CASE REPORT

Saddle-nose and bilateral cauliflower ear deformities with pyoderma gangrenosum-like ulcers, cavitary pulmonary lesions, digital gangrene and pulselessness in a young female

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SUMMARY

We report a young female who presented with saddle-nose and bilateral cauliflower ear deformities along with pyoderma gangrenosum-like ulcers, digital gangrene and pulselessness. Subsequently, she was found to have bilateral conductive hearing loss, a corneal opacity, mild aortic regurgitation and radiological evidence of cavitary changes in lungs and aortoarteritis. Our patient had a constellation of symptoms which posed a diagnostic challenge. Finally, a diagnosis of relapsing polychondritis with several unusual features was made. Overlap with Takayasu's arteritis and granulomatosis with polyangitis, which has been reported rarely in the literature, cannot be excluded.

BACKGROUND

Relapsing polychondritis is an uncommon episodic inflammatory condition that affects predominantly the cartilages of ears, nose and laryngotracheobronchial tree. It can also affect other organs like eyes, joints, skin, cardiovascular and central nervous system. A variety of cutaneous and systemic features can be seen in relapsing polychondritis. However, it is uncertain whether these manifestations occur as a part of relapsing polychondritis or due to another coexisting rheumatological disease. We present a case of relapsing polychondritis in a young female with several unusual features, for which a possibility of overlap with Takayasu's arteritis and granulomatosis with polyangitis was considered.

CASE PRESENTATION

A 22-year-old female presented to us with an 8-year history of recurrent tender nodules on bilateral legs and around ankles which used to form painful ulcers and heal gradually over a period of 2–3 months. She had noticed a gradual flattening of her nose, while both her ears had become 'droopy' over the last few years after recurrent episodes of painful erythematous swelling affecting her ears. For the last 1 year, many of her fingers and toes had been progressively 'turning black'. Her medical history was significant for non-productive cough and breathlessness on mild exertion for 5 years, along with intermittent episodes of epistaxis and bilateral ear discharge and undocumented weight loss for 2 years. She denied history of fever, arthralgias, oral or genital ulcers,

stridor, hoarseness or choking episodes, pain or redness in eyes, Raynaud's phenomenon and blood in sputum, urine or stool. She was evaluated elsewhere 1 year back, where a diagnosis of granulomatosis with polyangitis was made based on her symptoms and a positive ELISA for cytoplasmic-antinuclear cytoplasmic antibody (c-ANCA), chest radiograph showing nodular opacities in bilateral upper zones and a skin biopsy reported as 'vasculitis'. Treatment with six cyclophosphamide (15 mg/kg) monthly pulses, daily azathioprine (100–150 mg/day) and variable doses of oral prednisolone led to healing of her leg ulcers, improvement in chest symptoms and weight gain. However, similar cutaneous ulcers started developing again 2 months after discontinuation of this treatment, and she was referred to us for further management. At presentation, she had a saddle-nose deformity and bilateral ears were cauliflower shaped (figure 1). There were multiple (8–10 in number) well-defined round-to-oval tender ulcers (1–8 cm) with violaceous margins and healthy granulation tissue with mild seropurulent discharge on the floor, over dorsum of bilateral feet and legs. The skin surrounding the leg ulcers was dusky erythematous (figure 2A). There was gangrene affecting second to fourth digit of left hand and all the toes and flexion deformity at multiple proximal interphalangeal joints of fingers (figure 2B,C). Her peripheral pulses (brachial, radial, popliteal, anterior tibial and dorsalis pedis arteries) were not palpable and blood pressure was unrecordable in all four limbs. A bruit could be auscultated over her bilateral carotid and subclavian arteries. The rest of the systemic examination was unremarkable.

INVESTIGATIONS

Complete blood counts and serum biochemistry, including fasting lipid profile were within normal limits. Erythrocyte sedimentation rate was raised (32 mm/hour) and C-reactive protein levels were normal (1.2 mg/L). ELISA for antinuclear cytoplasmic antibody, rheumatoid factor, lupus anticoagulant, anticardiolipin, beta-2 glycoprotein, HIV, hepatitis B surface antigen and antihepatitis C virus antibody were negative. Cryoglobulins and serum and urine protein electrophoresis were within normal limits. There were no casts or active

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Figure 1 Saddle-nose and cauliflower ear deformities.

sediments on urine examination. Skin biopsy from edge of the ulcer over leg showed irregular acanthosis with neutrophilic spongiosis, lymphohistiocytic perivascular infiltrate in the dermis and dermal fibrosis. Ophthalmological examination was significant for a left 0.5×0.5 cm nebulomacular corneal opacity. There was bilateral tympanic membrane perforation with conductive deafness. Chest X-ray showed fibrobronchiectatic changes in bilateral upper zones with associated pleural thickening while a contrast-enhanced CT revealed fibrobronchiectatic and cavitary changes in bilateral upper lobes and left lingular lobes with calcified mediastinal lymphadenopathy (figure 3A). Destruction of nasal septum and mucosal thickening of left maxillary sinus was detected on CT examination of paranasal sinuses (figure 3B). CT angiography showed thickening of vessel wall of aortic arch (figure 3C) and its branches. There was midsegment subclavian occlusion (right>left) and ostioproximal subclavian occlusion. Ostioproximal stenosis of left common carotid and innominate artery with reformation of distal axillary arteries bilaterally through collaterals was seen which had complete run-off but poor calibre distally (figure 3D). Abdominal aorta and branches were not affected. Bilateral lower limbs had mild popliteal stenosis and right limb had poor run-off. Diffuse distal disease in right peroneal artery and right distal anterior tibial artery was there. Left infrapopliteal segment could not be assessed due to significant venous overlap. Echocardiography showed mild aortic regurgitation with normal biventricular function. There was no evidence of metabolically active disease on positron emission tomography CT.

DIFFERENTIAL DIAGNOSIS

The combination of cauliflower ears and saddle-nose deformity is typical of relapsing polychondritis. However, certain findings

Figure 2 (A) Well-defined oval ulcer with irregular violaceous margins and healthy granulation tissue. (B,C) Gangrene of multiple fingers and toes along with flexion deformity at proximal interphalangeal joints.

in our patient suggested alternate possibilities: pulselessness, carotid bruit, features of aortoarteritis and aortic regurgitation point towards Takayasu's arteritis, while secretory otitis media, conductive hearing loss, radiographic evidence of sinus and lung involvement and c-ANCA positivity are characteristic of granulomatosis with polyangitis. Interestingly, these entities are known to share many features like constitutional symptoms and pyoderma gangrenosum-like leg ulcers. Notably, relapsing polychondritis can have associated small, medium or large vessel vasculitis or an overlap with Takayasu's arteritis or granulomatosis with polyangitis, thus accounting for all the features.

TREATMENT

The patient was treated with prednisolone 40 mg/day, azathioprine 50 mg twice daily, aspirin 75 mg twice daily and cilostazole 100 mg twice daily orally along with pulsed steroids (100 mg

Figure 3 (A) CT chest (coronal MPR): bilateral apical segments show fibrobronchiectatic changes with bullae formation (arrow). (B) Axial CT paranasal sinuses: left maxillary sinusitis with mucoperiosteal thickening and nasal bone and cartilage erosion. The arrow marks the expected normal location of nasal cartilage (midline). (C) Axial CT chest: thickening of wall of aorta at the level of aortic arch (arrow). (D) CT angiography: white arrows indicate bilateral subclavian stumps with bilateral subclavian occlusion. Yellow arrow shows stenosed left common carotid artery. Also seen is reformation of brachial arteries through collaterals around shoulder region and via corkscrew collaterals from posterior intercostal arteries (branches of aorta).

dexamethasone intravenous for 3 consecutive days every month). Amputation was done for gangrenous digits.

OUTCOME AND FOLLOW-UP

The brachial pulses became palpable after only 4 weeks of this treatment, accompanied by complete healing of ulcers in 7 months (figure 4). Daily oral prednisolone was slowly tapered and stopped in 2 months, while continuing the monthly dexamethasone pulses, azathioprine and blood thinners. Until now, she has received 13 months of this treatment, with no recurrence of ulcers, gangrene or chondritis.

DISCUSSION

Relapsing polychondritis is an episodic and progressive inflammatory condition involving cartilaginous structures, predominantly those of nose, ears and laryngotracheobronchial tree. Nasal and auricular chondritis can result in typical saddle-nose and cauliflower ear deformities respectively, while respiratory tract involvement can be potentially fatal due to airway obstruction or collapse. Non-erosive arthritis and ocular inflammation are also seen in majority of the patients. Skin, cardiovascular, central nervous and renal systems are less commonly affected. Cutaneous manifestations can be varied and include small vessel vasculitis, livedo reticularis, erythema nodosum, erythema elevatum diutinum, superficial thrombophlebitis or pyoderma gangrenosum-like ulcers, like in our patient.^{1 2} Our patient fulfilled three (bilateral auricular chondritis, nasal chondritis and ocular inflammation) out of six criteria required for diagnosing relapsing polychondritis.³ In addition, she also satisfied three (age at onset <40 years, subclavian bruit, compatible arteriographic abnormalities) out of the six proposed criteria

Figure 4 Complete healing of the ulcers (7 months after starting treatment).

for Takayasu's arteritis⁴ and also two (epistaxis, abnormal chest imaging) of the four criteria for diagnosis of granulomatosis with polyangiitis.⁵

Takayasu's arteritis is a large vessel vasculitis causing progressive occlusive disease of the aorta and its branches, pulmonary and renal arteries. On the other hand, granulomatosis with polyangiitis is a multisystem vasculitis involving small to medium sized vessels, characterised by a triad of necrotising granuloma of respiratory tract, small vessel vasculitis and focal necrotising glomerulonephritis.⁶ Interestingly, the cutaneous lesions in our patient (erythematous nodules, pyoderma gangrenosum-like ulcers), including digital gangrene have been described in both Takayasu's arteritis and granulomatosis with polyangiitis.^{7 8} However, auricular and nasal chondritis do not occur in Takayasu's arteritis. While saddle-nose deformity can occur in granulomatosis with polyangiitis, auricular chondritis and large vessel vasculitis are unusual. It is noteworthy that cardiovascular complications like aortitis and valvular insufficiency can develop in 24%–52% patients of relapsing polychondritis, even those not fulfilling the criteria for Takayasu's arteritis.⁹ Even c-ANCA, which is considered to distinguish it from granulomatosis with polyangiitis, can be positive in relapsing polychondritis. Rising c-ANCA titres in relapsing polychondritis may reflect active vasculitis.¹⁰ Approximately 30% of patients with relapsing polychondritis can have another associated rheumatological disease, including Takayasu's arteritis and granulomatosis with polyangiitis.¹¹ In a series of 180 patients with relapsing polychondritis, only three satisfied the diagnostic criteria of Takayasu's arteritis.¹² Patients with features of both relapsing polychondritis and granulomatosis with polyangiitis have only been seldom reported.^{13–15} However, we could not find any report of relapsing polychondritis fulfilling the

diagnostic criteria for both Takayasu's arteritis and granulomatosis with polyangiitis in the literature.

To conclude, patients with relapsing polychondritis often present with a myriad of clinical features, and to label such patients as an overlap syndrome or not may be a question of mere nosology, as the prognosis and treatment depends not on what diagnostic label is used but which organ's systems are affected and the severity of involvement.

Learning points

- ▶ Patients presenting with features of relapsing polychondritis merit a detailed systemic evaluation.
- ▶ Medium or large vessel vasculitis in these patients could be a manifestation of relapsing polychondritis per se or that of a coexisting rheumatological disease.
- ▶ Treatment and prognosis should be dictated by the systemic involvement instead of the diagnostic label used for these patients.

Contributors SS: resident in charge of case and preparation of manuscript. VG: resident in charge of case and editing of manuscript. AC: preparation of manuscript and expert radiological opinion. KKV: editing of manuscript.

Competing interests None declared.

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