



## COMPARATIVE DIAGNOSTIC EFFICACY OF ULTRASOUND AND MRI IN THE DETECTION OF OBSTRUCTIVE JAUNDICE

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### Background and Rationale.

Obstructive jaundice (OJ) is one of the most severe complications of biliopancreatoduodenal diseases, presenting significant diagnostic and therapeutic challenges. Despite advances in imaging technology, the etiology of biliary obstruction remains unidentified in 10–42% of patients at initial presentation. Timely and accurate preoperative diagnosis is critical, as it directly determines the choice of treatment strategy—endoscopic, percutaneous, or open surgical intervention. A comparative evaluation of currently available non-invasive imaging modalities and the development of an evidence-based diagnostic algorithm remain urgent priorities in clinical radiology.

### Objective.

To compare the diagnostic performance of abdominal ultrasound (US) and magnetic resonance cholangiopancreatography (MRCP) in the detection and differential diagnosis of obstructive jaundice of various etiologies.

### Materials and Methods.

A total of 120 patients (55 female, 65 male; mean age  $57.3 \pm 11.4$  years) admitted to Tashkent Medical Academy Hospital with a clinical and laboratory diagnosis of obstructive jaundice between January 2021 and December 2024 were enrolled. All patients underwent standardized abdominal US (Toshiba Aplio 500, 3.5–5 MHz convex transducer) and MRI/MRCP (Siemens Magnetom Aera 1.5T; T1, T2, DWI, 3D SPACE, 2D HASTE sequences; gadolinium contrast enhancement when indicated). Diagnosis was verified by histomorphological examination in 68 patients and by ERCP with subsequent clinical follow-up in 52 patients. Statistical analysis included sensitivity, specificity, overall accuracy, and ROC curve analysis; significance threshold was set at  $p < 0.05$ .

### Results.

Ultrasound demonstrated sensitivity of 89.2% for detecting biliary duct dilatation; however, its accuracy in determining the precise etiology of obstruction decreased to 71.4%. In the differential diagnosis of benign versus malignant obstruction, US achieved an accuracy of



74.2%. MRI/MRCP showed sensitivity of 94.8% and specificity of 91.3% for differential diagnosis ( $p < 0.05$  vs. US). MRCP determined the level of obstruction with 97.5% accuracy. For malignant etiology detection, the AUC of MRI was 0.967 compared to 0.801 for US ( $p < 0.001$ ). In choledocholithiasis, MRCP sensitivity was 94.2%, comparable to ERCP without the associated procedural risks.

### **Conclusion.**

MRI/MRCP demonstrates statistically superior accuracy over US in the differential diagnosis of obstructive jaundice ( $p < 0.05$ ). The two modalities are complementary: US is recommended as a first-line screening tool, while MRI/MRCP should be mandatory for etiological verification and surgical planning. Incorporation of MRI/MRCP into the standard diagnostic protocol for obstructive jaundice is strongly recommended to improve diagnostic accuracy and guide optimal treatment decisions.

**Key words:** *obstructive jaundice, ultrasound, magnetic resonance imaging, MRCP, diagnostic accuracy, differential diagnosis.*