ISSN NO: 2770-2936
December 2025

Optimizing The Diagnosis Of Patients With Metabolic-Associated Steatohepatitis

Mamajonov Islombek Sardorbek ugli
1st year master's student in the field of therapy
Andijan State Medical Institute
Scientific supervisor: Yaminova Nafisa Khaydaraliyevna
Associate Professor of the Department of Training of Family Doctors
Andijan State Medical Institute

Abstract. Metabolic-associated steatohepatitis, abbreviated as MASH, represents an inflammatory and potentially progressive form of metabolic dysfunction-associated steatotic liver disease, abbreviated as MASLD. Because symptoms are often absent until advanced disease develops, the central diagnostic challenge is not merely detecting steatosis, but identifying the subgroup at risk for clinically meaningful outcomes, especially advanced fibrosis. In routine care, liver biopsy remains the reference standard for confirming steatohepatitis, grading activity, and staging fibrosis, yet it is invasive, costly, and impractical for population-level case finding. As a result, contemporary diagnostic optimization increasingly relies on structured, stepwise strategies that combine simple blood-based fibrosis scores, imaging-based elastography, and selective use of advanced modalities, supported by clear referral pathways across primary care, diabetology, obesity services, and hepatology.
Keywords: metabolic-associated steatohepatitis, MASLD, noninvasive tests, fibrosis risk stratification, transient elastography, magnetic resonance elastography.

INTRODUCTION

Metabolic-associated steatohepatitis is increasingly encountered in clinical practice as cardiometabolic disorders expand worldwide. The clinical urgency of diagnosis is driven less by the presence of steatosis itself and more by the risk of progressive fibrosis, cirrhosis, portal hypertension, hepatocellular carcinoma, and liver-related mortality. Yet this urgency collides with a practical reality: many patients with clinically significant disease have normal or mildly abnormal liver enzymes, lack specific symptoms, and are first seen in settings that are not hepatology clinics, such as primary care, endocrinology, and obesity management. In these settings, broad testing with specialist-only tools is infeasible. Therefore, optimization of diagnosis requires a strategy that is scalable, accurate enough to identify those at risk, and simple enough to be embedded in routine workflows. Contemporary guidance emphasizes case-finding in individuals with cardiometabolic risk factors and evidence of steatosis or abnormal liver enzymes, particularly in those with type 2 diabetes or obesity with additional metabolic risk factors, using noninvasive tests in structured pathways rather than indiscriminate screening of low-prevalence general populations [1].

MATERIALS AND METHODS

A rational diagnostic pathway begins with deciding whom to evaluate and why. In MASLD and suspected MASH, the highest-yield approach is case finding in individuals with cardiometabolic risk factors, abnormal liver enzymes, and or radiologic evidence of hepatic steatosis, with particular attention to type 2 diabetes and obesity because these subgroups carry higher prevalence of advanced fibrosis and progression [1]. In practical terms, this means that diagnosis should often start where the patient is already being managed: diabetes clinics, primary care hypertension and dyslipidemia follow-up, obesity services, and cardiometabolic prevention programs. A major optimization step is shifting from incidental recognition to systematic identification, for example by embedding prompts into electronic records when a patient has obesity and type 2 diabetes plus persistently elevated aminotransferases, or when imaging reports mention fatty liver. The target is not to label everyone with fat in the liver as a specialist case, but to reliably capture the subgroup with significant fibrosis risk who would otherwise remain undiagnosed until complications appear.

ISSN NO: 2770-2936
December 2025

Once a patient is selected for evaluation, initial clinical assessment should confirm the presence of steatotic liver disease and address competing etiologies and cofactors that influence interpretation. This includes careful medication history, metabolic profile, and quantification of alcohol intake. The nomenclature consensus describing MetALD emphasizes that metabolic disease and alcohol exposure can overlap in clinically important ways, and that categorization depends on alcohol amounts rather than simple binary labels [2]. Viral hepatitis testing, assessment for autoimmune liver disease when clinically indicated, and review for hereditary or cholestatic conditions may be required in selected cases. This step is diagnostic housekeeping that prevents downstream errors: a fibrosis score or elastography result may be "accurate" mathematically, yet clinically misleading if the underlying disease context is misclassified.

In many systems, conventional ultrasound remains the most accessible tool for detecting steatosis, but it is not a staging tool and performs poorly when steatosis is mild. Therefore, a key principle in optimizing MASH diagnosis is to avoid overreliance on steatosis detection and instead prioritize fibrosis risk stratification. In other words, identifying fatty liver is not the endpoint; it is the gate that triggers fibrosis assessment. Guidelines on noninvasive testing emphasize that fibrosis stage is central to prognosis across etiologies and that noninvasive tests are particularly valuable for ruling out advanced fibrosis in low-prevalence settings rather than definitively diagnosing it in every case [3]. This immediately implies a workflow design choice: first-line tools should be inexpensive, broadly available, and oriented toward exclusion of advanced fibrosis with high negative predictive value.

RESULTS AND DISCUSSION

For first-line fibrosis risk stratification, simple serum-based scores such as FIB-4 are widely recommended because they use routine laboratory parameters and age. A practical algorithm presented in updated European guidance uses a FIB-4 threshold below 1.30 to identify low-risk individuals who can be managed with lifestyle-focused care and periodic retesting, while those at or above this threshold proceed to secondary testing or specialist evaluation depending on local pathways [3]. An important refinement for diagnostic accuracy is age adjustment: cutoffs may differ in older adults, reducing false positives that arise because age itself is part of the score. The same guidance notes an adjusted FIB-4 cutoff of 2.0 for patients older than 65 years, reflecting the need to interpret scores within demographic context rather than as universal constants [3]. These details are not cosmetic; they can materially change referral volumes and reduce unnecessary specialist burden without compromising detection of advanced disease.

The second-line step aims to either rule in higher risk more confidently or resolve the intermediate zone created by first-line scores. Imaging-based elastography, especially transient elastography, has become a practical workhorse because it provides liver stiffness measurement with point-of-care feasibility. In the EASL noninvasive testing guideline algorithm, a transient elastography threshold below 8 kPa supports low risk, whereas values at or above 8 kPa place the patient into an intermediate to high-risk category that typically warrants specialist assessment or further confirmatory steps [3]. Serum-based patented tests such as the Enhanced Liver Fibrosis test can also be used in second-line triage, with the same guideline listing a cutoff of 9.8 for NAFLD and alcohol-related liver disease contexts in its pathway figure [3]. Diagnostic optimization here is largely about sequencing and combination: using FIB-4 first reduces the number of elastography exams required, and combining unrelated test types can reduce misclassification when one modality is affected by confounders.

A frequent reason real-world diagnostic pathways fail is not the absence of tests but the absence of quality control and interpretation discipline. Transient elastography can be confounded by acute inflammation, cholestasis, congestion, and technical limitations in obesity if inappropriate probes are used or if measurement quality criteria are ignored. The role of imaging-based tools has become prominent enough that AASLD released a dedicated practice guideline on imaging-based noninvasive liver disease assessment of fibrosis and steatosis, highlighting the necessity of integrating these methods responsibly into clinical pathways rather than treating them as standalone answers [4]. An optimized diagnostic workflow therefore includes pretest conditions, operator training, standardized reporting, and explicit actions attached to result categories. Without these, the same device can produce clinically divergent outcomes depending on setting, which erodes clinician trust and undermines pathway adoption.

Magnetic resonance elastography and related advanced imaging techniques offer higher accuracy in many contexts, yet their cost and availability limit their value as first-line tools. The EASL noninvasive testing

ISSN NO: 2770-2936
December 2025

guideline explicitly notes that MRE is the most accurate noninvasive method for staging fibrosis, while also stating that it is not recommended as a first-line test given its cost and limited availability and is therefore more suited to clinical trials or selected scenarios [3]. Diagnostic optimization uses this reality strategically: reserve MRE for cases where transient elastography is unreliable, where results are discordant with clinical suspicion, or where precise staging has downstream consequences such as eligibility for advanced therapies or trial inclusion.

A central tension in MASH diagnosis is that fibrosis is measurable noninvasively with increasing reliability, but steatohepatitis activity is harder. For many clinical decisions, fibrosis risk is sufficient to guide referral, monitoring intensity, and prioritization of metabolic intervention. Yet for some contexts, especially therapeutic trials and certain regulatory endpoints, histologic confirmation of steatohepatitis activity remains necessary. European guidance underscores that liver biopsy remains the reference standard for patient selection in phase IIb and phase III therapeutic trials [3]. The AASLD NAFLD practice guidance similarly frames biopsy as a tool for specific situations rather than a universal diagnostic step, reflecting a broader strategy in which biopsy is used selectively when it will change management, clarify uncertainty, or provide required baseline characterization [5]. In an optimized pathway, biopsy is not a default response to any abnormality; it is an escalation step triggered by predefined uncertainty or necessity.

CONCLUSION

Optimizing the diagnosis of MASH requires shifting from opportunistic detection to structured, risk-stratified pathways that are feasible at scale. Because liver biopsy remains the reference standard for confirming steatohepatitis activity but is not suitable for broad case finding, modern diagnostic strategy prioritizes identification of advanced fibrosis risk using sequential noninvasive tests. A practical model begins with case finding in individuals with cardiometabolic risk factors and evidence of steatosis or abnormal liver enzymes, followed by first-line serum fibrosis scores such as FIB-4, then second-line elastography or validated serum panels for intermediate or high-risk results. Advanced imaging such as magnetic resonance elastography and selective liver biopsy are reserved for discordant findings, unreliable measurements, or contexts in which histology changes management or is required for trials.

REFERENCES

1. European Association for the Study of the Liver; European Association for the Study of Diabetes; European Association for the Study of Obesity. EASL–EASD–EASO Clinical Practice Guidelines on the management of metabolic dysfunction-associated steatotic liver disease MASLD: Executive Summary // Diabetologia. 2024. Vol. 67. No. 11. P. 2375–2392. DOI: 10.1007/s00125-024-06196-3.
2. Rinella M. E., Lazarus J. V., Ratziu V., Francque S. M., Sanyal A. J., Kanwal F. et al. A multisociety Delphi consensus statement on new fatty liver disease nomenclature // Hepatology. 2023. Vol. 78. No. 6. P. 1966–1986. DOI: 10.1097/HEP.0000000000000520.
3. Berzigotti A., Tsochatzis E., Boursier J., Castera L., Cazzagon N., Friedrich-Rust M. et al. EASL Clinical Practice Guidelines on non-invasive tests for evaluation of liver disease severity and prognosis – 2021 update // Journal of Hepatology. 2021. Vol. 75. No. 3. P. 659–689. DOI: 10.1016/j.jhep.2021.05.025.
4. Sterling R. K., Duarte-Rojo A., Patel K., Asrani S. K., Alsawas M., Dranoff J. A. et al. AASLD Practice Guideline on imaging-based noninvasive liver disease assessment of hepatic fibrosis and steatosis // Hepatology. 2025. Vol. 81. No. 2. P. 672–724. DOI: 10.1097/HEP.0000000000000843.
5. Rinella M. E., Neuschwander-Tetri B. A., Siddiqui M. S., Abdelmalek M. F., Caldwell S., Barb D. et al. AASLD Practice Guidance on the clinical assessment and management of nonalcoholic fatty liver disease // Hepatology. 2023. Vol. 77. No. 5. P. 1797–1835. DOI: 10.1097/HEP.0000000000000323.
6. Newsome P. N., Sasso M., Deeks J. J., Paredes A., Boursier J., Chan W. K. et al. FibroScan-AST FAST score for the non-invasive identification of patients with non-alcoholic steatohepatitis with significant activity and fibrosis: a prospective derivation and global validation study // The Lancet Gastroenterology and Hepatology. 2020. Vol. 5. No. 4. P. 362–373. DOI: 10.1016/S2468-1253(19)30383-4.