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CASE REPORT

Coexistence of Takayasu Arteritis, Rheumatoid Arthritis and Autoimmune Hypothyroidism: A Case Report

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Abstract

Background: Takayasu arteritis, rheumatoid arthritis, and autoimmune hypothyroidism are immune-mediated disorders that rarely coexist in a single patient. Their concurrence represents an important example of polyautoimmunity and may create diagnostic and therapeutic challenges.

Case presentation: A 45-year-old Sudanese woman presented with acute gastrointestinal symptoms and a history of chronic symmetrical inflammatory arthritis affecting the small joints of both upper limbs. Physical examination revealed absent upper-limb pulses, carotid bruits, and diffuse goiter. Laboratory testing demonstrated positive anti-cyclic citrullinated peptide antibodies consistent with rheumatoid arthritis according to the 2010 ACR/EULAR classification criteria. Thyroid function tests revealed markedly elevated TSH and low T4 levels consistent with autoimmune hypothyroidism. Computed tomography angiography showed inflammatory thickening of the aortic arch with occlusion and stenosis of major branches fulfilling the American College of Rheumatology (ACR) criteria for Takayasu arteritis.

Conclusion: This case highlights the importance of recognizing polyautoimmunity and emphasizes the need for multidisciplinary evaluation when vascular, rheumatologic, and endocrine manifestations coexist.

Background

Autoimmune diseases frequently occur together in the same individual due to shared genetic, hormonal, epigenetic, and immunological pathways. This phenomenon is referred to as polyautoimmunity and has important implications for

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diagnosis and management [1]. Women are disproportionately affected due to hormonal influences and X-chromosome-related immune regulation.

Takayasu Arteritis (TAK) is a chronic granulomatous vasculitis affecting the aorta and its major branches and primarily affects young women [2-4-7]. Clinical manifestations include diminished pulses, vascular bruits, limb claudication, and hypertension.

Rheumatoid Arthritis (RA) is a systemic autoimmune disease characterized by persistent synovitis, symmetric joint involvement, and autoantibody production including anti-cyclic citrullinated peptide antibodies [8]. Autoimmune hypothyroidism, most commonly Hashimoto thyroiditis, is the most frequent organ-specific autoimmune disease and may coexist with RA [9,10].

Case Presentation

A 45-year-old Sudanese woman presented with a one-day history of severe watery diarrhea without blood or mucus accompanied by abdominal pain. She reported chronic symmetrical inflammatory joint pain involving the small joints of both hands with morning stiffness.

On examination she appeared ill. Cardiovascular examination revealed absent radial and brachial pulses bilaterally with audible carotid bruits. Blood pressure measured from the popliteal artery was 180/60 mmHg. Neck examination revealed a diffuse goiter.

Laboratory investigations showed ESR 80 mm/hr, positive anti-CCP antibodies, TSH 35 mIU/L, and reduced T4 levels. Stool examination revealed Giardia trophozoites explaining the acute gastrointestinal symptoms (Table 1).

Computed tomography angiography demonstrated inflammatory thickening of the aortic arch with occlusion of the right subclavian artery, marked stenosis of the left subclavian artery, and extensive collateral circulation (Figures 1-5).

Table 1: Laboratory investigations.

Test	Result
WBC	15.8 × 10^3/μL
ESR	80 mm/hr
Hemoglobin	14 g/dL
Platelets	311 × 10^3/μL
Anti-CCP	Positive
ANA profile	Negative
TSH	35 mIU/L
T4	0.34
Stool exam	Giardia trophozoites

Based on clinical and imaging findings, Takayasu arteritis was diagnosed according to the American College of Rheumatology (ACR) classification criteria [11]. Rheumatoid arthritis was diagnosed according to the 2010 ACR/EULAR criteria supported by chronic symmetrical inflammatory arthritis and positive anti-CCP antibodies. Thyroid function tests confirmed primary autoimmune hypothyroidism.

Management: The patient was treated with systemic corticosteroid therapy for Takayasu arteritis and disease-modifying antirheumatic therapy for rheumatoid arthritis. Levothyroxine replacement therapy was initiated for hypothyroidism, and antiparasitic therapy was administered for giardiasis. The patient showed clinical improvement with reduction of inflammatory markers during follow-up (Table 1).

Discussion

The coexistence of multiple autoimmune diseases reflects the concept of polyautoimmunity, where shared genetic susceptibility and immune dysregulation predispose individuals to more than one autoimmune disorder [1]. Several mechanisms have been proposed including common HLA haplotypes and overlapping inflammatory

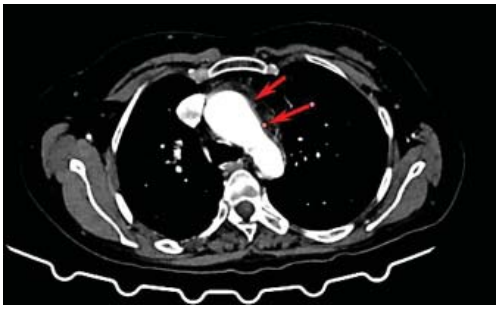

Figure 1 Axial image inflammatory thickening of aortic wall (red arrows) at the level of arch of aorta.

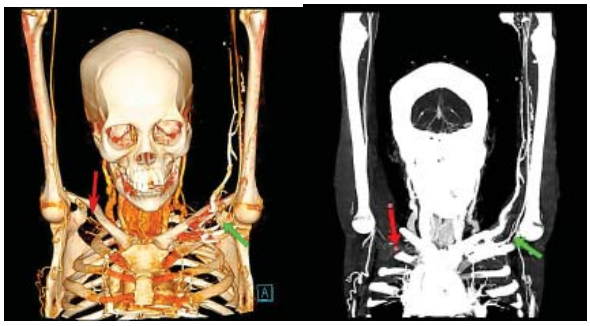

Figure 2 3 D volume rendering & MIP images after removal of clavicles showing complete occlusion of right subclavian artery (red arrow) & near total occlusion of left subclavian artery (green arrow) with filling of axillary & brachial arteries by collaterals.

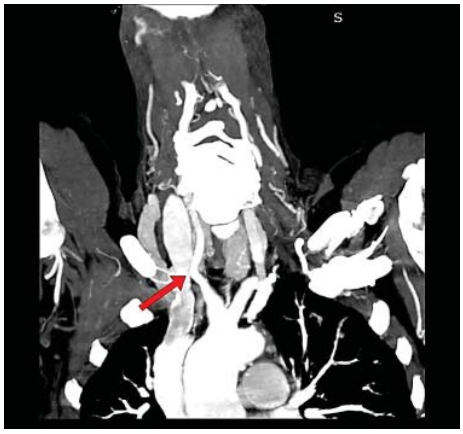

Figure 3 Coronal MIP image showing complete occlusion of right subclavian artery at its origin (red arrow).

cytokine pathways such as IL-6 and TNF-α.

Previous reports have documented coexistence of Takayasu arteritis with rheumatoid arthritis. Nasu T, et al. [12] described cases where patients presented with features of both conditions, suggesting shared immunopathogenic mechanisms involving Th1 and Th17 immune responses [12-14].

Autoimmune thyroid disease is also frequently associated with rheumatoid arthritis. Studies have demonstrated a higher prevalence of autoimmune thyroid disorders among patients with RA compared with the general population [8-10]. Shared susceptibility genes such as HLA-DRB1 and CTLA4 may contribute to this relationship.

However, the simultaneous occurrence of Takayasu arteritis, rheumatoid arthritis, and autoimmune hypothyroidism is extremely rare. Reporting such cases contributes to better

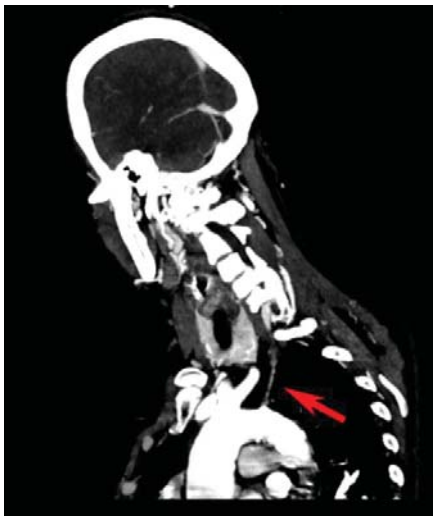

Figure 4 Sagittal MIP images in left anterior oblique view showing remarkable stenosis of left subclavian artery starting from its origin at aortic arch with beaded appearance representing alternating aneurysmal changes.

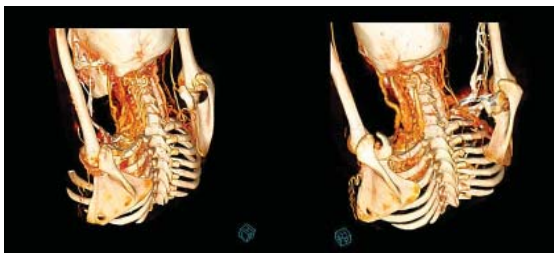

Figure 5 3 D images posterior views showing collaterals around scapulae reconstituting axillary & brachial arteries.

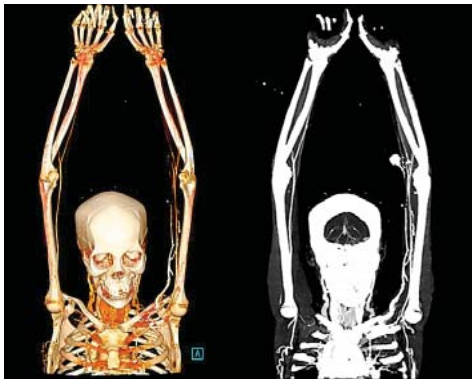

Figure 6 3 D anterior view & coronal MIP images demonstrating filling of axillary & brachial arteries with preserved flow at radial & ulnar arteries.

understanding of polyautoimmune syndromes and highlights the need for comprehensive multidisciplinary evaluation [15,16].

Conclusion

This case emphasizes the importance of considering polyautoimmunity in patients presenting with multisystem inflammatory manifestations and highlights the need for coordinated multidisciplinary care.

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