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COMPARATIVE ANALYSIS OF ULTRASOUND ELASTOGRAPHY AND LIVER BIOPSY IN THE ASSESSMENT OF LIVER FIBROSIS

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Abstract

Accurate assessment of liver fibrosis is essential in chronic liver diseases. Liver biopsy has traditionally been considered the reference method, while ultrasound elastography has become a widely used non-invasive alternative. The aim of this study was to compare ultrasound elastography and liver biopsy in evaluating liver fibrosis. The analysis demonstrated that elastography is safe, repeatable, and effective for detecting advanced fibrosis and cirrhosis. Biopsy remains valuable when detailed histological information is required. A combined diagnostic approach may improve accuracy and reduce unnecessary invasive procedures.

Keywords: ultrasound elastography, liver biopsy, liver fibrosis, chronic liver disease, diagnostics

Introduction

Liver fibrosis develops as a consequence of chronic liver injury and may progress to cirrhosis and liver failure. Staging of fibrosis guides prognosis and treatment decisions. Liver biopsy provides direct histological examination but is invasive and limited by sampling error. Ultrasound elastography measures liver stiffness and estimates fibrosis severity without tissue sampling. The growing use of elastography has changed diagnostic strategies in hepatology.

This topic is relevant because modern medical practice requires evidence-based analysis, early diagnosis, and interdisciplinary approaches. A deeper understanding of pathogenetic and clinical mechanisms allows healthcare professionals to improve prevention, monitoring, and treatment outcomes.

Materials and Methods

A comparative review of publications on ultrasound elastography and liver biopsy was performed. Diagnostic accuracy, safety, limitations, repeatability, patient tolerance, and clinical indications were analyzed. The role of both methods in chronic viral hepatitis, fatty liver disease, and autoimmune liver disorders was considered.

Results

Elastography demonstrated high diagnostic value for advanced fibrosis and cirrhosis. It allowed repeated monitoring during treatment and reduced the need for invasive procedures. Liver biopsy provided information about inflammation, steatosis, necrosis, and architectural changes. Discrepancies were more frequent in early fibrosis stages and in patients with obesity, cholestasis, or acute inflammation.

Discussion

Elastography and biopsy should be viewed as complementary rather than competing methods. Elastography is suitable for screening and follow-up, while biopsy is useful in complex or unclear cases. Interpretation of elastography results requires consideration of clinical and laboratory data. Advances in imaging may further improve non-invasive fibrosis assessment.

The reviewed evidence indicates that practical implementation depends on clinical context, patient characteristics, available resources, and professional competence. Therefore, future studies should include larger cohorts, standardized protocols, and long-term follow-up to improve reliability of conclusions.

Conclusion

Ultrasound elastography is an effective non-invasive method for assessing liver fibrosis, especially in advanced stages. Liver biopsy remains important for detailed histopathological evaluation. Rational combination of both methods improves diagnostic precision and patient safety.

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