Appendix 1: The diagnostic criteria for MPP

The diagnosis of MPP was established according to the following criteria (27):

(I) Clinical and radiographic features: presence of fever, cough, or auscultatory abnormalities (e.g., crackles or wheezing) combined with radiographic evidence of pulmonary infiltrates on chest imaging;

(II) Laboratory confirmation: either (i) detection of MP DNA or RNA in nasopharyngeal secretions via polymerase chain reaction (PCR); (ii) a ≥4-fold increase in MP-specific immunoglobulin M (IgM) antibody titers between paired acute and convalescent serum samples; or (iii) a single IgM antibody titer ≥1:160.

Appendix 2: Classification of the severity of MPP

(I) Mild MPP: criteria for severe or critical MPP not met;

(II) Severe MPP: defined by the presence of any of the following criteria:
- (i) Persistent high fever (≥39 ℃) for ≥5 days or fever lasting ≥7 days without a downward trend in temperature peaks;
- (ii) Development of wheezing, dyspnea, respiratory distress, chest pain, or hemoptysis;
- (iii) Presence of extrapulmonary complications not meeting the criteria for critical illness;
- (iv) Resting peripheral capillary oxygen saturation (SpO_2) ≤0.93 on room air;
- (v) Radiological findings meeting any of the following conditions:
  - Homogeneous, high-density consolidation involving ≥2/3 of a single lung lobe or high-density consolidation in at least two lung lobes regardless of the affected area, potentially accompanied by moderate-to-large pleural effusion or localized bronchiolitis;
  - Diffuse involvement of a single lung or bronchiolitis affecting ≥4/5 of both lungs, potentially associated with bronchitis, mucus plug formation, or resultant atelectasis;
- (vi) Progressive clinical deterioration with radiological evidence of disease progression exceeding 50% within 24–48 hours;
- (vii) Significant elevation in at least one of the following biomarkers: CRP, LDH, or D-dimer;

(III) Critical MPP: defined as the presence of respiratory failure and/or life-threatening severe extrapulmonary complications requiring mechanical ventilation or other life-support measures (27).

Appendix 3: Etiological testing

For each category of pathogens, at least one of the following diagnostic tests was performed. A positive result in any test within a category was considered indicative of bacterial, viral, or atypical pathogen infection. Additionally, the presence of a positive result in any test from multiple categories was defined as coinfection.

(I) Bacterial testing:
- (i) Blood culture for bacterial pathogens;
- (ii) Sputum smear and culture: sputum cultures were performed, and the presence of a predominant bacterial strain was considered pathogenic;
- (iii) Bronchoalveolar lavage fluid (BALF) bacterial culture or metagenomic next-generation sequencing (mNGS);

(II) Viral testing: detection of parainfluenza virus, influenza A virus, and adenovirus was performed through nucleic acid testing of nasal secretions using PCR to identify viral DNA or RNA;

(III) Atypical pathogen testing: detection of *Chlamydia* using the following methods:
- (i) Serological testing for specific antibodies: measurement of pathogen-specific immunoglobulin G (IgG) and IgM antibodies;
- (ii) Nucleic acid detection in nasal secretions or BALF: PCR-based detection of pathogen-specific DNA or RNA.

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Appendix 4: Indications for chest CT in patients with MPP

Chest CT should be considered in patients with MPP under the following conditions: the presence of severe complications such as suspected lung abscess, pulmonary necrosis, pleural effusion, or atelectasis; poor clinical response to treatment within 48–72 hours; the need to exclude alternative diagnoses; inconsistency between clinical manifestations and chest radiograph findings; or in cases of recurrent pneumonia (36-40).

Appendix 5: Detailed methodology of the UV-Net for pulmonary vascular analysis

This study employed a deep learning framework, UV-Net, for three-dimensional (3D) pulmonary vascular segmentation. The model integrates a U-shaped network architecture comprising two-dimensional (2D) encoder modules and 3D decoder modules, allowing effective adaptation to data characteristics (28). To enhance the receptive field and incorporate global contextual information, the network incorporates an atrous spatial pyramid pooling (ASPP) module, which merges multiscale feature maps to preserve both spatial and semantic details. For upsampling, the model employs the PixelShuffle technique to restore spatial resolution while maintaining fine anatomical structures, ensuring a continuous and topologically coherent segmentation of pulmonary vessels and airways. The segmentation pipeline involves the initial delineation of lung lobes with well-defined boundaries and is followed by airway segmentation that preserves the tree-like connectivity of bronchial structures. Additionally, the vascular segmentation module generates a complete and connected vascular network, enabling accurate quantification of blood vessel volumes based on cross-sectional areas. During internal validation, the algorithm demonstrated high segmentation accuracy, achieving Dice coefficients of 92.68% for arteries and 89.96% for veins. These results highlight the robustness and clinical applicability of UV-Net in pulmonary vascular analysis.

Appendix 6: Details on the selection of machine learning algorithms

To develop a predictive model for RMPP, we evaluated five machine learning algorithms: XGBoost, support vector machine (SVM), light gradient boosting machine (LightGBM), LR, and k-nearest neighbors (KNN). XGBoost, officially introduced in 2016, is an advanced ensemble learning algorithm that constructs multiple classification and regression trees within an optimized distributed gradient boosting framework. It offers greater complexity and improved performance compared to traditional machine learning algorithms (41,42). LightGBM is a high-performance, distributed gradient boosting framework based on decision trees. It is widely used for ranking, classification, and other machine learning tasks (43). LR is a widely used linear classification model that evaluates the relationship between a dependent variable and multiple independent variables, making it particularly suitable for binary classification problems (44). SVM is a supervised learning algorithm designed to construct an optimal hyperplane for separating positive and negative samples, demonstrating strong performance in binary classification and high-dimensional datasets (45). KNN is a non-parametric, instance-based learning algorithm that classifies samples based on their proximity to labeled instances. It is a simple yet effective tool for performing multiclass classification and solving problems involving nonlinear decision boundaries (46).

For these models, we incorporated the 19 variables selected via LASSO regression and optimized hyperparameters via five-fold cross-validation based on mean performance metrics. The final models were subsequently retrained on the entire cross-validation cohort using the identified optimal hyperparameters. Model performance was comprehensively evaluated using ROC curve analysis, with key metrics including the AUC, accuracy, precision, sensitivity, specificity, and F1 score in both the cross-validation and external testing cohorts. As shown in *Table S1*, XGBoost exhibited the best performance across both datasets and was therefore selected as the final algorithm for analysis.

All models were developed in R software (version 4.3.1) via the "caret", "glmnet", "knn", "e1071", "lightgbm", and "xgboost" packages.

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References

36. Harris M, Clark J, Coote N, Fletcher P, Harnden A, McKean M, Thomson A; British Thoracic Society Standards of Care Committee. British Thoracic Society guidelines for the management of community acquired pneumonia in children: update 2011. Thorax 2011;66 Suppl 2:ii1-23.
37. The Subspecialty Group of Respiratory, the Society of Pediatrics, Chinese Medical Association; China Medicine Education Association Committee on Pediatrcis; Editorial Board, Chinese Journal of Pediatrics. Guidelines for the management of community-acquired pneumonia in children (2024 revision). Chinese Journal of Pediatrics 2024;62:920-30.
38. Devitt M. PIDS and IDSA issue management guidelines for community-acquired pneumonia in infants and young children. Am Fam Physician 2012;86:196-202.
39. Pabary R, Balfour-Lynn IM. Complicated pneumonia in children. Breathe 2013;9:210-22.
40. Bradley JS, Byington CL, Shah SS, Alverson B, Carter ER, Harrison C, Kaplan SL, Mace SE, McCracken GH Jr, Moore MR, St Peter SD, Stockwell JA, Swanson JT; Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. The management of community-acquired pneumonia in infants and children older than 3 months of age: clinical practice guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. Clin Infect Dis 2011;53:e25-76.
41. Chen T, Guestrin C. XGBoost: A Scalable Tree Boosting System. In: Proceedings of the 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining. 2016:785-94.
42. Nielsen D. Tree boosting with xgboost-why does xgboost win" every" machine learning competition? Taibei City: National Taiwan Normal University (NTNU); 2016.
43. Ke G, Meng Q, Finley T, Wang T, Chen W, Ma W, Ye Q, Liu TY. Lightgbm: A highly efficient gradient boosting decision tree. In: Advances in Neural Information Processing Systems 30 (NIPS 2017). 2017.
44. Maulud D, Abdulazeez AM. A review on linear regression comprehensive in machine learning. Journal of Applied Science and Technology Trends 2020;1:140-7.
45. Suthaharan S. Support Vector Machine. In: Suthaharan S. editor. Machine Learning Models and Algorithms for Big Data Classification: Thinking with Examples for Effective Learning. Boston: Springer; 2016:207-35.
46. Peterson LE. K-nearest neighbor. Scholarpedia 2009;4:1883.

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Table S1 Performance metrics of clinical-BV models using machine learning algorithms in cross-validation and external testing cohorts

Cohort	Algorithm	AUC (95% CI)	Accuracy	Precision	Sensitivity	Specificity	F1 score
Cross-validation cohort	XGBoost	0.91 (0.89–0.94)	0.83	0.81	0.88	0.77	0.84
	SVM	0.86 (0.83–0.89)	0.79	0.79	0.82	0.77	0.80
	LightGBM	0.88 (0.86–0.91)	0.80	0.72	0.86	0.77	0.78
	LR	0.85 (0.82–0.88)	0.78	0.77	0.82	0.74	0.79
	KNN	0.81 (0.78–0.85)	0.75	0.73	0.82	0.67	0.77
External testing cohort	XGBoost	0.84 (0.77–0.92)	0.79	0.87	0.81	0.76	0.84
	SVM	0.83 (0.75–0.91)	0.72	0.90	0.65	0.85	0.76
	LightGBM	0.82 (0.86–0.91)	0.76	0.51	0.68	0.78	0.58
	LR	0.84 (0.76–0.91)	0.73	0.90	0.67	0.85	0.77
	KNN	0.80 (0.72–0.90)	0.55	0.86	0.39	0.88	0.53

This table presents the performance metrics of the clinical-BV models, which incorporate all 19 variables selected by LASSO regression. The models were built using XGBoost, SVM, LightGBM, LR, and KNN algorithms. The evaluated metrics include the AUC with 95% CI, accuracy, sensitivity, specificity, precision, and F1 score for both the cross-validation and external testing cohorts. AUC, area under the ROC curve; CI, confidence interval; clinical-BV, clinical-blood volume; KNN, k-nearest neighbors; LASSO, least absolute shrinkage and selection operator; LightGBM, light gradient boosting machine; LR, logistic regression; ROC, receiver operating characteristic; SVM, support vector machine; XGBoost, extreme gradient boosting.

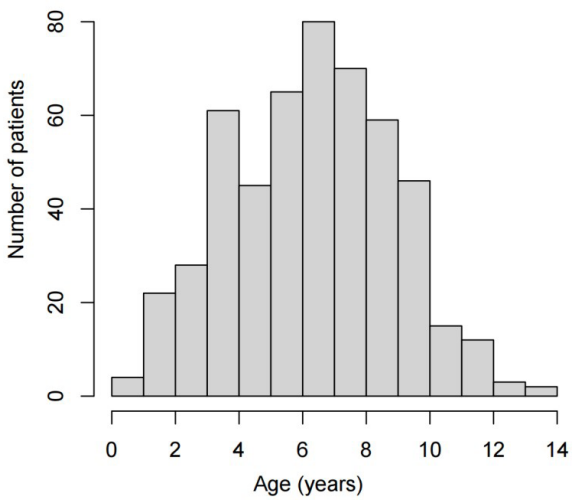

Figure S1 Age distribution in the cross-validation cohort. This density histogram depicts the age distribution within the cross-validation cohort. The histogram bars represent the frequency of each age interval.

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Table S2 Comparative analysis of clinical management and outcomes between RMPP and non-RMPP patients in the cross-validation cohort

Parameters	All cohorts (n=512)	Non-RMPP (n=265)	RMPP (n=247)	P
Length of hospitalization (days)	7.00 (5.00, 9.00)	6.00 (5.00, 7.00)	8.00 (6.00, 10.00)	<0.001*
Total fever duration (days)	9.00 (7.00, 11.00)	7.00 (6.00, 9.00)	10.00 (8.00, 13.00)	<0.001*
Pulmonary complications	210 (41.02)	94 (35.47)	116 (46.96)	0.01*
Atelectasis	138 (26.95)	69 (26.04)	69 (27.94)	0.70
Pleural effusion	133 (25.98)	52 (19.62)	81 (32.79)	0.001*
Necrotizing pneumonia	13 (2.54)	3 (1.13)	10 (4.05)	0.07
Plastic bronchitis	9 (1.76)	2 (0.75)	7 (2.83)	0.15
Pulmonary embolism	3 (0.59)	0 (0.00)	3 (1.21)	0.22
Hydropneumothorax	1 (0.20)	0 (0.00)	1 (0.40)	0.97
Extrapulmonary complications	2 (0.39)	0 (0.00)	2 (0.81)	0.45
Ascites	1 (0.20)	0 (0.00)	1 (0.40)	0.97
Iliac vein thrombosis	1 (0.20)	0 (0.00)	1 (0.40)	0.97
Glucocorticoid therapy during treatment	389 (75.98)	178 (67.17)	211 (85.43)	<0.001*
Glucocorticoid administration timing (days)	6.00 (5.00, 8.00)	6.00 (4.00, 8.00)	7.00 (5.00, 9.00)	<0.001*
Use of intravenous immunoglobulin therapy	9 (1.76)	1 (0.38)	8 (3.24)	0.03*
Use of flexible bronchoscopy during treatment	200 (39.06)	86 (32.45)	114 (46.15)	0.002*
Initial bronchoscopy timing (days)	9.00 (7.00, 11.00)	8.00 (6.00, 9.00)	10.00 (8.00, 13.00)	<0.001*
Findings on bronchoscopy				0.11
Bronchi inflammation	160 (80.40)	74 (87.06)	86 (75.44)	
Bronchial inflammation with mucous plugs	30 (15.08)	9 (10.59)	21 (18.42)	
Plastic bronchitis	9 (4.52)	2 (2.35)	7 (6.14)	

Data are presented as median (IQR) or n (%). *, P<0.05. IQR, interquartile range; RMPP, refractory *Mycoplasma pneumonia* pneumonia.

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Table S3 Comparative analysis of etiological findings in the cross-validation cohort

Parameters	All cohorts (n=512)	Non-RMPP (n=265)	RMPP (n=247)	P
Coinfection	64 (12.50)	26 (9.81)	38 (15.38)	0.08
Chlamydia pneumoniae (n=491)	39 (7.94)	16 (6.23)	23 (9.83)	0.19
Patients with viral detection	60 (11.72)	18 (6.79)	42 (17.00)	
Influenza A virus	2 (3.33)	0 (0.00)	2 (4.76)	0.88
Parainfluenza virus	1 (1.96)	0 (0.00)	1 (2.86)	>0.99
Adenovirus	4 (6.67)	1 (5.56)	3 (7.14)	>0.99
Patients with bacterial cultures	512 (100.00)	265 (100.00)	247 (100.00)	
Klebsiella pneumoniae	1 (0.20)	1 (0.38)	0 (0.00)	>0.99
Streptococcus pneumoniae	7 (1.37)	2 (0.75)	5 (2.02)	0.39
Staphylococcus aureus	7 (1.37)	3 (1.13)	4 (1.62)	0.93
Moraxella catarrhalis	3 (0.59)	3 (1.13)	0 (0.00)	0.27
Haemophilus influenzae	4 (0.78)	0 (0.00)	4 (1.62)	0.11
Pseudomonas aeruginosa	1 (0.20)	1 (0.38)	0 (0.00)	>0.99

Data are presented as n (%). Sample sizes in parentheses next to variable names indicate the number of patients who underwent the respective test. RMPP, refractory *Mycoplasma pneumonia* pneumonia.

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Table S4 Comparative analysis of laboratory findings between RMPP and non-RMPP patients in the cross-validation cohort

Parameters	All cohorts (n=512)	Non-RMPP (n=265)	RMPP (n=247)	P
CRP (mg/L) (n=483)	9.92 (3.95, 19.69)	8.29 (3.56, 16.57)	11.22 (5.20, 22.10)	0.009*
ESR (mm/h) (n=467)	24.69 (16.00, 36.52)	23.76 (15.46, 34.20)	25.67 (16.65, 39.00)	0.07
PCT (ng/mL) (n=484)	0.10 (0.07, 0.17)	0.10 (0.07, 0.15)	0.11 (0.07, 0.22)	0.007*
Patients with complete blood count	483 (94.34)	245 (92.45)	238 (96.36)	
WBC ($\times10^9$/L)	7.25 (5.65, 9.32)	7.03 (5.56, 8.69)	7.40 (5.73, 10.01)	0.12
Neutrophil count ($\times10^9$/L)	4.52 (3.38, 6.05)	4.33 (3.27, 5.63)	4.81 (3.48, 6.32)	0.03*
Monocyte count ($\times10^9$/L)	0.51 (0.34, 0.69)	0.50 (0.35, 0.66)	0.53 (0.34, 0.72)	0.24
Lymphocyte count ($\times10^9$/L)	1.77 (1.32, 2.62)	1.78 (1.32, 2.64)	1.77 (1.33, 2.55)	0.73
Basophil count ($\times10^9$/L)	0.01 (0.01, 0.02)	0.01 (0.01, 0.02)	0.01 (0.01, 0.02)	0.17
Eosinophil count ($\times10^9$/L)	0.05 (0.01, 0.16)	0.05 (0.01, 0.16)	0.05 (0.01, 0.17)	0.69
RBC ($\times10^{12}$/L)	4.34 (4.14, 4.59)	4.36 (4.17, 4.61)	4.33 (4.10, 4.55)	0.15
MCV (fL)	83.10 (80.95, 85.00)	83.10 (81.00, 84.90)	82.90 (80.80, 85.27)	0.65
HCT (%)	38.80 (37.00, 40.80)	38.80 (36.85, 40.85)	38.80 (37.10, 40.80)	0.84
HGB (g/dL)	122.00 (116.00, 128.00)	122.00 (117.00, 129.00)	121.00 (116.00, 127.00)	0.10
PLT ($\times10^9$/L)	281.00 (224.50, 377.00)	276.00 (224.00, 363.00)	284.00 (225.00, 377.00)	0.71
PDW (fL)	15.90 (15.60, 16.10)	15.90 (15.70, 16.10)	15.80 (15.60, 16.10)	0.053
MPV (fL)	9.50 (8.90, 10.20)	9.50 (8.80, 10.20)	9.50 (9.00, 10.20)	0.36
Plateletcrit (%)	0.28 (0.22, 0.34)	0.27 (0.22, 0.33)	0.28 (0.22, 0.36)	0.29
Patients with hepatic function tests	508 (99.22)	264 (99.62)	244 (98.79)	
LDH (U/L)	359.50 (276.75, 543.75)	331.50 (259.75, 505.00)	387.00 (300.00, 591.50)	0.002*
GGT (U/L)	12.00 (11.00, 14.00)	12.00 (11.00, 14.00)	13.00 (11.00, 15.00)	0.15
ALT (U/L)	14.00 (11.00, 20.00)	13.00 (11.00, 18.00)	15.00 (12.00, 22.00)	<0.001*
AST (U/L)	37.00 (28.00, 52.00)	35.00 (26.75, 48.25)	40.00 (29.00, 57.00)	0.005*
Total protein (g/L)	69.15 (65.90, 72.10)	69.75 (66.60, 72.80)	68.60 (65.00, 71.53)	0.003*
Albumin (g/L)	40.20 (38.20, 42.20)	40.80 (38.90, 43.20)	39.30 (37.27, 41.23)	<0.001*
Globulin (g/L)	28.70 (26.70, 31.10)	28.60 (26.70, 30.72)	28.85 (26.78, 31.60)	0.33
Serum prealbumin (mg/L)	115.40 (95.95, 136.60)	118.80 (100.30, 144.60)	109.55 (93.07, 130.77)	<0.001*
Cholinesterase (U/L)	6,829.50 (5,966.50, 7,676.25)	7,027.50 (6,216.25, 7,879.50)	6,625.50 (5,720.25, 7,527.75)	<0.001*
ADA (U/L)	21.65 (18.50, 26.10)	21.40 (18.40, 25.02)	21.85 (18.90, 26.95)	0.13
ALP (U/L)	155.50 (129.00, 183.00)	161.50 (136.75, 193.25)	147.50 (122.00, 176.00)	<0.001*
Total bilirubin (μmol/L)	5.70 (5.00, 6.80)	5.70 (5.00, 6.60)	5.70 (5.00, 6.82)	0.72
Direct bilirubin (μmol/L)	1.40 (1.10, 1.80)	1.45 (1.17, 1.83)	1.40 (1.10, 1.80)	0.21
Indirect bilirubin (μmol/L)	4.30 (3.30, 5.30)	4.30 (3.30, 5.23)	4.35 (3.30, 5.40)	0.48
D-dimer (mg/L FEU) (n=474)	0.53 (0.35, 0.84)	0.46 (0.31, 0.65)	0.64 (0.44, 1.24)	<0.001*
PT (s) (n=446)	11.75 (11.30, 12.40)	11.70 (11.10, 12.35)	11.80 (11.40, 12.50)	0.053

Table S4 (*continued*)

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Table S4 (*continued*)

Parameters	All cohorts (n=512)	Non-RMPP (n=265)	RMPP (n=247)	P
aPTT (s) (n=487)	28.90 (27.10, 31.05)	29.10 (27.30, 31.40)	28.85 (26.90, 30.70)	0.13
INR (n=487)	1.02 (0.97, 1.08)	1.01 (0.96, 1.07)	1.03 (0.98, 1.09)	0.18
TT (n=440)	17.90 (17.40, 18.60)	18.00 (17.50, 18.60)	17.90 (17.40, 18.50)	0.42
Fibrinogen (g/L) (n=440)	4.04 (0.82)	4.03 (0.78)	4.05 (0.87)	0.81
Patients with renal function and electrolyte tests	508 (99.22)	264 (99.62)	244 (98.79)	
Creatinine (μmol/L)	31.00 (26.00, 37.00)	31.00 (26.00, 36.75)	31.00 (25.00, 38.00)	0.78
Urea (mmol/L)	3.38 (2.81, 4.15)	3.44 (2.82, 4.27)	3.29 (2.80, 3.99)	0.14
Uric acid (μmol/L)	225.00 (187.00, 267.00)	240.50 (199.75, 286.25)	210.50 (176.75, 247.25)	<0.001*
Cystatin C (mg/L)	0.63 (0.56, 0.70)	0.62 (0.56, 0.69)	0.63 (0.58, 0.74)	0.007*
CK (U/L)	93.00 (69.00, 143.25)	97.00 (73.00, 135.50)	90.00 (66.00, 154.00)	0.31
CK-MB (U/L)	21.00 (16.00, 45.00)	21.00 (15.00, 47.75)	21.00 (16.00, 41.25)	0.91
Serum calcium (mmol/L)	2.26 (0.12)	2.28 (0.11)	2.24 (0.13)	<0.001*
Serum potassium (mmol/L)	3.80 (3.50, 4.00)	3.80 (3.60, 4.00)	3.70 (3.50, 4.00)	0.31
Serum phosphate (mmol/L)	1.42 (1.23, 1.60)	1.47 (1.26, 1.64)	1.39 (1.19, 1.54)	0.001*
Serum chloride (mmol/L)	106.00 (104.00, 108.00)	106.00 (104.50, 108.00)	106.00 (104.00, 108.00)	0.04*
Serum sodium (mmol/L)	137.00 (135.00, 139.00)	137.00 (135.00, 139.00)	136.00 (134.00, 139.00)	0.003*
Serum magnesium (mmol/L)	0.90 (0.86, 0.96)	0.90 (0.86, 0.97)	0.90 (0.85, 0.96)	0.74

Data are presented as median (IQR) or n (%). Sample sizes in parentheses next to variable names indicate the number of patients who underwent the respective test. ADA, adenosine deaminase; ALT, alanine aminotransferase; ALP, alkaline phosphatase; aPTT, activated partial thromboplastin time; AST, aspartate aminotransferase; CK, creatine kinase; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; FEU, fibrinogen equivalent unit; GGT, gamma-glutamyl transferase; HCT, hematocrit; HGB, hemoglobin; INR, international normalized ratio; IQR, interquartile range; LDH, lactate dehydrogenase; MCV, mean corpuscular volume; MPV, mean platelet volume; PCT, procalcitonin; PDW, platelet distribution width; PLT, platelet count; PT, prothrombin time; RBC, red blood cell count; RMPP, refractory *Mycoplasma pneumonia* pneumonia; TT, thrombin time; WBC, white blood cell count.

Table S5 Comparison of baseline and follow-up radiological characteristics among patients with MPP in the cross-validation cohort

Parameters	Baseline (n=512)	Follow-up (n=512)	P
BV5%	59.80 (55.56, 64.16)	63.07 (59.07, 66.96)	<0.001*
BV5–10%	15.48 (13.05, 17.50)	14.62 (12.70, 16.81)	0.01*
BV10%	20.17 (17.51, 22.83)	18.71 (16.62, 20.95)	<0.001*

Data are presented as median (IQR). *, P<0.05. BV5%, the percentage of PBV contained in vessels with a cross-sectional area less than 5 mm^2; BV5–10%, the percentage of PBV contained in vessels with a cross-sectional area between 5 and 10 mm^2; BV10%, the percentage of PBV contained in vessels with a cross-sectional area greater than 10 mm^2; IQR, interquartile range; MPP, *Mycoplasma pneumonia* pneumonia; PBV, pulmonary blood volume.

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Table S6 Comparison of baseline demographic, clinical, radiological, and laboratory characteristics between RMPP and non-RMPP in the external testing cohort

Parameters	All cohorts (n=124)	Non-RMPP (n=83)	RMPP (n=41)	P
Sex				0.51
Male	52 (41.94)	37 (44.58)	15 (36.59)	
Female	72 (58.06)	46 (55.42)	26 (63.41)	
Age (years)	7.00 (5.00, 9.00)	7.00 (5.00, 9.50)	6.00 (4.00, 9.00)	0.23
Comorbidity	1 (0.81)	1 (1.20)	0 (0.00)	1.00
Coinfection	41 (33.06)	26 (31.33)	15 (36.59)	0.70
Fever duration before admission (days)	6.00 (4.00, 7.00)	6.00 (4.00, 7.00)	7.00 (5.00, 7.00)	0.20
Cough duration before admission (days)	6.00 (4.00, 8.00)	6.00 (4.00, 8.00)	6.00 (4.00, 8.00)	0.72
Severe pneumonia	89 (71.77)	51 (61.45)	38 (92.68)	<0.001*
Duration of azithromycin therapy before admission (days)	2.00 (0.00, 4.00)	1.00 (0.00, 3.00)	3.00 (1.00, 6.00)	<0.001*
Preadmission use of glucocorticoid therapy	25 (20.16)	19 (22.89)	6 (14.63)	0.40
Requirement for oxygen support	6 (4.84)	1 (1.20)	5 (12.20)	0.03*
Patients with vital signs	115 (92.74)	78 (93.98)	37 (90.24)	
Temperature (℃)	36.90 (36.50, 38.00)	36.80 (36.40, 37.55)	38.00 (36.80, 38.50)	<0.001*
Pulse rate (beats/min)	106.00 (97.50, 116.00)	104.00 (96.00, 112.00)	108.00 (102.00, 121.00)	0.09
Respiratory rate (breaths/min)	24.00 (23.00, 26.00)	24.00 (22.00, 26.00)	24.00 (24.00, 26.00)	0.21
SpO_2 (%)	98.00 (97.00, 99.00)	98.00 (98.00, 99.00)	98.00 (97.00, 98.00)	0.004*
Quantitative CT parameters				
BV5%	55.38 (51.69, 59.52)	56.70 (53.94, 61.02)	51.30 (48.41, 56.60)	<0.001*
BV5–10%	17.92 (13.67, 20.80)	15.39 (13.23, 19.34)	20.53 (17.43, 23.54)	<0.001*
BV10%	22.23 (3.26)	21.79 (2.89)	23.13 (3.78)	0.03*
Laboratory findings				
CRP (mg/L) (n=123)	7.16 (3.00, 14.95)	7.06 (2.80, 13.30)	7.17 (3.58, 16.33)	0.75
PCT (ng/mL) (n=77)	0.11 (0.04, 0.19)	0.08 (0.03, 0.16)	0.19 (0.09, 0.30)	0.003*
Patients with complete blood count	91 (73.39)	59 (71.08)	32 (78.05)	
WBC ($\times10^9$/L)	8.13 (6.19, 10.68)	8.03 (5.91, 11.05)	8.36 (7.07, 10.22)	0.56
Neutrophil count ($\times10^9$/L)	4.44 (3.33, 7.17)	4.22 (3.28, 6.94)	5.02 (3.65, 7.25)	0.57
Monocyte count ($\times10^9$/L)	0.61 (0.37, 0.86)	0.56 (0.35, 0.84)	0.72 (0.44, 0.88)	0.29
Lymphocyte count ($\times10^9$/L)	2.11 (1.77, 3.38)	2.10 (1.77, 3.42)	2.36 (1.84, 3.16)	0.68
Basophil count ($\times10^9$/L)	0.02 (0.01, 0.03)	0.02 (0.01, 0.03)	0.02 (0.01, 0.03)	0.46
Eosinophil count ($\times10^9$/L)	0.09 (0.01, 0.17)	0.10 (0.01, 0.18)	0.08 (0.03, 0.16)	0.77
RBC ($\times10^{12}$/L)	4.45 (0.34)	4.48 (0.35)	4.40 (0.33)	0.31
MCV (fL)	80.50 (4.20)	80.25 (4.45)	80.93 (3.77)	0.48
HCT (%)	36.00 (34.00, 37.00)	36.00 (34.00, 38.00)	35.00 (34.00, 36.75)	0.41

Table S6 (*continued*)

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Table S6 (*continued*)

Parameters	All cohorts (n=124)	Non-RMPP (n=83)	RMPP (n=41)	P
HGB (g/dL)	124.00 (119.00, 129.00)	124.50 (119.00, 129.00)	123.50 (119.25, 131.50)	0.87
PLT (×10^9/L)	342.18 (115.56)	345.35 (121.81)	336.70 (105.62)	0.75
PDW (fL)	9.25 (8.40, 9.78)	9.20 (8.47, 9.70)	9.45 (8.40, 10.10)	0.61
MPV (fL)	9.10 (8.80, 9.60)	9.10 (8.80, 9.60)	9.15 (8.90, 9.60)	0.54
Plateletcrit	0.30 (0.24, 0.37)	0.32 (0.24, 0.38)	0.30 (0.25, 0.35)	0.82
Patients with hepatic function tests	118 (95.16)	80 (96.39)	38 (92.68)	
GGT (U/L)	12.00 (11.00, 14.00)	12.00 (10.75, 14.00)	12.00 (11.00, 13.00)	0.95
ALT (U/L)	20.00 (18.00, 24.00)	20.00 (17.75, 24.25)	21.00 (19.25, 24.00)	0.50
AST (U/L)	25.50 (22.00, 30.00)	26.00 (22.00, 30.00)	25.00 (21.25, 30.00)	0.86
Total protein (g/L)	68.93 (5.15)	69.89 (4.76)	66.91 (5.41)	0.003*
Albumin (g/L)	41.42 (2.98)	41.86 (2.71)	40.49 (3.35)	0.02*
Globulin (g/L)	27.51 (3.88)	28.02 (3.83)	26.42 (3.79)	0.03*
Serum prealbumin (mg/L)	110.50 (96.00, 143.75)	110.00 (97.75, 140.25)	119.50 (90.00, 167.50)	0.65
Cholinesterase (U/L)	6931.38 (1450.02)	7032.09 (1403.17)	6719.37 (1541.67)	0.28
ADA (U/L)	21.50 (17.25, 25.00)	22.00 (17.00, 25.25)	21.00 (18.00, 23.00)	0.45
ALP (U/L)	166.00 (143.50, 197.75)	164.50 (147.75, 197.25)	175.00 (138.00, 199.50)	0.99
Total bilirubin (μmol/L)	5.75 (4.73, 7.10)	5.80 (4.70, 7.03)	5.50 (4.85, 7.60)	0.55
Direct bilirubin (μmol/L)	2.10 (1.90, 2.50)	2.00 (1.90, 2.42)	2.15 (2.00, 2.58)	0.12
Indirect bilirubin (μmol/L)	3.60 (2.80, 4.60)	3.70 (2.80, 4.50)	3.50 (2.73, 5.42)	0.84
CK (U/L) (n=116)	69.50 (54.00, 100.00)	80.00 (54.00, 100.00)	63.00 (45.00, 89.25)	0.14
CK-MB (U/L) (n=116)	3.26 (2.12, 16.25)	3.06 (2.09, 14.00)	8.71 (2.30, 18.25)	0.24

Data are presented as n (%), median (IQR), or mean (SD). The table presents variables with less than 40% missing data in the testing cohort. Sample sizes in parentheses after variable names indicate the number of patients tested. *, P<0.05. ADA, adenosine deaminase; ALP, alkaline phosphatase; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BV5%, the percentage of PBV contained in vessels with a cross-sectional area less than 5 mm^2; BV5–10%, the percentage of PBV contained in vessels with a cross-sectional area between 5 and 10 mm^2; BV10%, the percentage of PBV contained in vessels with a cross-sectional area greater than 10 mm^2; CK, creatine kinase; CRP, C-reactive protein; CT, computed tomography; GGT, gamma-glutamyl transferase; HCT, hematocrit; HGB, hemoglobin; IQR, interquartile range; MCV, mean corpuscular volume; MPV, mean platelet volume; PBV, pulmonary blood volume; PCT, procalcitonin; PDW, platelet distribution width; PLT, platelet count; RBC, red blood cell count; RMPP, refractory Mycoplasma pneumonia pneumonia; SD, standard deviation; SpO_2, peripheral capillary oxygen saturation; WBC, white blood cell count.

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