Giant cell arteritis

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CASE PRESENTATION

DR. JEFF TAYLOR: A 73-year-old white man, who was known to have been previously treated for systemic hypertension, deep-vein thrombosis, and unilateral blindness (due to traumatic injury), was admitted from Titus County Hospital because of severe headaches. The headaches were similar to his previous “sinus headaches,” except they were more severe. The pain generally originated at the back of his head and radiated bilaterally toward both supraorbital areas, subsequently localizing over the left side of his face and head. The headaches were not preceded by any prodrome and were not associated with visual abnormalities, nausea, or vomiting. Although his symptoms were initially relieved with acetaminophen, antihistamines, and antibiotics, the headaches recurred and were more severe. He was given several injections that produced short-lasting relief. Subsequently, the left side of his face swelled. He also developed left jaw pain that occurred when chewing food. On his admission to Titus County Hospital, he had swelling and tenderness over his left neck and face. The left eye had been replaced with a prosthetic one several years earlier. There was no head or scalp tenderness.

He had normochromic, normocytic anemia (hematocrit, 36%). Routine chemistries and urinalysis were within normal limits. A chest radiograph showed a large mass in the aortic arch region. A chest computed tomography (CT) scan showed aneurysmal dilation of the aortic arch without dissection or rupture. The superior vena cava was slightly flattened, probably as a result of compression from the aneurysmal aorta. Further, a CT scan of the head and neck showed cerebral atrophy consistent with his age. Magnetic resonance imaging of the brain showed nonspecific small-vessel ischemic changes and small lacunar infarcts in the basal ganglia. Electroencephalogram and carotid Doppler studies were both within normal limits, and thyroid function studies were normal. The patient was transferred to Baylor University Medical Center (BUMC) for further evaluation and treatment.

A transurethral resection of the prostate gland had been performed in the distant past for benign prostatic hypertrophy. Following that procedure, the patient developed a deep venous thrombosis in his leg and was anticoagulated. He also had had a cholecystectomy. He was on doxazosin mesylate, but warfarin sodium had been stopped prior to transfer. Family history was significant for heart disease and cerebrovascular disease. He reported being married and working for a municipal parks department. He also reported no tobacco or alcohol use.
His blood pressure was 150/80 mm Hg; pulse, 58 beats per minute; and respiratory rate, 18 beats per minute. The patient was oriented and in no acute distress. He was normocephalic and had no scalp or head tenderness. His right pupil was round and reactive, with a normal funduscopic examination. The neck was supple. There was no swelling, but there was mild tenderness with palpation over the left side of the neck. There was no jugulovenous distention, bruits, thyromegaly, or lymphadenopathy. His chest was clear to auscultation, and the precordial examination disclosed no murmurs or gallops. The abdomen had normoactive bowel sounds. There was a healed surgical scar with no organomegaly or masses. He had no peripheral edema, and the peripheral pulses were normal. There was an old left ankle deformity. Cranial nerves were intact; deep tendon reflexes were normal with good strength in both arms and the right leg. His left lower leg muscles were weaker. The erythrocyte sedimentation rate was 58 mm/hr and the thyroid-stimulating hormone level was 0.84 ?U/mL. He had normochromic, normocytic anemia. A procedure was then performed.

DISCUSSION OF RADIOLOGICAL FINDINGS

DR. KENNETH L. FORD III: A posteroanterior image (Figure 1) and a lateral image (Figure 2) of the patient’s chest demonstrate a definite mass effect in the middle mediastinum, in the expected location of the aortic arch. On the lateral view, the aortic arch is enlarged, with a transverse cephalocaudal diameter of 6 cm. Also on the lateral view, there is a very small pleural effusion. There is no evidence of infiltrates, no rib abnormalities, and not much atherosclerotic change. There is no heavy calcium of the aortic wall or significant tortuosity of the aorta.

Because the aortic arch is enlarged, it is assumed that the mass is an aneurysm of the aortic arch or a dissection of the aorta. Other considerations could include a middle mediastinal mass surrounding the aortic knob, a lymphoma, or a central bronchogenic carcinoma, such as a small cell carcinoma.

Contrast-enhanced CT of the chest, as shown in Figures 3 and 4, confirms the suspicions on the chest radiograph and demonstrates enlargement of the transverse aorta or aortic arch. Again, the maximum transverse diameter is 6 cm. In the ascending aorta, the aortic transverse diameter should be <4 cm; in the descending thoracic aorta, it should be <3 cm. Thus, 6 cm satisfies size criteria for an aneurysm. This aneurysm is fusiform. A small left pleural effusion is present. There is no intimal flap inside this aorta, so aortic dissection is excluded.

The great vessels are not involved in the aneurysm. There is no evidence of thrombosis or dissection flaps in the great vessels. The ascending aorta is 4.5 cm in diameter and the descending thoracic aorta is 3.5 cm, i.e., not aneurysmal. In conclusion, we see a fusiform aneurysm of the aortic arch without evidence of atherosclerosis or dissection.

CASE DISCUSSION

DR. SUSAN S. BROWN: One fact of significance in this case is the patient’s age. He is 73 years old. The patient’s initial symptom on presentation was headaches, and that is significant. He did have some swelling of the left side of his face, and then he had jaw claudication on the left side. On examination, he had some swelling and tenderness over the
left neck and face. A pertinent negative was that he did not have head or scalp tenderness. Probably significant was that, because he had lost the left eye to trauma many years previously, he had no vision changes that we could rely upon in that eye. So we have lost what I believe to be a significant finding for our case. He also had an aneurysmal aortic arch. I do think the mild tenderness to palpation over the left side of the neck was significant. There were no bruits, and carotid Doppler results were negative. A significant cardiac examination finding was that there were no murmurs. The erythrocyte sedimentation rate was elevated, and he had mild normochromic anemia.

I will address the aneurysm first. The most common cause of aneurysm is atherosclerosis, particularly when it involves the abdominal aorta. Other etiologies of aneurysm include cystic medial necrosis, syphilis, other bacterial infections, rheumatic aortitis, and trauma. While abdominal aortic aneurysms usually are atherosclerotic in origin, thoracic aneurysms also can be atherosclerotic in origin. There are, however, more common causes of aneurysms in the thoracic aorta.

Cystic medial necrosis involves degeneration of collagen and the elastic fibers, and then deposition of a mucoid material in the aortic media, as is seen in Marfan syndrome and in other conditions, such as pregnancy. Cystic medial necrosis also can be seen in systemic hypertension, which our patient has. I do not think, however, that that is the etiology of his aneurysm.

Mycotic aneurysms can occur as a result of bacterial infection. Usually, one would find positive blood cultures. There was no mention of positive blood cultures on this patient, or of any blood cultures at all, for that matter.

Another broad category of aortic aneurysms in the thoracic area is that of aortitis. This category comprises 4 types: 1) rheumatic aortitis, 2) syphilitic aortitis, 3) Takayasu’s arteritis, and 4) giant cell arteritis.

The clinical manifestations of rheumatic aortitis are the development of an aneurysm, aortic regurgitation, and commonly a problem with the cardiac conduction system. I do not believe that rheumatic aortitis is the cause of this patient’s aneurysm.

Syphilitic aortitis is less common, and I have never seen a patient with it. Latent syphilis can go on for many years; then, as a late manifestation of the luetic infection, aortitis can develop and can be asymptomatic. Linear calcium deposits occur in the aorta in syphilis, but no aortic calcium was identified radiographically in the present patient. This patient certainly could have had a syphilitic aortitis, but there was no serological testing.

Takayasu’s arteritis is a third type of aortitis in the thoracic area and can lead to the subsequent development of an aneurysm. Takayasu’s arteritis also is known as aortic arch syndrome and is one of the causes of aortic arch syndrome aneurysms. Takayasu’s arteritis is much less common than giant cell arteritis, and giant cell arteritis is, itself, uncommon. In Takayasu’s arteritis, there is inflammation and then stenotic disease of medium- and large-sized arteries. Women are affected 4 times more often than men. It is less frequent in persons of European ancestry and is rarely present in people >40 years of age. I felt it would be uncommon to see Takayasu’s arteritis in a patient this age who was not Oriental. Takayasu’s and giant cell arteritis are systemic diseases. With a history of systemic
hypertension, we would have to wonder if his renal arteries had been evaluated.

*Giant cell arteritis*, also known as temporal arteritis, is the diagnosis that I believe best fits our patient. The disease is uncommon, occurring in 23 of 100,000 people (1). It affects persons >60 years old almost exclusively, is most commonly found in patients of Northern European ancestry, and is more common in women than in men. More than half of the patients present with polymyalgia rheumatica, which is closely associated with giant cell arteritis. Some of the tenderness over our patient’s neck could be tenderness over an involved carotid artery, or it could be tenderness from polymyalgia rheumatica with which he also presented. The classic complex involves fever, and we are not really told whether the patient had fever. Also, the fever, malaise, and weight loss occurred over a long period of time. This fact is really frightening, considering that the disease can affect vision so drastically.

Giant cell arteritis usually involves one or more branches of the carotid artery. In our patient, there were no bruits over the carotid arteries, and the carotid Doppler results were described as normal. I do not think he necessarily had any involvement of the carotid arteries. Again, giant cell arteritis is a systemic disease, involving arteries in many locations. I think there may well have been some involvement of other arteries in this patient. With the temporal artery involved, a headache is a very common presentation, and, of course, this patient presented with headache. The temporal artery area may be tender and associated with scalp pain and jaw claudication, which our patient had. Ischemic optic neuritis, which results in serious vision changes, may occur. Obviously, we did not have the opportunity to question this patient about his vision. Although most patients complain for months of symptoms related to their heads and eyes before the appearance of objective eye involvement, such eye involvement may occur. In such cases, corticosteroid therapy must be given quickly. Giant cell arteritis also may result in claudication of the extremities, stroke, aortic aneurysm, and infarctions of the visceral organs. Characteristic laboratory studies include an elevated erythrocyte sedimentation rate. Anemia is common. Abnormal liver function tests also may occur.

The diagnosis typically is confirmed by temporal artery biopsy; however, the findings can be negative. The patient’s response to treatment with corticosteroids can confirm the diagnosis if the temporal artery biopsy is negative.

I think our patient had *giant cell arteritis*, and I think the procedure done was a temporal artery biopsy.

**DISCUSSION OF PATHOLOGICAL FINDINGS**

DR. SETH W. COOK: We received a 5.5-cm left temporal artery biopsy that was grossly unremarkable. Cross-sections showed marked intimal edema and fibrosis with near total obstruction of the lumen. Numerous multinucleated giant cells were present within the media. A transmural chronic inflammatory cell infiltrate consisting mainly of lymphocytes with occasional plasma cells was present through the full thickness of the artery. Numerous Langhans’ and foreign-body type giant cells were present. Elastic fibers were disrupted and fragmented. All of these findings are consistent with the diagnosis of giant cell arteritis.
DR. TAYLOR: This patient, of course, had giant cell arteritis. Giant cell arteritis, or temporal arteritis, was first described in 1890 as a disease of middle-aged or older persons. It is a vasculitis affecting medium- and large-sized arteries, especially those branching from the aorta. In a Mayo Clinic study on giant cell arteritis, there was a reported prevalence of approximately 223 per 100,000 >50 years of age and an incidence of 17 per 100,000 >50 years of age (2). It is more common in women than in men, with a 3-to-1 ratio. It is also more common in whites than blacks, and familial cases have been reported. There is an association with the human leukocyte antigens DR7 and DR4, as well as an association with polymyalgia rheumatica. The pathologic mechanism of giant cell arteritis is not clear, but it appears to be an antigen-driven immune response with arterial damage as the secondary effect. Giant cell arteritis is associated with a markedly increased risk for the development of an aortic aneurysm, and in one study, patients with giant cell arteritis were 17 times more likely to develop a thoracic aortic aneurysm and 2.5 times more likely to develop an isolated abdominal aortic aneurysm, compared with controls (3).

The onset may be abrupt or insidious, with the development of nonspecific manifestations, such as malaise, fever, weight loss, scalp tenderness, and the most common symptom, headache. The temporal artery may be swollen, nodular, or thickened, and there may be a decreased pulse in the temporal artery. Visual symptoms include sudden visual loss, diplopia, and amaurosis fugax. Jaw claudication, as was present in this patient, is also a common symptom. Blood pressure may be lower in one arm than the other.

The erythrocyte sedimentation rate often is elevated to levels >70 mm/hr. A mild normocromic, normocytic anemia also is common, with occasional elevation in the platelet count. Hepatic enzymes may be slightly elevated, particularly the alkaline phosphatase, and albumin levels may be decreased. A conclusive diagnosis often can be confirmed with the biopsy specimen of an involved temporal artery. Bilateral temporal artery biopsy may be required, because this is a segmental disease and may be missed on the initial biopsy specimen.

Corticosteroids are the mainstay of treatment. Typically, initial doses of prednisone, 40 to 80 mg once or twice daily, are used. If visual symptoms are present, therapy should start immediately, and doses of up to 1 g per day of methylprednisolone sodium succinate for 3 days with a subsequent prednisone taper may be used. Clinical improvement usually is evident within 72 hours. The initial oral dose should be continued for 1 month. Then the patient should be reassessed and the erythrocyte sedimentation rate rechecked. If the patient is asymptomatic and the erythrocyte sedimentation rate has returned to normal, then the corticosteroid dose may be reduced 5 mg per week for 4 weeks. The erythrocyte sedimentation rate should be rechecked, and if it remains stable, then the dosage may continue to be tapered down to a maintenance dose of 10 mg per day.

With too rapid a reduction in dose, giant cell arteritis has a reported relapse rate of 25%. Therapy may be started prior to biopsy, with pathologic changes persisting for 5 to 20 days after the initiation of therapy. Most patients require 24 months of treatment. Prednisone-resistant giant cell arteritis may require cytotoxic medications, including methotrexate and cyclophosphamide.
This patient was placed on 80 mg of prednisone daily, and he improved within 48 hours. His aneurysm was unchanged. He was placed on metoprolol succinate (50 mg twice daily) and was discharged home. He is being followed by his primary care physician in Mount Pleasant. The corticosteroids are being gradually decreased, and he is doing well.

References


Figure 4