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Clinical Record

Takayasu's arteritis and saddle nose deformity: a new association

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Abstract
Aortitis and saddle nose deformity are extremely unusual manifestations of a variety of systemic diseases. The concurrent appearance of these apparently disparate clinical features is a clinical rarity. A case of saddle nose deformity in a patient with confirmed Takayasu's arteritis is presented. The relevant literature is reviewed with reference to the possible differential diagnosis of patients with aortitis and saddle nose deformity.

Key words: Takayasu's Arteritis; Nose Deformities, Acquired

Introduction

A saddle nose or pug nose deformity generally refers to an abnormally concave profile of the nasal dorsum. The underlying defect is a loss of structural support to the nasal dorsum, either bony, cartilaginous, or both. This results in cephalad rotation of the nasal tip, flattening of the nasal bridge, and gives the illusory appearance of increased intraocular distance.[1]

Trauma and septorhinoplastic surgery are the most frequent causes of saddle nose, but the deformity may also occur in a variety of systemic diseases, including Wegener's granulomatosis (WG), relapsing polychondritis (RP) and syphilis.[1–3] Takayasu's arteritis (TA) is a large vessel systemic vasculitis characterized by inflammation of the aorta and its main branches.[4] Saddle nose has not previously been described in association with this disease process.

A case of saddle nose deformity occurring in a patient with Takayasu's arteritis is presented. No other potential aetiologic factor has been identified. Following a detailed MEDLINE search, this report is the first to describe an association between this rare vasculitis and distinctive cosmetic deformity.

Case report

A 20-year-old female patient with known TA was referred to the Department of Otorhinolaryngology with a six-month history of progressive alteration in the shape of her external nose (Figure 1).

Eighteen months prior to this presentation, she had undergone medical investigation for a systemic illness initially characterized by non-specific symptoms such as headache, myalgia and fatigue. While under investigation, her condition acutely deteriorated and she developed severe hypertension and fulminant congestive cardiac failure. Examination at this time confirmed the presence of multiple bruits, mitral regurgitation and signs of congestive cardiac failure. Laboratory investigations revealed a normochromic, normocytic anaemia and an elevated ESR of 75 mm/hr, and a vasculitic disease was suspected. Further laboratory studies undertaken included rheumatoid factor, cANCA, pANCA, and antinuclear, antimitochondrial, antiparietal and antismooth muscle antibodies, which were all negative. Syphilis serology was negative. A chest X-ray showed cardiomyopathy but no evidence of pulmonary disease. Following renal angiography, which noted bilateral renal artery stenosis, a magnetic resonance angiogram (MRA) was performed with 3D reconstruction. High-grade stenoses of the vessels of the aortic arch were noted, including the left subclavian, left common carotid and left brachiocephalic arteries (Figure 2). A medium vessel arteritis, bilateral renal artery stenosis and mid-abdominal aortic stenosis were also observed. These findings, combined with the age of the patient, the clinical picture and the laboratory results, were consistent with TA. She was started on high-dose steroid therapy which resulted in a dramatic resolution of her systemic symptoms. The patient remained well on decreasing doses of steroids until a year after diagnosis, when she noticed that the shape of her external nose had changed. She was therefore referred to our service.

On direct questioning she admitted that six months earlier she had suffered from nasal crusting and intermittent epistaxis over an eight-week period. This had subsequently fully resolved. She denied any nasal trauma or previous nasal surgery. She also denied any illicit nasal drug use. Examination of the external nose confirmed a saddle nose deformity with cephalic tip rotation. Rigid nasendoscopy was performed and a large posterior bony perforation was noted. The sinonasal mucosa, however, was entirely normal. A computed tomography (CT) scan confirmed the presence of the bony septal defect and the absence of mucosal disease within the nose and paranasal

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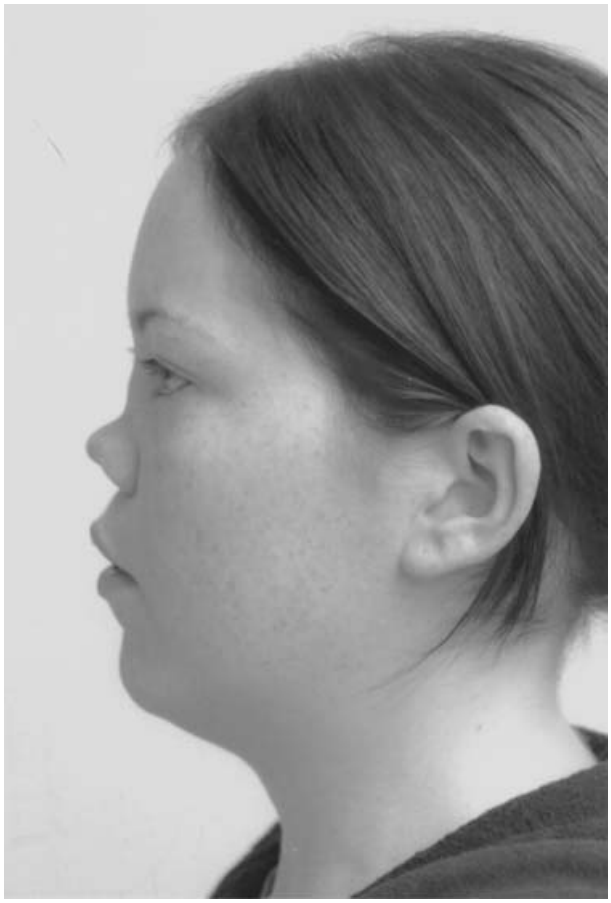

FIG. 1
Profile of the saddle nose deformity with cephalad tip rotation.

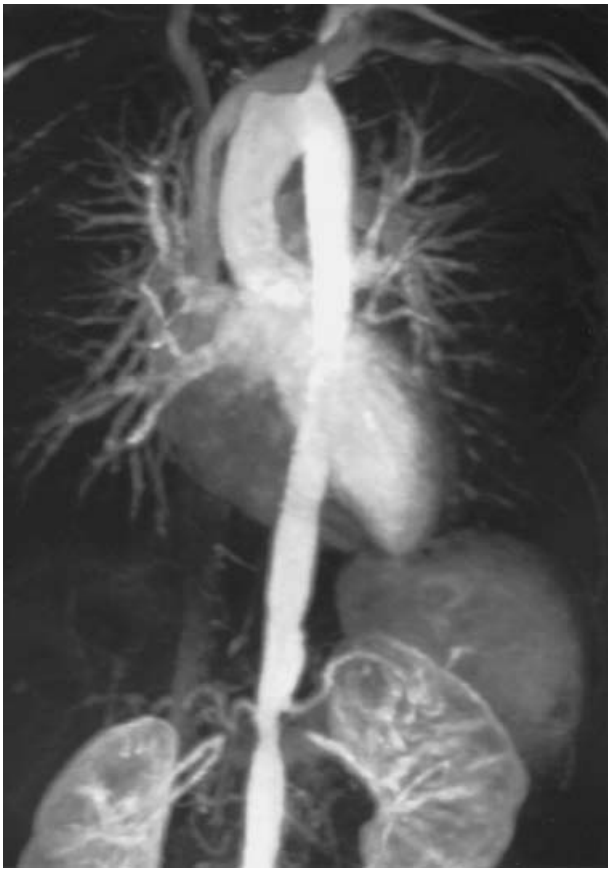

FIG. 2
MR angiogram showing abdominal aortic stenosis and multiple stenoses of the left common carotid, subclavian and brachiocephalic arteries.

sinuses (Figure 3). Several key laboratory studies were repeated, including cANCA, pANCA, syphilis serology and serum ACE. All were negative.

Following an in-depth discussion with the patient regarding the reconstructive options, surgery was declined.

Discussion

Takayasu's arteritis is a chronic inflammatory and fibrosing arterial vasculitis affecting large and medium-sized vessels, namely the aorta and its main branches.[4] It is predominantly a disease of young women, most frequently presenting between 10 and 40 years of age.[4,5] It is more prevalent in Asian populations, but is increasingly recognized in all races. The reported annual incidence in the United States is 2.6 cases per million per year.[5] The characteristic vascular lesion is an irregularly thickened vessel wall with areas of focal stenosis.[4] Secondary aneurysms may occur.

Generalized vague symptoms are often the presenting features, including fever, night sweats, myalgia, arthralgia and anaemia.[6] The non-specificity of these symptoms often delays correct diagnosis.[7] Disease progression results in the appearance of characteristic clinical features related to vascular lesions, including bruits, absent or diminished pulses, claudication of upper and lower extremities, hypertension, retinopathy and congestive cardiac failure.[8] No single investigation is diagnostic for TA. Diagnosis is based on the presence of at least three out of six of the criteria laid down by the American College of Rheumatology guidelines.[9] These criteria are derived from the following: age less than 40 years, claudication of extremities, decreased pulsation of the brachial arteries, difference of at least 10 mmHg in systolic blood pressure between the arms, bruits of the subclavian artery or aorta, and angiographic evidence of stenosis or occlusion of the aorta or its major branches.[9] Our patient fulfilled the criteria for the diagnosis of TA.

The association between saddle nose deformity and TA has not previously been reported. Thus, consideration must

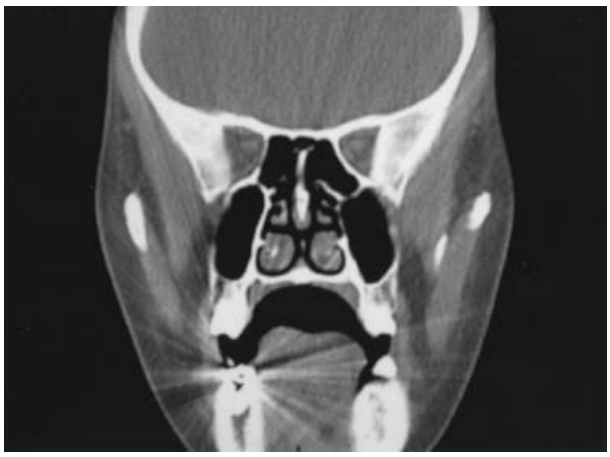

FIG. 3
Coronal CT scan of the nose and paranasal sinuses showing bony septal defect with no associated mucosal disease.

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be given to alternative diagnoses of pathologic entities capable of causing an aortitis and saddle nose concurrently. Only a limited number of such diseases exist, which may be broadly divided into two categories, infective and non-infective.

Syphilis is a complex systemic illness caused by the spirochaete *Treponema pallidum*.[10] It may be congenital, secondary to *in utero* infection, or acquired secondary to intimate sexual contact. Its clinical manifestations are many and varied, as witnessed by its title 'the great imitator'.[10,11] Saddle nose deformity may appear as part of the congenital form, or in the late tertiary acquired form of the disease with gumma formation.[10] The underlying pathologic lesion is an obliterative endarteritis and periarteritis. The aorta may be affected in this vasculitic process.[12] Our patient had negative serology for syphilis. Tuberculosis is a re-emerging worldwide health threat.[13] Although extrapulmonary manifestations are well recognized, aortitis is very uncommon and sinonasal involvement and saddle nose are rare sequelae.[13–15] However, no cases have been documented of synchronous aortitis and saddle nose deformity due to TB, and in the absence of any contacts or evidence of pulmonary disease this possibility was eliminated from the differential diagnosis in our case.

The non-infective diseases with the potential to affect both the nose and the large arteries are Wegener's granulomatosis, relapsing polychondritis, rheumatoid arthritis and sarcoid. Wegener's granulomatosis (WG) is a non-caseating granulomatous disorder characterized by a necrotizing vasculitis with a predilection for the upper and lower respiratory tracts and kidneys.[16] Although classified in the Chapel Hill criteria as a small vessel vasculitis, aortitis has been known to occur in WG.[17,18] The association of WG with the saddle nose deformity is well documented.[19] More recently the detection of antineutrophil cytoplasmic antibodies (ANCA), particularly the cytoplasmic form (cANCA), has become an important addition to the diagnostic investigations in patients with suspected WG.[20] Although cANCA negativity has been reported in up to 10 per cent of cases of limited WG, cases involving the aorta would be fulminant and one would expect a positive antibody result.[21] Another factor counting against WG in the presented case is the excellent response to steroid treatment alone, which again would favour the diagnosis of TA. Likewise, the absence of other manifestations of WG, including otologic, airway and pulmonary lesions, counts against this diagnosis. Relapsing polychondritis (RP) is a rare, severe episodic inflammatory disorder involving cartilaginous structures such as the pinna, nose, laryngotracheobronchial tree and connective tissues.[3] Saddling of the nose is a well recognized feature, occurring in about 30 per cent of cases.[3] Aortitis has also been documented with this condition in anecdotal case reports.[22] Auricular chondritis is the commonest manifestation of RP.[3] Diagnosis is based on the McAdam criteria,[23] which were not fulfilled by our patient. Severe rheumatoid arthritis has been associated with aortitis in rheumatoid factor-positive disease.[24] One case of nasal cartilaginous involvement has been identified, making the coexistence of nasal saddling and aortitis extremely unlikely.[25] Also, our case was rheumatoid factor negative and had no stigmata of rheumatoid disease, such as nodules or arthropathy. Sarcoid is a systemic granulomatous disorder which may rarely involve the nose and paranasal sinuses, including saddle nose in severe cases.[26] Large vessel vasculitis is not a recognized feature of this entity, but a case of sarcoid and aortitis has been recorded.[27] Serum ACE may be helpful in diagnosis but was negative in our patient, whose lack of pulmonary pathology ruled out sarcoid as a diagnostic possibility.

The possibility of dual pathology, including cocaine use resulting in destruction of the nasal cartilage, must be considered, or a combination of any of the aforementioned diseases causing aortitis is another potential cause of these apparently disparate clinical entities.[28,29] In this case, there was no evidence of such dual pathology or illicit drug use.

The overlapping features of many of the vasculitides and limited disease variants means that inevitably the nomenclature ascribed to any particular vasculitic process may change over time as the disease process evolves and reponse to treatment is assessed. In the presented case, however, the current working diagnosis is TA with a saddle nose deformity not attributable to any other pathologic process. This is a previously undocumented association and the otolaryngologist should include TA in the differential diagnosis of the aetiology of saddle nose deformity.

- **Takayasu's arteritis (TA) is a chronic inflammatory and fibrosing arterial vasculitis affecting the aorta and its branches**
- **This case report describes a previously unreported association between TA and saddle nose deformity**
- **The differential diagnosis of saddle nose deformity is discussed**

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