

False-Positive ANCA in a Patient with Mature Ovarian Teratoma: A Case Report and Literature Review

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Received: April 26, 2026; **Accepted:** May 20, 2026; **Published:** June 01, 2026

Abstract

Antineutrophil cytoplasmic antibodies (ANCA) are valuable biomarkers in the diagnosis of ANCA-associated vasculitis. However, false-positive ANCA results may occur in infectious, inflammatory, autoimmune, and neoplastic disorders. We report the case of a 39-year-old woman with a history of salicylate and nonsteroidal anti-inflammatory drug allergy, depression treated with escitalopram, late-onset asthma under maintenance therapy, and previous mild eosinophilia. She was referred for suspected vasculitis after positive ANCA testing. Clinical examination was unremarkable. Laboratory investigations showed normal renal function, negative proteinuria, normal urinary sediment, and no eosinophilia at admission. ANCA testing revealed low-titer positivity (1/10). No clinical manifestations suggestive of systemic vasculitis were identified. Chronic pelvic pain prompted imaging investigations, revealing a left ovarian mass suggestive of teratoma. Tumor markers including CA19-9, alpha-fetoprotein, and β -human chorionic gonadotropin were negative. Conservative surgery was performed, and histopathological examination confirmed mature cystic teratoma. Follow-up ANCA testing became negative after surgery. This case highlights that benign tumors may induce transient immunological abnormalities mimicking autoimmune disease. Positive ANCA results should always be interpreted according to clinical context and objective evidence of organ involvement.

Keywords: ANCA; Vasculitis; Mature teratoma; False positive autoantibodies; Ovarian tumor; Eosinophilia

1. Abbreviations

ANCA: Antineutrophil cytoplasmic antibodies; ELISA: Enzyme-linked immunosorbent assay; MRI: Magnetic resonance imaging; AFP: Alpha-fetoprotein; β -hCG: Beta-human chorionic gonadotropin; EGPA: Eosinophilic granulomatosis with polyangiitis

Citation: Mounsif S, Younes D, Moudatir M, et al. False-Positive ANCA in a Patient with Mature Ovarian Teratoma: A Case Report and Literature Review. Clin Case Rep Open Access. 2026;9(2):362.

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2. Introduction

Antineutrophil cytoplasmic antibodies are central biomarkers in the diagnostic approach of ANCA-associated vasculitides, especially granulomatosis with polyangiitis, microscopic polyangiitis, and eosinophilic granulomatosis with polyangiitis [1-3]. Their clinical utility is greatest when testing is performed in patients with suggestive manifestations such as glomerulonephritis, pulmonary hemorrhage, neuropathy, destructive ear-nose-throat disease, or multisystem inflammatory involvement [1,4].

However, ANCA positivity is not specific to vasculitis. False-positive or nonspecific ANCA may occur in chronic infections, inflammatory bowel disease, autoimmune diseases, drug exposure, and malignancies [5,6]. Misinterpretation may lead to unnecessary immunosuppressive therapy. We report an unusual case of transient ANCA positivity associated with benign ovarian mature cystic teratoma.

3. Case Presentation

A 39-year-old woman was admitted to the internal medicine department for evaluation of suspected ANCA-associated vasculitis. Her past medical history included allergy to salicylates and nonsteroidal anti-inflammatory drugs, depression treated with escitalopram 10 mg/day, and late-onset asthma under maintenance therapy. Previous biological investigations had shown persistent mild eosinophilia ranging from 1000 to 1500/mm³.

At admission, the patient was afebrile, hemodynamically stable, and had no respiratory distress. Physical examination was unremarkable.

Laboratory investigations revealed:

- Normal complete blood count without eosinophilia
- Preserved renal function
- Negative proteinuria
- No urinary sediment abnormalities

ANCA testing demonstrated x-ANCA positivity at low titer (1/10).

Detailed reassessment did not reveal constitutional syndrome, ENT manifestations, hemoptysis, pulmonary infiltrates, purpura, neuropathy, arthralgia, or renal manifestations suggestive of systemic vasculitis.

The only persistent complaint was chronic pelvic pain. Pelvic ultrasonography revealed a left ovarian mass. Complementary pelvic MRI suggested ovarian teratoma, although the benign nature could not be definitively confirmed radiologically. Tumor markers including CA19-9, AFP, and β -hCG were within normal limits.

The patient underwent conservative gynecological surgery. Histopathological examination confirmed mature cystic teratoma. Follow-up ANCA testing after surgery became negative.

4. Discussion and Literature Review

This observation highlights an important diagnostic challenge in internal medicine: the interpretation of isolated ANCA positivity in the absence of convincing clinical evidence of vasculitis. Antineutrophil cytoplasmic antibodies are major biomarkers for ANCA-associated vasculitides, particularly granulomatosis with polyangiitis, microscopic polyangiitis, and eosinophilic granulomatosis with polyangiitis. Nevertheless, international consensus recommendations stress that ANCA testing should only be requested in patients with an appropriate clinical context because indiscriminate testing significantly reduces specificity and increases false-positive results [1,4].

In the present case, several elements argued strongly against true systemic vasculitis. There was no renal involvement, normal kidney function, negative proteinuria, no urinary sediment abnormalities, and no pulmonary, ENT, neurological, or cutaneous manifestations. Moreover, ANCA positivity was weak (1/10) and became negative after tumor resection. These findings suggest a transient secondary immune phenomenon rather than primary autoimmune vasculitis.

5. False Positive ANCA: Current Evidence

False-positive ANCA results are increasingly recognized. They have been described in chronic infections, inflammatory bowel disease, autoimmune liver disease, connective tissue diseases, drug exposure, and neoplasia [5-8]. In many of these conditions, ANCA are directed against atypical neutrophil antigens rather than PR3 or MPO, limiting their diagnostic significance. Laboratory interference, especially antinuclear antibodies, may also produce misleading patterns and low-titer positivity [7-14].

Recent literature emphasizes the superiority of antigen-specific immunoassays (anti-PR3 and anti-MPO) over isolated indirect immunofluorescence in improving specificity. Therefore, positive ANCA results without compatible symptoms should always be confirmed and clinically reassessed.

6. Tumors and Autoimmune Serology

The association between tumors and autoantibody production is well established. Malignant and benign tumors may induce immune dysregulation through chronic inflammation, cytokine release, exposure of intracellular antigens, molecular mimicry, or polyclonal B-cell activation. Several solid tumors have been reported with ANCA positivity, occasionally mimicking systemic vasculitis clinically or biologically [8].

However, ANCA positivity associated with benign tumors remains uncommon and likely underrecognized. This makes the current case clinically noteworthy.

7. Mature Ovarian Teratoma: Literature Review

Mature cystic teratoma (dermoid cyst) is one of the most frequent benign ovarian tumors, accounting for approximately 10%-25% of all ovarian neoplasms and up to 60% of benign ovarian tumors in reproductive-age women [9,10]. It originates from totipotent germ cells and contains mature tissues derived from ectoderm, mesoderm, and endoderm [12].

Most mature teratomas are asymptomatic and incidentally discovered. When symptomatic, they may present with chronic pelvic pain, adnexal mass, ovarian torsion, rupture, compression symptoms, or rare malignant transformation [9,10].

Tumor markers are frequently normal, although CA19-9 may occasionally be elevated. Imaging by ultrasonography and MRI usually suggests the diagnosis, but histology remains definitive [12].

8. Teratoma and Immune Manifestations

Although generally benign, teratomas are known to induce immune-mediated syndromes. The best example is ovarian teratoma associated with autoimmune encephalitis, particularly anti-NMDA receptor encephalitis [11]. This demonstrates that benign ovarian teratomas may act as potent immunological triggers.

By analogy, transient ANCA production in our patient may reflect:

1. Exposure to ectopic antigenic tissues within the tumor
2. Local inflammatory microenvironment
3. Cytokine-mediated immune activation
4. Cross-reactive antibodies with neutrophil antigens
5. Polyclonal nonspecific B-cell stimulation

The disappearance of ANCA after surgery strongly supports a causal relationship.

9. Differential Diagnosis: Why EGPA Was Unlikely

Because the patient had late-onset asthma and previous eosinophilia, eosinophilic granulomatosis with polyangiitis was a relevant initial differential diagnosis. However, the updated 2022 ACR/EULAR criteria require a broader clinical pattern including neuropathy, nasal polyps, pulmonary infiltrates, biopsy eosinophilic inflammation, or vasculitis organ involvement [3]. In this case, eosinophilia was mild, fluctuating, absent at admission, and not associated with tissue disease. Previous classification approaches also emphasize multisystem involvement rather than isolated asthma and eosinophilia [13]. Thus, EGPA was not retained.

10. Practical Lessons for Internists

This case emphasizes several practical principles:

- ANCA positivity alone does not establish vasculitis
- Clinical probability must guide serological interpretation
- Weak or isolated ANCA positivity should prompt search for alternative causes
- Benign tumors may generate misleading immunological abnormalities
- Repeating serology after treatment of the suspected trigger may clarify causality
- Avoiding premature immunosuppression prevents unnecessary toxicity
- Current therapeutic recommendations for true ANCA-associated vasculitis involve potent immunosuppressive regimens, making diagnostic accuracy essential before treatment initiation [15].

11. Originality of the Case

To our knowledge, reports of transient ANCA positivity associated with mature ovarian teratoma are exceedingly rare. Most literature concerning teratomas focuses on surgical management, torsion, malignant degeneration, or autoimmune encephalitis. This observation broadens the spectrum of benign tumor-associated immune phenomena.

12. Conclusion

Benign ovarian mature cystic teratoma may rarely be associated with transient ANCA positivity and mimic systemic vasculitis. Positive ANCA results should always be interpreted according to pre-test clinical probability and objective evidence of organ involvement. Thorough reassessment may identify alternative diagnoses and prevent unnecessary immunosuppressive treatment.

13. Acknowledgement

The authors declare no specific funding.

14. Conflict of Interest

The authors declare no conflict of interest.

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