disease activity. A normal ESR or CRP can be found in clinically active disease with vascular lesions on magnetic resonance imaging (MRI). According to the management recommendations for large vessel vasculitis, developed by European League against Rheumatism (EULAR) in 2009, histopathological evidence is the gold standard for the diagnosis of giant cell arteritis, despite the normal ESR and CRP values. A temporal artery biopsy is recommended to perform whenever a diagnosis of GCA is suspected, but this should not delay the treatment [2]. Meta-analysis showed that the prevalence of positive results of temporal artery biopsy in clinically suspected GCA was only 39% and was depended on pre-test probability and biopsy technique [5]. Biopsies taken during revascularization surgery have shown that inflammatory lesions can be found in disease previously thought inactive or of different etiology [1]. Modern noninvasive imaging techniques show promise in diagnosis and disease monitoring. High resolution multi-slice MRI contrast imaging has been used for diagnosis of GCA to picture superficial cranial and extra-cranial arterial disease and to demonstrate structural vascular abnormalities. Increased vessel wall thickness and oedema with increased mural enhancement post-contrast was suggested to correlate with the disease activity [6]. Positron Emission Tomography (PET) seems to be able to diagnose early large vessel arteritis, prior to diagnostic recognition of nonspecific early



symptoms and changes in other imaging modalities. It also has a value in assessing disease activity and its extent [7]. Ultrasonography shows promise in the diagnosis of the disease, however it does not have the prognostic value of histology, it requires a high level of training and it cannot be recommended as a replacement of temporal artery biopsy. Invasive angiography is generally not required for the management of the disease [1].

GCA management requires early intensive therapy with high dose glucocorticoids for induction of remission. The initial dose of prednisolone is 1 mg/kg/day (max 60 mg/day). This dose should be maintained for a month and tapered gradually subsequently. In clinical trials, the glucocorticoid dose was between 10–15 mg/day at 3 months [1,2,8]. The duration of glucocorticoid therapy for patients with GCA is variable and can be extended up to several years. Some patients, however, may not be able to tolerate complete discontinuation of glucocorticoid therapy due to disease recurrence or secondary adrenal insufficiency [2]. On the other hand, almost 86% of patients suffer from glucocorticoid related adverse events at 10-year follow-up [8]. In order to reduce the duration of glucocorticoid therapy, an adjunctive therapy with methotrexate was studied in three randomized controlled trials, demonstrating a modest role of methotrexate (10–15 mg/week) in reducing the relapse rate and lowering the cumulative dose of glucocorticoid therapy [2]. These patients are at an increased risk of developing cardiovascular and cerebrovascular events, thus addition of low dose aspirin protects against such complications. Gastrointestinal mucosal protection should be considered when commencing aspirin [2,9].

There are no valid biomarkers for assessing response and diagnosing relapse in large vessel arteritis [1]. For patients with GCA a relapse is usually associated with a rise in inflammatory markers. Importantly, asymptomatic, subclinical involvement of aorta is common and may progress to a form of aneurysm or dissection in 9–18% of patients. Aortic imaging is recommended in GCA for precise diagnosis of the disease extent and for monitoring of long-term clinical outcomes. An increased frequency of distal aortic events (new large aortic aneurysms, ruptured aortic aneurysms, new aortic dissections involving descending thoracic aorta and abdominal aorta, new aortic surgical procedures) on long term follow-up after surgery have been observed [2,10].

Conclusions

Giant cell arteritis is a rare cause of aortic aneurysm. Histopathological evidencing remains the gold standard for the diagnosis, despite the normal inflammatory markers. Management requires long term glucocorticoid therapy. Although, there is still lack of clinical trial evidences regarding the management of these patients, long-term glucocorticoid therapy is currently a standard treatment.

Conflict of interest: non declared.

References

- Borg FA, Dasgupta B. Treatment and outcomes of large vessel arteritis. *Best practice & Research Clinical Rheumatology* 2009; 23: 325–337.
- Mukhtyar C, Guilevin L, Cid MC, et al. EULAR recommendations for the management of large vessel vasculitis. *Ann Rheum Dis* 2009; 68: 318–323.
- Boodhwani M, Kerchove L, Glineur D, et al. Repair-oriented classification of aortic insufficiency: Impact on surgical techniques and clinical outcomes. *J Thorac Cardiovasc Surg* 2009; 137: 286–294.
- Nuenninghoff DM, Hunder GG, Christianson THJ, et al. Incidence and predictors of large artery complication (aortic aneurysm, aortic dissection and/or large artery stenosis) in patients with giant cell arteritis. *Arthritis Rheum* 2003; 48: 3522–3531.
- Smetana GW, Shmerling RH. Does this patient have temporal arteritis. *JAMA* 2002; 287: 92–101.
- Bley TA, Uhl M, Carew J, et al. Diagnostic value of high-resolution MR imaging in giant cell arteritis. *AJNR Am J Neuroradiol.* 2007; 28: 1722–1727.
- Walter M, Meizer RA, Schindler C, et al. The value of FDG-PET in the diagnosis of large vessel vasculitis and the assessment of the activity and extent of disease. *Eur J Nucl Med Mol Imaging* 2005; 32: 674–681.
- Proven A, Gabriel SE, Orces C, et al. Glucocorticoid therapy in giant cell arteritis: duration and adverse outcomes. *Arthritis Rheum* 2003; 49: 703–708.
- Lee MS, Smith SD, Galor A, et al. Antiplatelet and anticoagulant therapy in patients with giant cell arteritis. *Arthritis Rheum* 2006; 54: 3306–3309.
- Wang HE, Smith RN, Spooner AE, et al. Giant cell aortitis of the ascending aorta without signs or symptoms of systemic vasculitis is associated with elevated risk of distal aortic events. *Arthritis & Rheumatism* 2012; 64: 317–319.