

1. DACH ANCA VASKULITIS FORUM 2023
12. & 13. MAI 2023

Einführung ANCA-Vasculitis - Update zur ANCA-assoziierten Vaskulitis (AAV)

Prof. Dr. Peter Villiger



AT-AVA-2300032
DE-AVA-2300045

CA VASKULITIS FORUM 2023

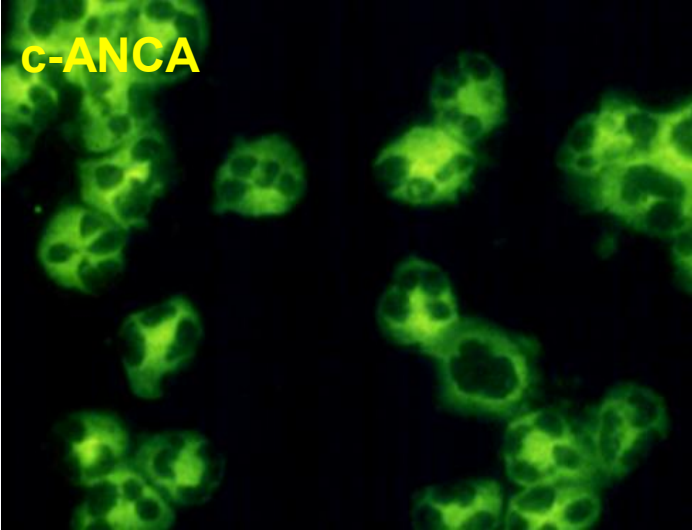
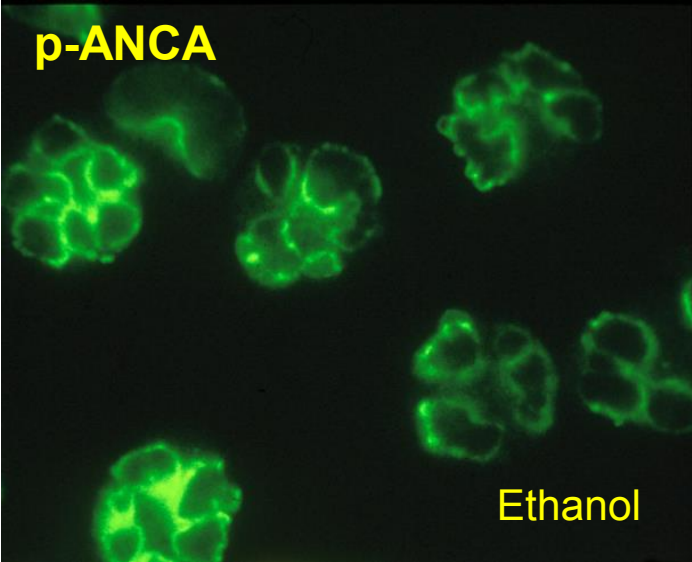
Einführung ANCA-Vasculitis

Prof. Peter M. Villiger
Rheumatology and Clinical Immunology
Medical Center Monbijou (MZM)
peter.villiger@hin.ch

Disclosures:

- Speaker, advisory fees and research support
 - Roche, MSD, Abbvie, Pfizer, Amgen, Chugai, BMS, GSK, Vifor, Astra-Zeneca

ANCA-assoziiert
Nekrotisierend
Pauci-immun

Fluoreszenz	Antigen	Assoziierte Krankheit
 c-ANCA	Proteinase 3 (PR3)	GPA Cave: Infekt Medikamente
 p-ANCA Ethanol	Myeloperoxidase (MPO) Andere Antigene: Elastase, Lactoferrin	MPA eGPA RA SLE IBD

nekrotisierend

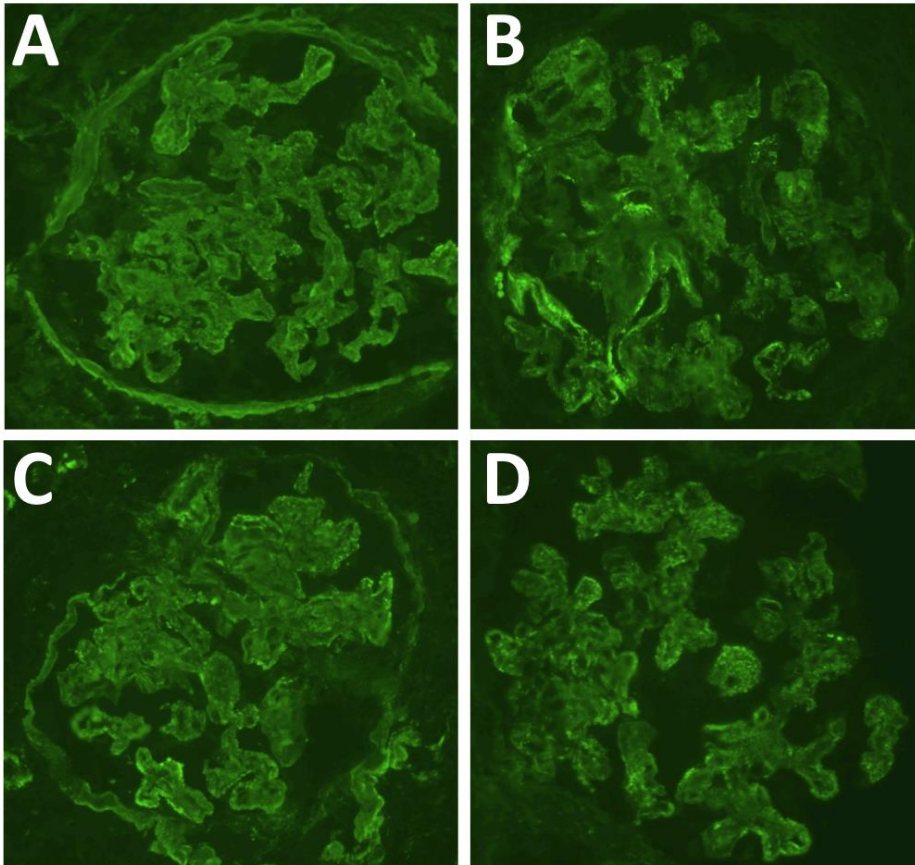


M L 1972

Pauci-immun

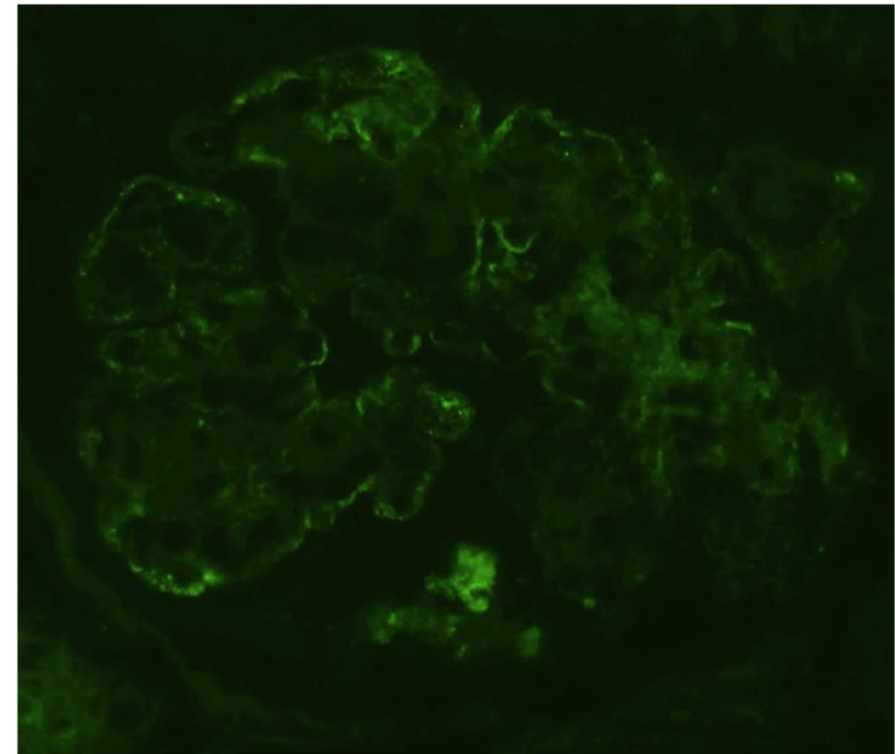
Lupus-Nephritis-Full-House

Immunfluoreszenz eines Glomerulums, “full house”
Bild mit Deposition von IgG (A), IgA (B) Komplement C5b-9 (C) und C3 (D) (als hellgrüne Ablagerungen erkennbar)



ANCA-Pauciimmun-GN

Immunfluoreszenz eines Glomerulums, kaum Depots (hellgrün) erkennbar



Engramme aus dem Alltag



- 64 jähriger Mann
- Seit 10 Tagen kalte Akren
- Schmerzen

Anamnese: bland?
Strukturell – funktionell,
Welcher Gefässtyp?

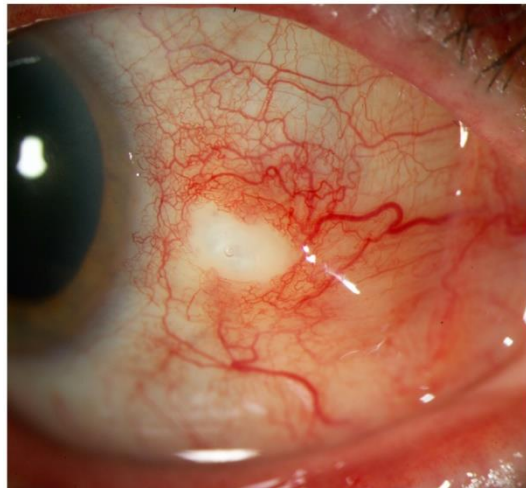


Gefässe

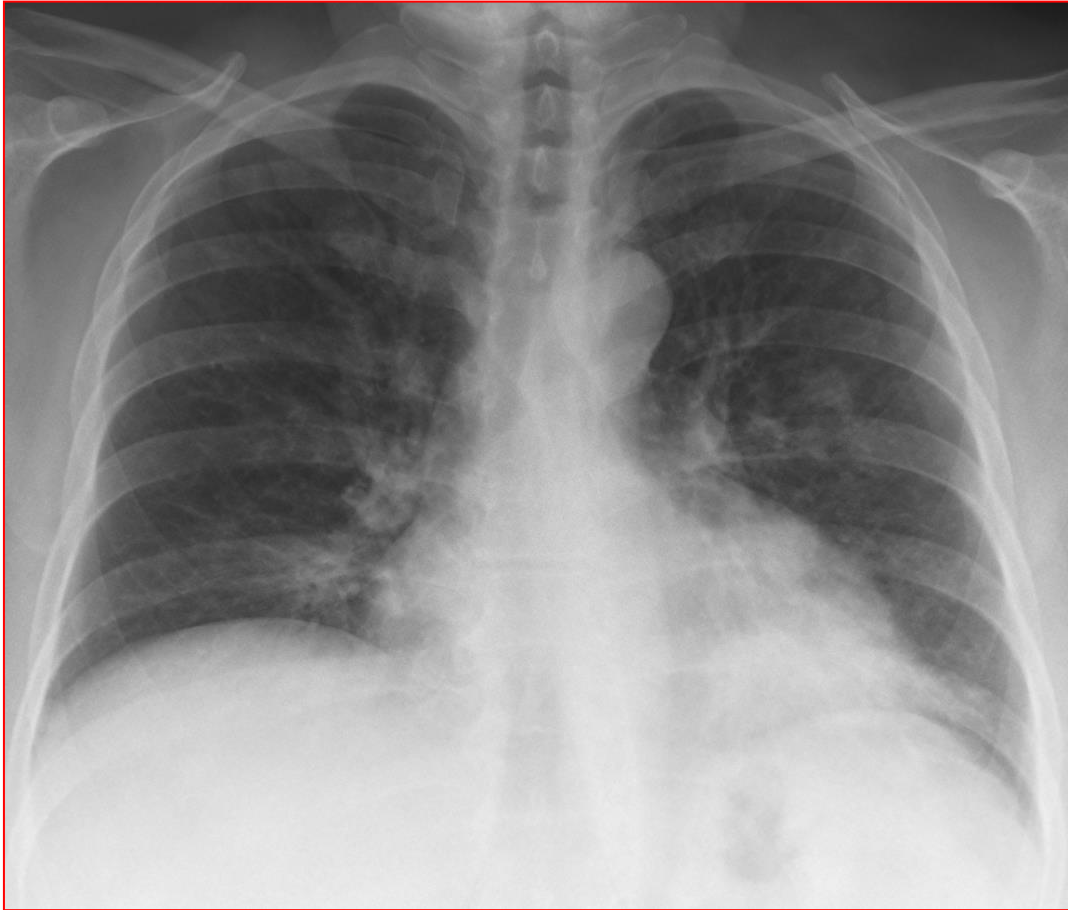




Auge: noduläre Skleritis



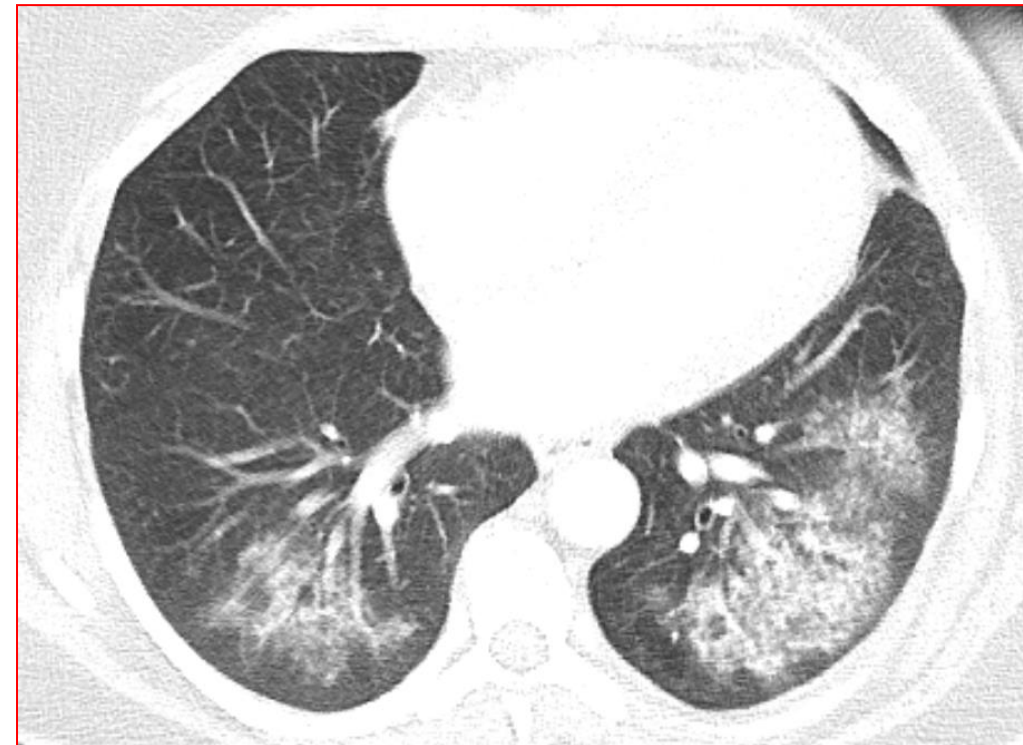
Klinische Angaben: Husten mit leichtem Auswurf,
Rasselgeräusche basal beidseits. Infiltrate?



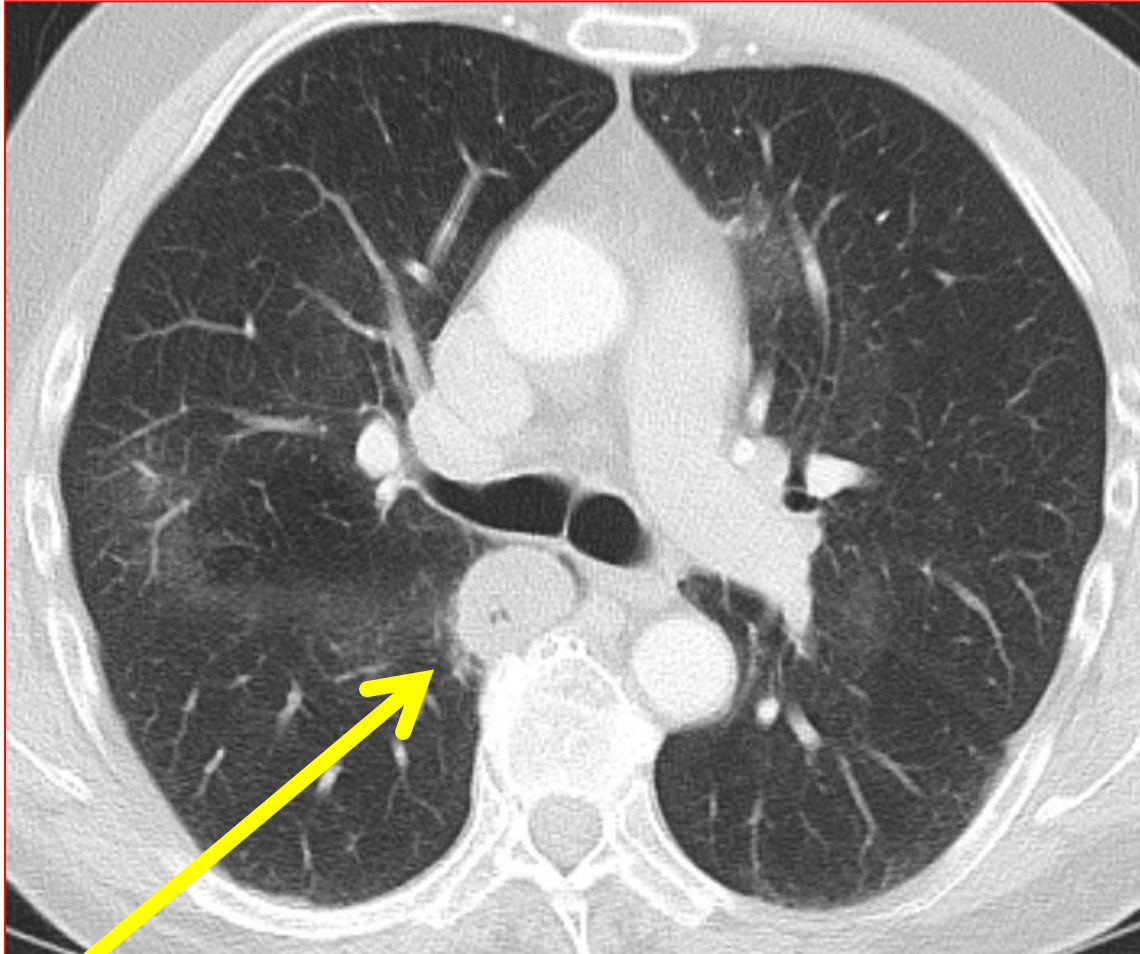
- Normozytäre normochrome Anämie
- ANCA
- CRP
- Urinstatus

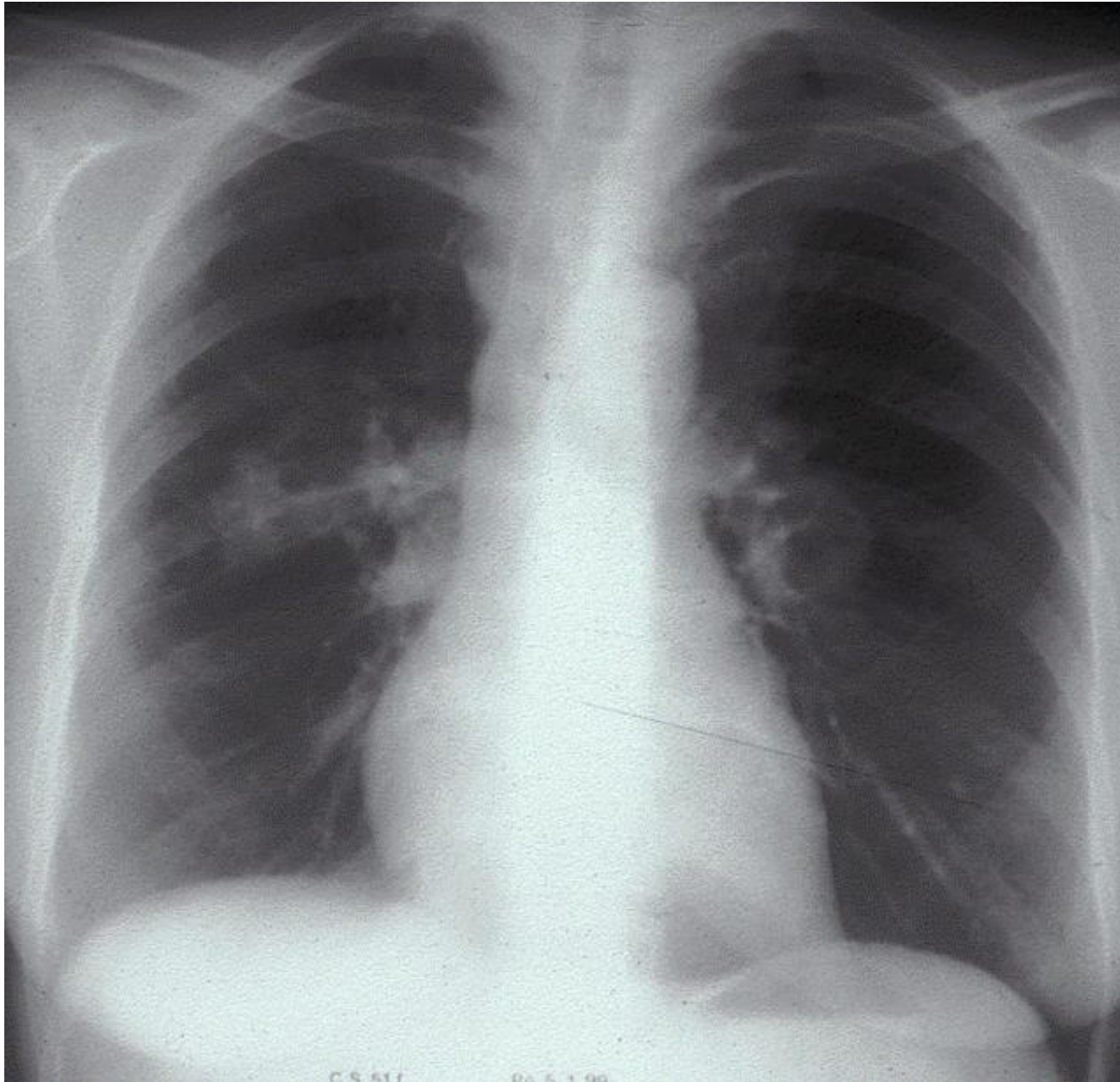
Lunge

Azinäre und ground glass Infiltrate im
dorsobasalen Unterlappen beidseits bei
Lungenblutung im Rahmen einer ANCA-
assoziierten Kleingefässvaskulitis



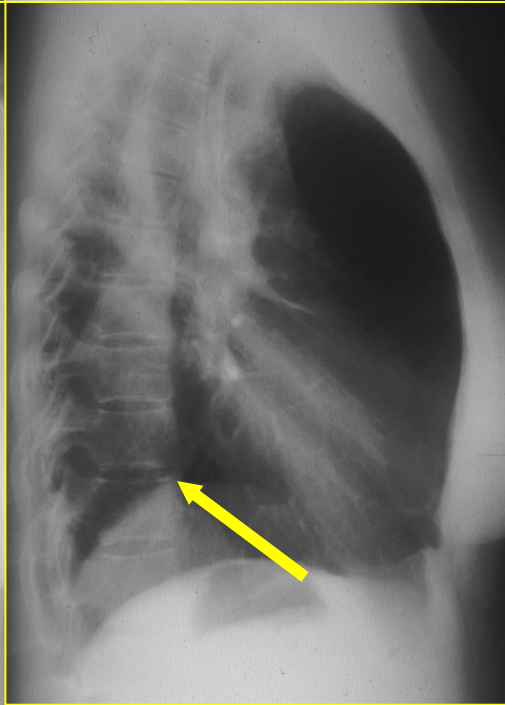
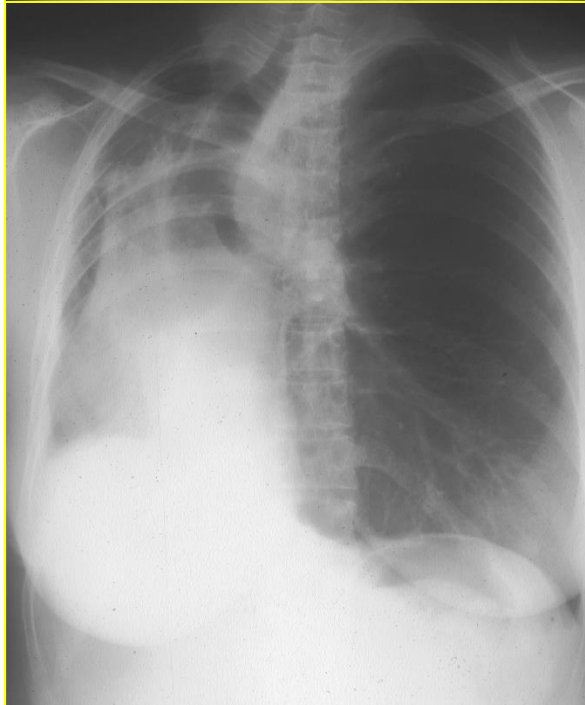
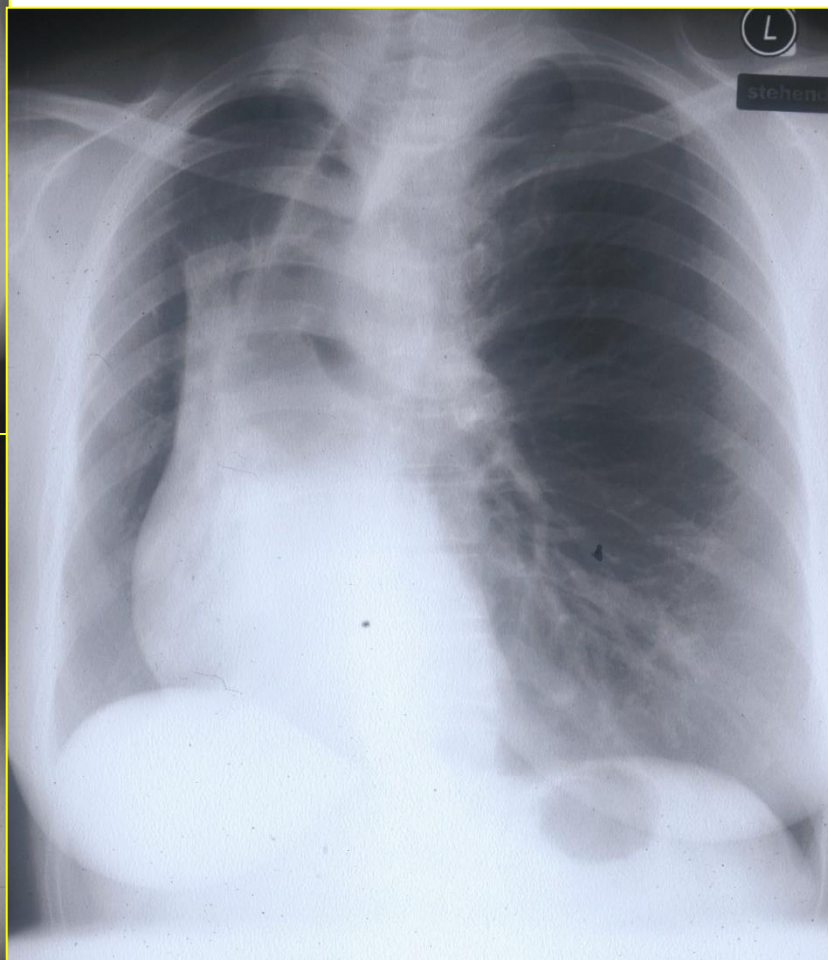
Granulomatosis



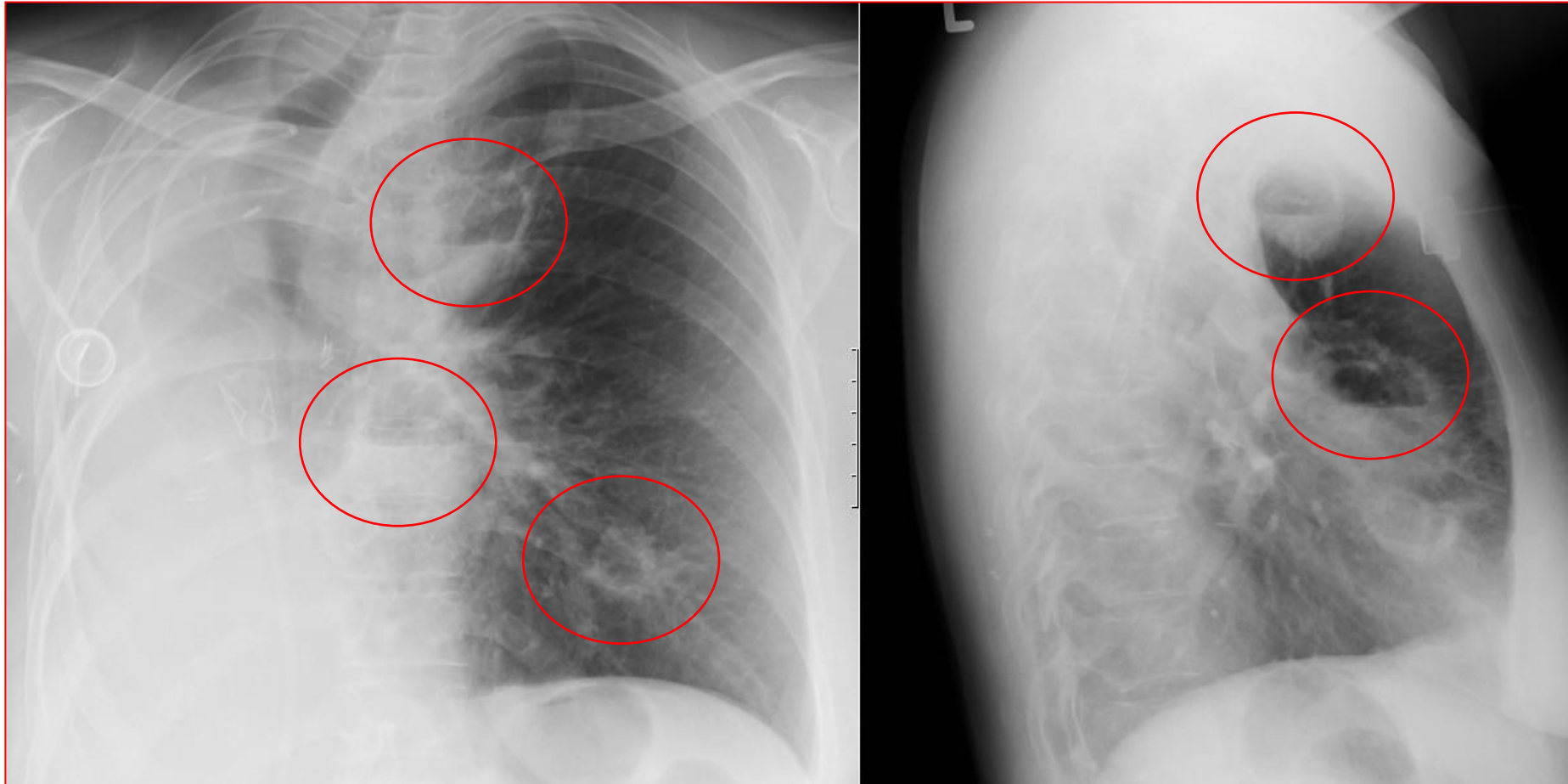


ANCA negativ
Granulomatose

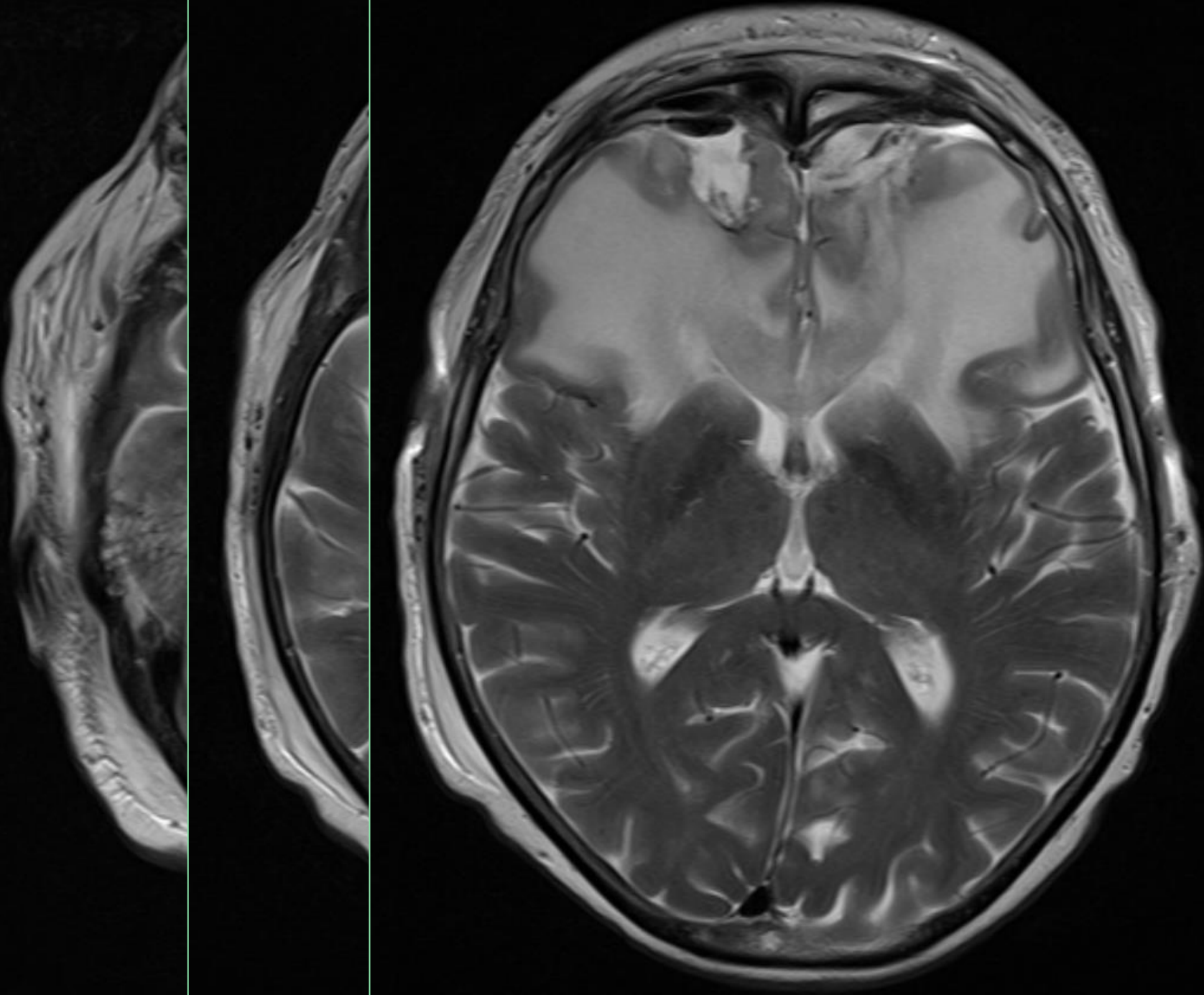
Januar 1999



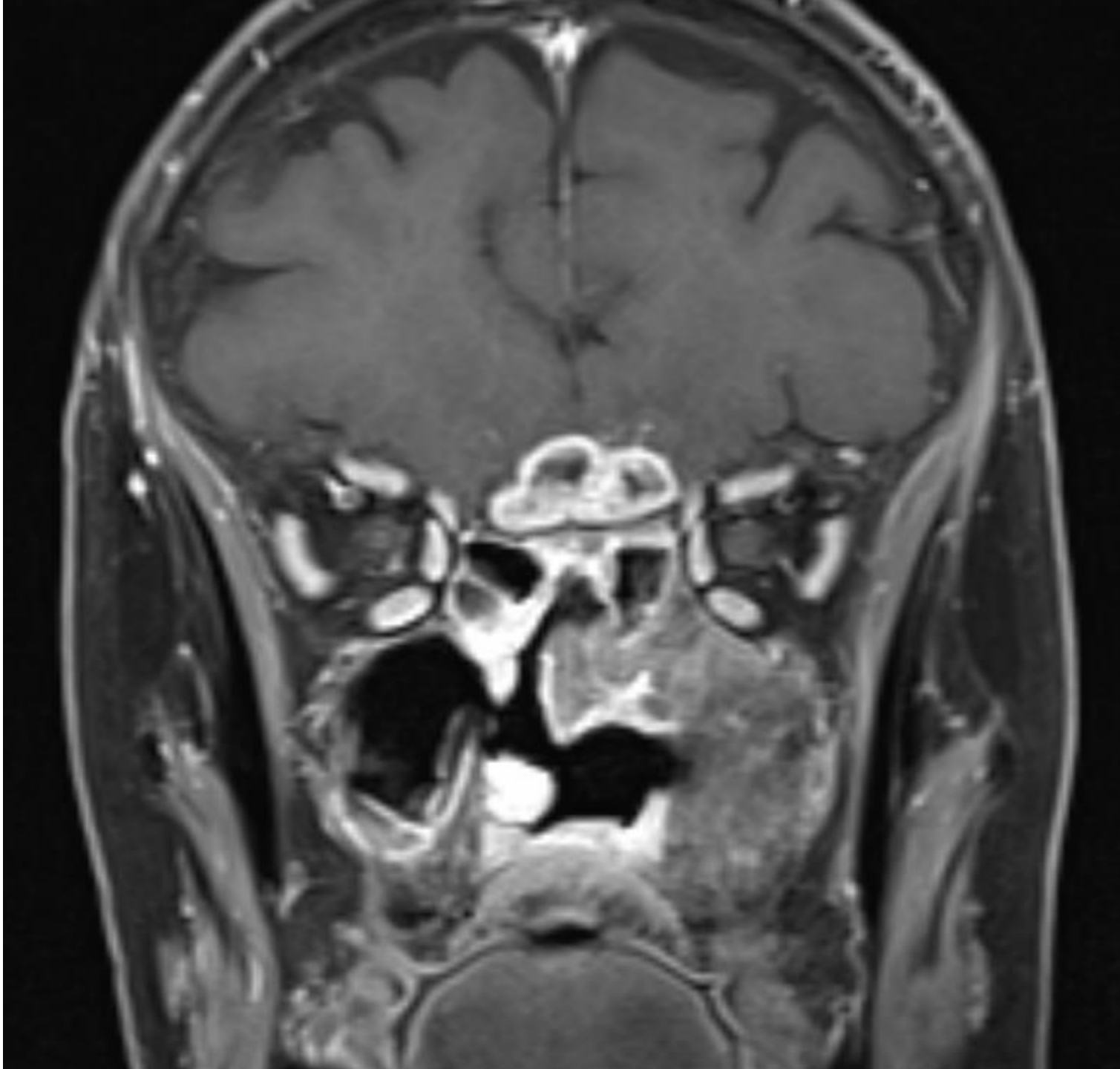
11/2008



C:



- + 1(3)
24



Histology of eGPA

- 3 types of lesions:
 - Necrotizing vasculitis
 - Tissue infiltration by eosinophils
 - Extravascular granulomas

❖ **Diagnosis**

- 4 categories of lung histology:

- | | |
|--|-------------------|
| • Eos, necrotizing vasculitis, granuloma | ❖ Yes |
| • Eos, necrotizing vasculitis | ❖ Likely |
| • Eos + necrosis of other organ tissues | ❖ Possible |
| • Pulmonary eos only | ❖ No value |

Nervensystem

Neurapraxie – Axonotmesis - Neurotomie

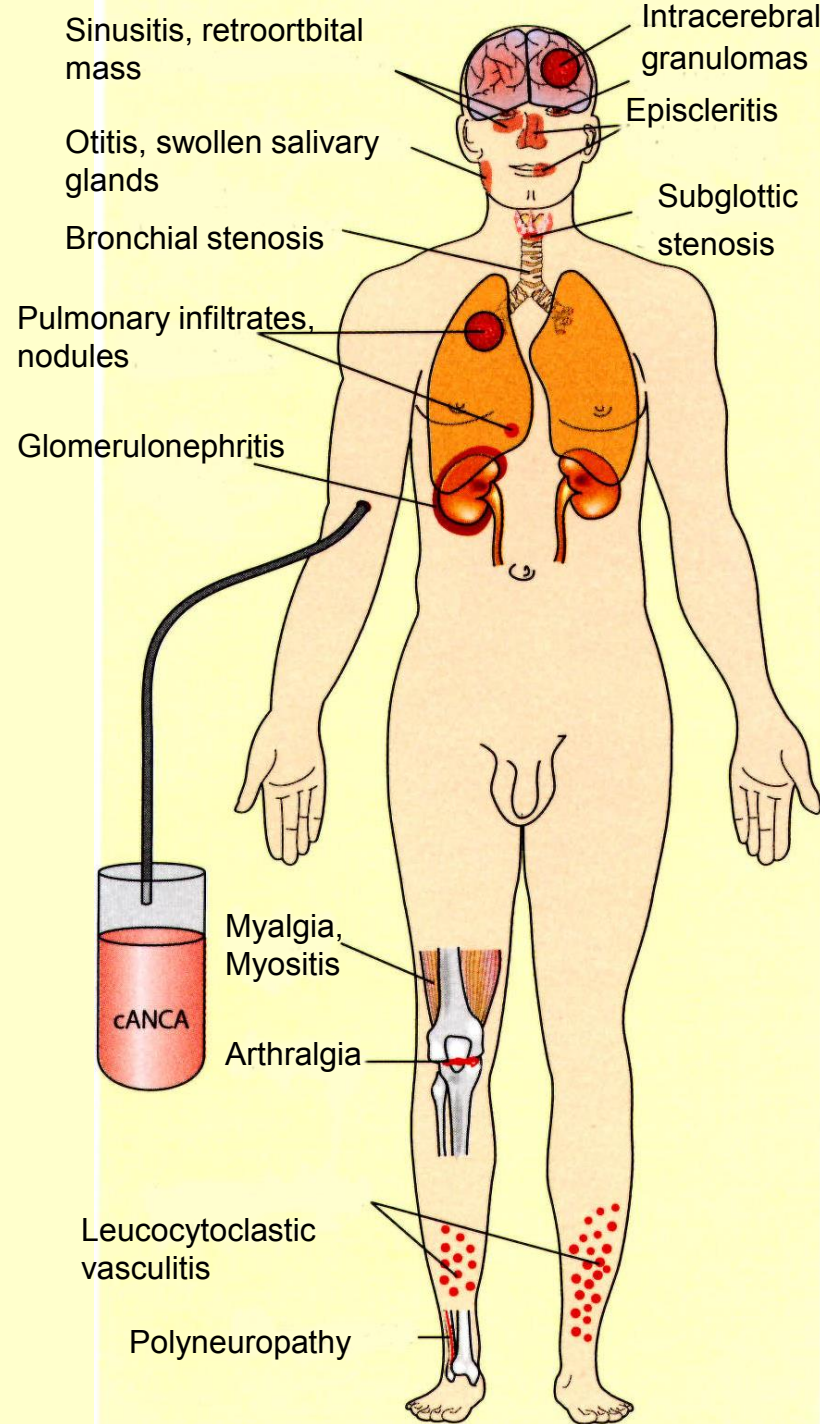
Fragen

- a. Axonal
- b. Demyelinisierend

- a. Chronisch progredient
- b. Plötzlich

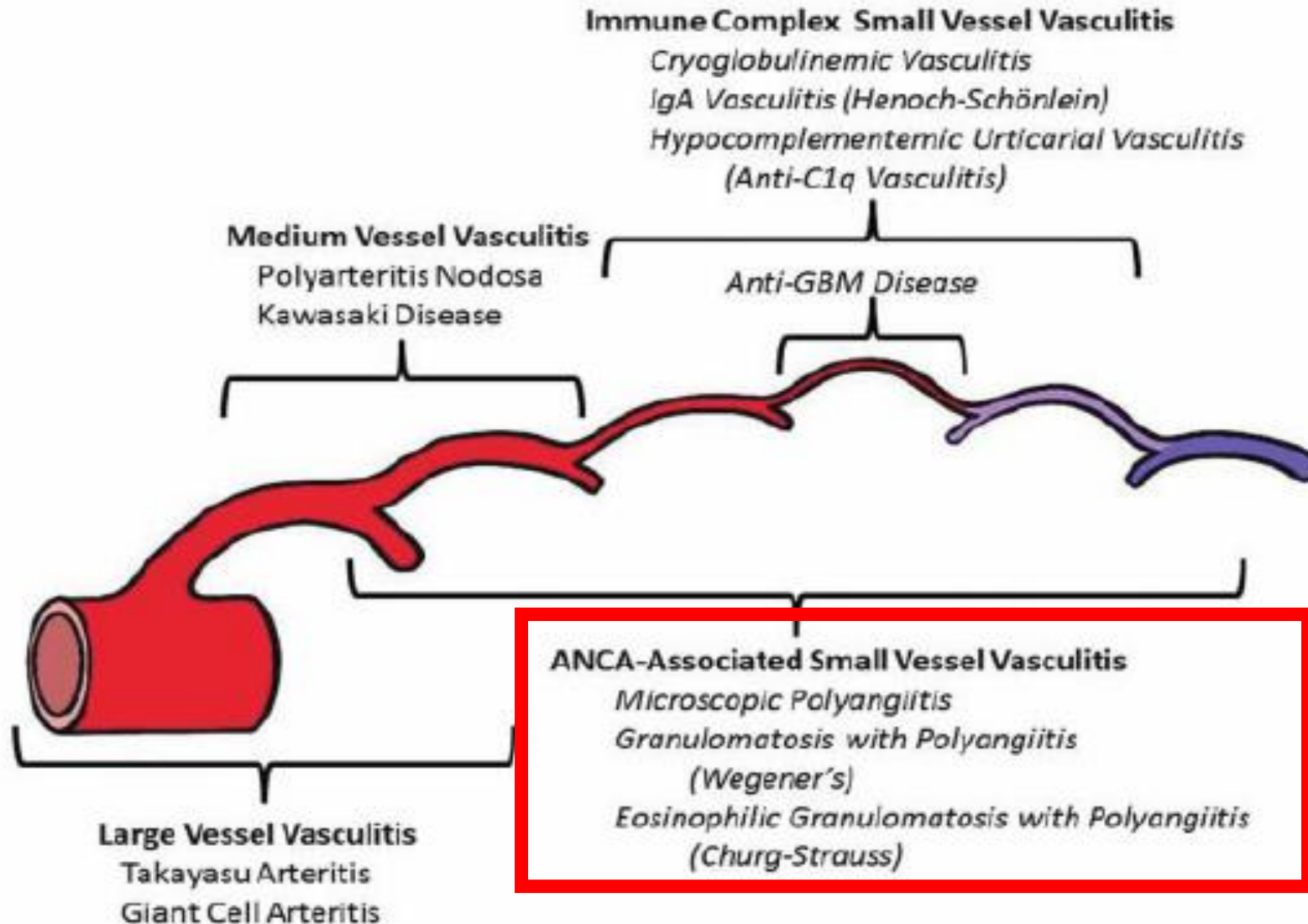
- a. Definitiver Schaden
- b. Funktionelle Erholung





- Lungen
- Nieren
- Nervensystem
- Muskeln, Gelenke
- Haut

The big 5: GPA, MPA, eGPA, RA, Infekt



+ RA-Vaskulitis
+ Infektvaskulitis

Fazit

- Multiorganbefall
 - Mehrere Spezialitäten / Netzwerk
- Dynamik
 - Fast-track-Clinics / Netzwerk
- Schleichende Verschlechterung
 - Granulomatose: langsames invasiv-destruktives Wachstum
- Klinische Untersuchung
- «patient education»
 - Urinkontrollen / Blutdruck / Kenntnis über Notfallsituationen

Liste der Referenzen

- Aqeel F, et al. Immune checkpoint inhibitors as potential triggers for ANCA vasculitis. *RMD Open* 2022;8:e002500.
- Banik P et al. Outcomes of Methotrexate as an Initial Induction and Maintenance Regimen for Localized Granulomatosis with Polyangiitis: A Retrospective Review. *Arthritis Rheumatol* 2022;74(suppl 9):Abstract #1082-ACR Convergence 2022
- Benichou N, et al. Proteinuria and hematuria after remission induction are associated with outcome in ANCA-associated vasculitis. *Kidney Int* 2023. Epub ahead of print: doi: 10.1016/j.kint.2023.02.029.
- Berden AE, et al. Histopathologic Classification of ANCA-Associated Glomerulonephritis. *JASN* 2010;21(10):1628-1636.
- Berti A, et al. Autoreactive Plasmablasts After B Cell Depletion With Rituximab and Relapses in Antineutrophil Cytoplasmic Antibody-Associated Vasculitis. *Arthritis Rheum* 2023;75(5):736-747.
- Bossuyt X, et al. Position paper: Revised 2017 international consensus on testing of ANCAs in granulomatosis with polyangiitis and microscopic polyangiitis. *Nat Rev Rheumatol* 2017;13(11):683-692.
- Bramlage CP, et al. Management of cardiovascular risk factors in patients with ANCA-associated vasculitis. *J Eval Clin Pract* 2017;23:747-754.
- Brix SR, et al. Development and validation of a renal risk score in ANCA-associated glomerulonephritis. *Kidney Int* 2018;94(6):1177-1188.
- Charles P, et al. Comparison of individually tailored versus fixed-schedule rituximab regimen to maintain ANCA-associated vasculitis remission: results of a multicentre, randomised controlled, phase III trial (MAINRITSAN2). *Ann Rheum Dis* 2018;77:1443-1449.
- Charles P, et al. Long-Term Rituximab Use to Maintain Remission of Antineutrophil Cytoplasmic Antibody-Associated Vasculitis. *Ann Intern Med* 2020;173(3):179-187.
- Cohen Tervaert JW, et al. Prevention of relapses in Wegener's granulomatosis by treatment based on antineutrophil cytoplasmic antibody titre. *Lancet* 1990;336:709-711.
- Conrad N, et al. Autoimmune diseases and cardiovascular risk: a population-based study on 19 autoimmune diseases and 12 cardiovascular diseases in 22 million individuals in the UK. *Lancet* 2022;400:733-743.
- Corral-Gudino L, et al. Overall survival, renal survival and relapse in patients with microscopic polyangiitis: a systematic review of current evidence. *Rheumatology (Oxford)* 2011;50(8):1414-1423.
- Cortazar FB, et al. Renal Recovery for Patients with ANCA-Associated Vasculitis and Low estimated GFR in the ADVOCATE Trial of Avacopan. *Kidney Internat Reports* 2023;8:860-870.
- de Groot K, et al. Pulse versus daily oral cyclophosphamide for induction of remission in antineutrophil cytoplasmic antibody-associated vasculitis: a randomized trial. *Ann Intern Med* 2009;150:670-680.
- de Groot K, et al. Randomized trial of cyclophosphamide versus methotrexate for induction remission in early systemic antineutrophil cytoplasmic antibody-associated vasculitis. *Arthritis Rheum* 2005;52(8):2461-2469.
- de Joode AAE, et al. Renal Survival in Proteinase 3 and Myeloperoxidase ANCA-Associated Systemic Vasculitis. *Clin J Am Soc Nephrol* 2013;8(10):1709-1717.
- Delestre F, et al. Rituximab as Maintenance Therapy for ANCA-associated Vasculitides: Pooled Analysis and Long-term Outcome of MAINRITSAN Trials. *Arthritis Rheumatol* 2022;74(suppl 9):Abstract 0527-ACR Convergence 2022
- Dendooven A, et al. Coding practice in national and regional kidney biopsy registries. *BMC Nephrol* 2021;22:193.
- Diebold M, et al. Incidence of new onset glomerulonephritis after SARS-CoV-2 mRNA vaccination is not increased. *Kidney Int.* 2022;102(6):1409-1419.
- Drosos GC, et al. EULAR recommendations for cardiovascular risk management in rheumatic and musculoskeletal diseases, including systemic lupus erythematosus and antiphospholipid syndrome. *Ann Rheum Dis* 2022;81:768-779.
- Egan AC, et al. The Sound of Interconnectivity; The European Vasculitis Society 2022 Report. *Kidney Int Rep* 2022;7(8):1745-1757.
- Enghard P, et al. Imlifidase as novel treatment strategy in anti-neutrophil cytoplasmic antibody-induced pulmonary-renal syndrome. *Kidney Int.* 2021;100(6):1344-1345.
- Flossmann O, et al. Long-term patient survival in ANCA-associated vasculitis. *Ann Rheum Dis* 2011;70(3):488-494.
- Floyd L, et al. Cardiovascular disease and ANCA-associated vasculitis: are we missing a beat? *Clin Kidney J* 2022;15(4):618-623.
- Floyd L, et al. Glucocorticoid Therapy in ANCA Vasculitis: Using the Glucocorticoid Toxicity Index as an Outcome Measure. *Kidney360* 2021;2(6):1002-1010.
- Furuta S, et al. Effect of Reduced-Dose vs High-Dose Glucocorticoids Added to Rituximab on Remission Induction in ANCA-Associated Vasculitis: A Randomized Clinical Trial. *JAMA* 2021;325(21):2178-2187.
- Gabilan C, et al. Avacopan as First-Line Treatment in Antineutrophil Cytoplasmic Antibody-Associated Vasculitis: A Steroid-Sparing Option. *Kidney Int Rep* 2022;7(5):1115-1118.
- Gamerith G, et al. Association of baseline soluble immune checkpoints with the risk of relapse in PR3-ANCA vasculitis following induction of remission. *Ann Rheum Dis* 2023;82:253-261.
- Geetha D, et al. Rituximab versus cyclophosphamide for ANCA-associated vasculitis with renal involvement. *J Am Soc Nephrol* 2015;26(4):976-985.
- Gercik O, et al. Histopathological subgrouping versus renal risk score for the prediction of end-stage renal disease in ANCA-associated vasculitis. *Ann Rheum Dis* 2020 May;79(5):675-676.
- Grayson PC, et al. 2022 American College of Rheumatology/European Alliance of Associations for Rheumatology Classification Criteria for Eosinophilic Granulomatosis with Polyangiitis. *Ann Rheum Dis* 2022;81(3):309-314.
- Guillevin L, et al. Rituximab versus azathioprine for maintenance in ANCA-associated vasculitis. *N Engl J Med* 2014;371:1771-1780.
- Hakroush S, B. Tampe. Tailored Use of Avacopan in a Case With Refractory Antineutrophil Cytoplasmic Antibody-Associated Renal Vasculitis and Concomitant Complement System Activation. *Kidney Int Rep* 2022;8(2):376-378.
- Hakroush S, et al. Bowman's capsule rupture links glomerular damage to tubulointerstitial inflammation in ANCA-associated glomerulonephritis. *Clin Exp Rheumatol* 2021;39 Suppl 129(2):27-31.
- Hakroush S, et al. Histopathological Findings Predict Renal Recovery in Severe ANCA-Associated Vasculitis Requiring Intensive Care Treatment. *Front Med* 2022;7:622028.
- Hakroush S, et al. Intrarenal synthesis of complement C3 localized to distinct vascular compartments in ANCA-associated renal vasculitis. *J Autoimmun* 2022;133:102924.
- Hakroush S, Tampe B. Association between Loss of Immune Checkpoint Programmed Cell Death Protein 1 and Active ANCA-Associated Renal Vasculitis. *Int J Mol Sci* 2023;24(3):2975.
- Hakroush S, Tampe B. Correspondence on 'Bowman's capsule rupture on renal biopsy improves the outcome prediction of ANCA-associated glomerulonephritis classifications'. *Ann Rheum Dis* 2019:<http://dx.doi.org/10.1136/annrheumdis-2021-219970>.

Liste der Referenzen

- Hellmich B, et al. EULAR recommendations for conducting clinical studies and/or clinical trials in systemic vasculitis: focus on anti-neutrophil cytoplasm antibody-associated vasculitis. *Ann Rheum Dis* 2007;66(5):605–617.
- Hellmich B, et al. EULAR recommendations for the management of ANCA-associated vasculitis: 2022 update. *Ann Rheum Dis* 2023;0:1–18. Epub ahead of print: doi:10.1136/ard-2022-223764
- Holle JU, et al. Improved outcome in 445 patients with Wegener's granulomatosis in a German vasculitis center over four decades. *Arthritis Rheum* 2011;63(1):257–266
- Iking-Konert C, et al. The Joint Vasculitis Registry in German-speaking countries (GeVas) - a prospective, multicenter registry for the follow-up of long-term outcomes in vasculitis. *BMC Rheumatol* 2021;5(1):40.
- Jayne D, et al. A randomized trial of maintenance therapy for vasculitis associated with antineutrophil cytoplasmic autoantibodies. *N Engl J Med* 2003;349:36–44.
- Jayne D, et al. Avacopan for the Treatment of ANCA-Associated Vasculitis. *N Engl J Med* 2021;384(7):599–609.
- Jayne D, et al. Randomized Trial of C5a Receptor Inhibitor Avacopan in ANCA-Associated Vasculitis. *J Am. Soc Nephrol* 2017;28(9):2756–2767.
- Jayne DR, et al. Randomized trial of plasma exchange or high-dosage methylprednisolone as adjunctive therapy for severe renal vasculitis. *J Am Soc Nephrol* 2007;18:2180–2188.
- Jennette JC, et al. 2012 revised International Chapel Hill Consensus Conference Nomenclature of Vasculitides. *Arthritis Rheum* 2013;65(1):1–11.
- Jones R, et al. Mycophenolate mofetil versus cyclophosphamide for remission induction in ANCA-associated vasculitis: a randomised, non-inferiority trial. *Ann Rheum Dis* 2019;78:399–405.
- Jones RB, et al. ituximab versus cyclophosphamide in ANCA-associated renal vasculitis: 2-year results of a randomised trial. *Ann Rheum Dis* 2015;74:1178–1182.
- Karras A, et al. Randomised controlled trial of prolonged treatment in the remission phase of ANCA-associated vasculitis. *Ann Rheum Dis* 2017;76(10):1662–1668.
- Kauffmann M, et al. Disease Activity and Adverse Events in Patients with ANCA-Associated Vasculitides Undergoing Long-Term Dialysis. *Clin J Am Soc Nephrol* 2021;16(11):1665–1675.
- KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney Int Suppl* 2013;3(1).
- KDIGO 2023 Clinical Practice Guideline for the Management of Antineutrophil Cytoplasmic antibody (ANCA)-Associated Vasculitis. Public Review Draft May 2023:https://kdigo.org/kdigo-2023-anca-guideline-update-available-for-public-review/
- Kitching A, et al. ANCA-associated vasculitis. *Nat Rev Dis Primers* 2020;6(1):71.
- Kronbichler A, et al. Classification criteria for ANCA-associated vasculitis: one size does not fit all! *Rheumatology* 2023;62(3):993–995.
- Kronbichler A, et al. Clinical associations of renal involvement in ANCA-associated vasculitis. *Autoimmun Rev* 2020;19(4):102495.
- Kronbichler A, et al. The Association of Pulmonary Haemorrhage, Positive PR3-ANCA and Urinary Red Blood Cell Casts with Venous Thromboembolism in ANCA-Associated Vasculitis. *Arthritis Rheumatol* 2019;71:1888–1893.
- Kronbichler A, et al. Trimethoprim-sulfamethoxazole prophylaxis prevents severe/life-threatening infections following rituximab in antineutrophil cytoplasm antibody-associated vasculitis. *Ann Rheum Dis* 2018;77(10):1440–1447.
- Lee T, et al. Predictors of treatment outcomes in ANCA-associated vasculitis with severe kidney failure. *Clin J Am Soc Nephrol* 2014;9(5):905–913.
- Leeuwen J, et al. Biologics: Preliminary Assessment of Safety and Tolerability of Avacopan During the Early Access Program for ANCA-Associated Vasculitis. *Targets and Therapy* 2023;17:11–14.
- Leeuwen J, et al. Compassionate Use of Avacopan in Difficult-to-Treat Antineutrophil Cytoplasmic Antibody-Associated Vasculitis. *Kidney Int Rep* 2021;7(3):624–628.
- L'Imperio V, et al. Bowman's capsule rupture on renal biopsy improves the outcome prediction of ANCA-associated glomerulonephritis classifications. *Ann Rheum Dis* 2020:http://dx.doi.org/10.1136/annrheumdis-2020-217979.
- Lyons PA, et al. Genetically distinct subsets within ANCA-associated vasculitis. *N Engl J Med* 2012;367(3):214–223.
- Lyons PA, et al. Genome-wide association study of eosinophilic granulomatosis with polyangiitis reveals genomic loci stratified by ANCA status. *Nat Commun* 2019;10(1):5120.
- Mahr A, et al. Subclassifying ANCA-associated vasculitis: a unifying view of disease spectrum. *Rheumatology* 2019;58(10):1707–1709.
- Mansfield N, et al. Prolonged disease-free remission following rituximab and low-dose cyclophosphamide therapy for renal ANCA-associated vasculitis. *Nephrol Dial Transplant* 2011;26(10):3280–3286.
- McClure M. B cell therapy in ANCA-associated vasculitis. *Apollo* 2022:https://doi.org/10.17863/CAM.86210
- McClure ME, et al. Evaluation of PR3-ANCA Status After Rituximab for ANCA-Associated Vasculitis. *J Clin Rheumatol* 2019;25(5):217–223.
- McGlenn K, et al. FAIRVASC: A semantic web approach to rare disease registry integration. *Comput Biol Med* 2022;145:105313.
- McKinney EF, et al. T-cell exhaustion, co-stimulation and clinical outcome in autoimmunity and infection. *Nature* 2015;523(7562):612–616.
- Mebrahtu TF, et al. Oral glucocorticoids and incidence of hypertension in people with chronic inflammatory diseases: a population-based cohort study. *CMAJ* 2020;192(12):e295–E301.
- Merkel P, et al. Adjunctive Treatment With Avacopan, an Oral C5a Receptor Inhibitor, in Patients With Antineutrophil Cytoplasmic Antibody-Associated Vasculitis. *ACR Open Rheumatology* 2020;2(11):662–671.
- Miloslavsky E, et al. Development of a Glucocorticoid Toxicity Index (GTI) using multicriteria decision analysis. *Ann Rheum Dis* 2017;76(3): 543–546.
- Moiseev S, et al. Association of venous thromboembolic events with skin, pulmonary and kidney involvement in ANCA-associated vasculitis: a multinational study. *Rheumatology* 2021;60:4654–4661.
- Moiseev S, et al. Traditional and Disease Specific Risk Factors for Cardiovascular Events in ANCA-Associated Vasculitis: A Multinational Retrospective Study. *J Rheumatol* 2023; online ahead of print.
- Moltó A, et al. Comorbidity indices. *Clin Exp Rheumatol* 2014;32(5 Suppl 85):S-131–4.
- Moran SM, et al. The Clinical Application of Urine Soluble CD163 in ANCA-Associated Vasculitis. *J Am Soc Nephrol* 2021;32(11):2920–2932.
- Moran SM, et al. Urinary soluble CD163 and monocyte chemoattractant protein-1 in the identification of subtle renal flare in anti-neutrophil cytoplasmic antibody-associated vasculitis. *NDT* 2020;35(2):283–291.
- Morris AD, et al. Biomarkers in ANCA-Associated Vasculitis: Potential Pitfalls and Future Prospects. *Kidney360* 2021;2(3):586–597.

Liste der Referenzen

- Moura MC, et al. Management of anti-neutrophil cytoplasmic antibody associated vasculitis with glomerulonephritis as proposed by the ACR 2021, EULAR 2022 and KDIGO 2021 Guidelines/Recommendations. *Nephrol Dial Transplant* 2023;gfa090. <https://doi.org/10.1093/ndt/gfa090>
- Mukhtyar C, et al. EULAR recommendations for the management of primary small and medium vessel vasculitis. *Ann Rheum Dis*. 2008;68:310-317.
- Ocon AJ, et al. Short-term dose and duration-dependent glucocorticoid risk for cardiovascular events in glucocorticoid-naïve patients with rheumatoid arthritis. *Ann Rheum Dis* 2021;80(12):1522-1529.
- Odler B, et al. Challenges of defining renal response in ANCA-associated vasculitis: call to action? *Clin Kidney J* 2023;sfad009. <https://doi.org/10.1093/ckj/sfad009>.
- Odler B, et al. Risk factors for serious infections in ANCA-associated vasculitis. *Ann Rheum Dis* 2023;82(5):681-687.
- O'Reilly VP, et al. Urinary Soluble CD163 in Active Renal Vasculitis. *J Am Soc Nephrol* 2016;27(9):2906-2916.
- Ostendorf L, et al. Daratumumab for the treatment of refractory ANCA-associated vasculitis. *RMD open* 2023;9(1):e002742.
- Patel N, et al. Glucocorticoid Toxicity Index scores by domain in patients with antineutrophil cytoplasmic antibody-associated vasculitis treated with avacopan versus standard prednisone taper: post-hoc analysis of data from the ADVOCATE trial. *Lancet Rheumatol* 2023;5:e130-38.
- Person A, et al. In situ Visualization of C3/C5 Convertases to Differentiate Complement Activation. *Kidney Int Rep* 2022;5(6):927-930.
- Pyo JY, et al. Reclassification of previously diagnosed GPA patients using the 2022 ACR/EULAR classification criteria. *Rheumatology* 2023;62(3):1179-1186.
- Robson J, et al. Glucocorticoid treatment and damage in the anti-neutrophil cytoplasm antibody-associated vasculitides: long-term data from the European Vasculitis Study Group trials. *Rheumatology* 2015;54(3):471-481.
- Robson JC, et al. 2022 American College of Rheumatology/European Alliance of Associations for Rheumatology Classification Criteria for Granulomatosis With Polyangiitis. *Arthritis Rheumatol* 2022;74(3):393-399.
- Rovin BH, et al. Executive summary of the KDIGO 2021 Guideline for the Management of Glomerular Diseases. *Kidney Int* 2021;100(4):753-779.
- Sarica SH, et al. Multimorbidity in Antineutrophil Cytoplasmic Antibody-Associated Vasculitis: Results From a Longitudinal, Multicenter Data Linkage Study. *Arthritis Rheumatol* 2021;73(4):651-659.
- Scurt FG, et al. ANCA-assozierte Vaskulitis - Komplementfaktor C3 bestimmt den Krankheitsverlauf. *DGIM 2023: Poster PS081*.
- Smith R, et al. Rituximab versus azathioprine for maintenance of remission for patients with ANCA-associated vasculitis and relapsing disease: an international randomised controlled trial. *Ann Rheum Dis* 2023;ard-2022-223559. Epub ahead of print. doi:10.1136/ard-2022-223559.
- Smith RM, et al. Rituximab as therapy to induce remission after relapse in ANCA-associated vasculitis. *Ann Rheum Dis* 2020;79(9):1243-1249.
- Solans-Laqué R, et al. Clinical characteristics and outcome of Spanish patients with ANCA-associated vasculitides: Impact of the vasculitis type, ANCA specificity, and treatment on mortality and morbidity. *Medicine (Baltimore)* 2017;96(8):e6083.
- Stassen PM, et al. Induction of remission in active anti-neutrophil cytoplasmic antibody-associated vasculitis with mycophenolate mofetil in patients who cannot be treated with cyclophosphamide. *Ann Rheum Dis* 2007;66(6):798-802.
- Stone JH, et al. Rituximab versus Cyclophosphamide for ANCA-Associated Vasculitis. *N Engl J Med* 2010;363(3):221-232.
- Suppiah R, et al. 2022 American College of Rheumatology/European Alliance of Associations for Rheumatology classification criteria for microscopic polyangiitis. *Ann Rheum Dis* 2022;81(3):321-326.
- Suppiah R, et al. A model to predict cardiovascular events in patients with newly diagnosed Wegener's granulomatosis and microscopic polyangiitis. *Arthritis Care Res* 2011; 63:588-596.
- Takala JH, et al. Wegener's granulomatosis in Finland in 1981-2000: risk of dialysis-dependent renal disease. *Scand J Rheumatol* 2011;40(4):283-288.
- Tam FWK, et al. Urinary monocyte chemoattractant protein-1 (MCP-1) is a marker of active renal vasculitis. *NDT* 2004;19(11):2761-2768.
- Tampe D, et al. Low Serum Levels of Complement C3c at Diagnosis Indicate Poor Outcome in Antineutrophil Cytoplasmic Antibody-Associated Glomerulonephritis. *Kidney Int Rep* 2022;7(3):660-661.
- Thietart S, et al. Evaluation of Rituximab for Induction and Maintenance Therapy in Patients 75 Years and Older With Antineutrophil Cytoplasmic Antibody-Associated Vasculitis. *JAMA Netw Open* 2022;5(7):e2220925.
- Uhlir F, et al. Endopeptidase Cleavage of Anti-Glomerular Basement Membrane Antibodies in vivo in Severe Kidney Disease: An Open-Label Phase 2a Study. *JASN* 2022;33(4):829-838.
- Valderas JM, et al. Defining comorbidity: implications for understanding health and health services. *Ann Fam Med* 2009;7:357-363.
- van Dam LS, et al. PR3-ANCA predict relapses in ANCA-associated vasculitis patients after rituximab. *NDT* 2021;36(8):1408-1417.
- van der Heijde D, et al. 2014 Update of the EULAR standardised operating procedures for EULAR-endorsed recommendations. *Ann Rheum Dis* 2015;74(1):8-13.
- Venhoff N, et al. Impact of Rituximab on Immunoglobulin Concentrations and B Cell Numbers after Cyclophosphamide Treatment in Patients with ANCA-Associated Vasculitides. *PLOSone* 2012;<https://doi.org/10.1371/journal.pone.0037626>.
- Walsh M, et al. Plasma Exchange and Glucocorticoids in Severe ANCA-Associated Vasculitis. *N Engl J Med* 2020;382(7):622-631.
- Walsh M, et al. The effects of plasma exchange in patients with ANCA-associated vasculitis: an updated systematic review and meta-analysis. *BMJ* 2022;376:e064604.
- Watts RA, et al. Global epidemiology of vasculitis. *Nat Rev Rheumatol* 2022;18:22-34.
- West BC, et al. Wegener Granulomatosis and Trimethoprim-Sulfamethoxazole. Complete remission after a twenty-year course. *Ann Int Med* 1987;106(6):840-842.
- Windpessl M, et al. ANCA Status or Clinical Phenotype - What Counts More? *Curr Rheum Rep* 2021;23(6):37.
- Xiao H, et al. C5a receptor (CD88) blockade protects against MPO-ANCA GN. *J Am Soc Nephrol* 2014;25(2):225-231.
- Yates M, et al. EULAR/ERA-EDTA recommendations for the management of ANCA-associated vasculitis. *Ann Rheum Dis* 2016;75(9):1583-1594.
- Zipfel PF, et al. Complement catalyzing glomerular diseases. *Cell Tissue Res* 2021;385:355-370.
- Zipfel PF, et al. Complement Inhibitors in Clinical Trials for Glomerular Diseases. *Frontiers Immunol* 2019;10:2166.

Die Fachpersonen können bei Vifor Pharma Switzerland AG eine vollständige Kopie des zitierten Prüfungsberichts anfordern.

Gekürzte Verschreibungsinformationen

Deutschland

▼ Dieses Arzneimittel unterliegt einer zusätzlichen Überwachung. Dies ermöglicht eine schnelle Identifizierung neuer Sicherheitsdaten. Angehörige der Gesundheitsberufe werden gebeten, alle Verdachtsfälle von unerwünschten Wirkungen zu melden.

TAVNEOS® ▼ 10 mg Hartkapseln: **Wirkstoff:** Avacopan. **Zusammensetzung:** Jede Hartkapsel enthält 10 mg Avacopan. Sonstige Bestandteile mit bekannter Wirkung: 245 mg Macrogolglycerolhydroxystearat (Ph.Eur.). **Anwendungsgebiete:** Tavneos ist in Kombination mit einem Rituximab- oder Cyclophosphamid-Dosierungsschema indiziert zur Behandlung erwachsener Patienten mit schwerer aktiver Granulomatose mit Polyangiitis (GPA) oder mikroskopischer Polyangiitis (MPA). **Gegenanzeigen:** Überempfindlichkeit gegen den Wirkstoff oder einen der sonstigen Bestandteile. **Nebenwirkungen:** Sehr häufig: Übelkeit, Kopfschmerzen, erniedrigte Leukozytenzahl, Infektion der oberen Atemwege, Diarrhö, Erbrechen, Nasopharyngitis, erhöhte Werte in Leberfunktionstests. Häufig: Pneumonie, Rhinitis, Harnwegsinfektion, Sinusitis, Bronchitis, Gastroenteritis, Infektion der unteren Atemwege, Zellulitis, Herpes zoster, Influenza, Orale Candidose, Oraler Herpes, Otitis media, Neutropenie, Schmerzen im Oberbauch, erhöhte Kreatinphosphokinase im Blut. Gelegentlich: Angioödem. **VERSCHREIBUNGSPFLICHTIG. Fachinformation beachten. Pharmazeutischer Unternehmer:** Vifor Fresenius Medical Care Renal Pharma France, 100-101 Terrasse Boieldieu, Tour Franklin La Défense 8, 92042 Paris La Défense Cedex, Frankreich. **Stand der Information:** Februar 2022

Österreich

▼ Dieses Arzneimittel unterliegt einer zusätzlichen Überwachung. Dies ermöglicht eine schnelle Identifizierung neuer Sicherheitsdaten. Angehörige der Gesundheitsberufe werden gebeten, alle Verdachtsfälle von unerwünschten Wirkungen zu melden.

Tavneos® Fachkurzinformation: Tavneos®10mg Hartkapsel. **Zusammensetzung:** Jede Hartkapsel enthält 10 mg Avacopan. Sonstige Bestandteile mit bekannter Wirkung: 245 mg Macrogolglycerolhydroxystearat (Ph.Eur.). **Anwendungsgebiete:** Tavneos® ist in Kombination mit einem Rituximab- oder Cyclophosphamid-Dosierungsschema indiziert zur Behandlung erwachsener Patienten mit schwerer aktiver Granulomatose mit Polyangiitis (GPA) oder mikroskopischer Polyangiitis (MPA). **Gegenanzeigen:** Überempfindlichkeit gegen den Wirkstoff oder einen der sonstigen Bestandteile. Pharmakotherapeutische Gruppe: L04AJ05 Complement Inhibitors **ATC-Code:** L04AJ05. **Inhaber der Zulassung:** Vifor France, 100-101 Terrasse Boieldieu Tour Franklin La Defense 8 92042 Paris La Defense Cedex, Frankreich. Rezept- und apothekenpflichtig. Weitere Angaben zu Warnhinweisen und Vorsichtsmaßnahmen für die Anwendung, Wechselwirkungen mit anderen Arzneimitteln oder sonstigen Wechselwirkungen, Schwangerschaft und Stillzeit und Nebenwirkungen sowie Gewöhnungseffekten sind der veröffentlichten Fachinformation zu entnehmen. Stand der Information: Letzter Stand Fachinformation

Schweiz

▼ Dieses Arzneimittel unterliegt einer zusätzlichen Überwachung. Für weitere Informationen, siehe Fachinformation TAVNEOS® auf www.swissmedinfo.ch.

Tavneos®: Z: Avacopan. **I:** Tavneos, als ergänzende Therapie zu einer immunsuppressiven Standardbehandlung auf Basis von Rituximab oder Cyclophosphamid mit Glukokortikoiden, ist für die Behandlung erwachsener Patienten mit schwerer aktiver ANCA Vaskulitis (GPA/MPA) indiziert. **D:** Orale Einnahme morgens und abends 2x täglich 30 mg (3 Kapseln zu je 10 mg) mit Nahrung. **KI:** Überempfindlichkeit gegen den Wirkstoff oder einen der Hilfsstoffe. **VM:** Hepatotoxizität; Angioödem; Überwachung des Blutbildes (weisse Blutkörperchen); Schwere Infektionen; Reaktivierung des Hepatitis-B-Virus; Herzbeschwerden; Bösartige Tumore; Macroglycerinhydroxystearat. **S/S:** Eine Anwendung während der Schwangerschaft und bei Frauen im gebärfähigen Alter, die keine Verhütungsmethode anwenden, ist nicht empfohlen. Es ist nicht bekannt, ob Avacopan in die Muttermilch ausgeschieden wird. Der Nutzen des Stillens für das Kind sollte gegen den Nutzen der Behandlung für die Patientin abgewogen werden. **UW:** Sehr häufig: Infektion der oberen Atemwege, Nasopharyngitis; Kopfschmerzen; Erbrechen, Durchfall, Übelkeit; erhöhter Lebertest; verminderte Anzahl weisser Blutkörperchen. Häufig: Lungenentzündung, Infektion der unteren Atemwege, Influenza, Bronchitis, Zellulitis, Infektion der Harnwege, Herpes zoster, Sinusitis, orale Candidose, Herpes im Mundbereich, Otitis media, Rhinitis, Gastroenteritis; Neutropenie; Oberbauchschmerzen; Anstieg der Kreatinphosphokinase im Blut. Gelegentlich: Angioödeme. **IA:** Avacopan ist ein Substrat von CYP3A4. Die gleichzeitige Verabreichung von Induktoren oder Inhibitoren dieses Enzyms kann die Pharmakokinetik von Avacopan beeinflussen. Siehe Fachinformation. **P:** Tavneos 10 mg: 30 und 180 Hartkapseln. **Liste B.** Detaillierte Informationen: www.swissmedinfo.ch. Stand der Information: September 2022. **Zulassungsinhaber:** Vifor Fresenius Medical Care Renal Pharma Ltd., St. Gallen. **Vertrieb:** Vifor Pharma Switzerland AG, CH-1752 Villars-sur-Glâne | CH-AVA-2300011