

Pulsed Doppler Ultrasound Utility for Intestinal Obstruction:
—Prediction of Ischemic Progression by Measurement of
the Resistive Index of the Lesion—

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Abstract

Purpose: This study aimed to determine the usefulness of the resistive index (RI), measured with pulsed wave Doppler (PW-Doppler), to predict and stratify ischemic progression in intestinal obstruction. **Subjects and Methods:** We included 64 patients diagnosed with intestinal obstruction using abdominal ultrasonography. We compared the RI values between patients who required surgery and those managed conservatively. Using receiver operating characteristics curves, we determined the RI cut-off value to predict surgery and bowel resection. We also assessed the association to other factors such as blood tests, biochemical markers, ascites, time from onset of symptoms, and bowel resection requirement.

Results and Discussion: The RI was significantly higher in the surgical group than in the conservative treatment group (0.73 ± 0.06 vs. 0.89 ± 0.09 , $p < .01$). Among the surgical cases, the RI was significantly higher in patients requiring bowel resection (0.80 ± 0.10 vs. 0.94 ± 0.06 , $p < .01$). The RI cut-off value for surgery and bowel resection was 0.79 (sensitivity 87.5%, specificity 91.7%) and 0.85 (sensitivity 100%, specificity 72.5%), respectively. Multivariate analysis showed that both the time of onset and a high RI were associated with bowel resection. If pulsatile blood flow with a high RI is observed on PW-Doppler arterial perfusion is considered to be decreased due to venous congestion, suggesting venous strangulation. Timely surgical intervention may prevent bowel resection at this stage.

Conclusion: In intestinal obstruction, the venous constriction status can be evaluated with pulsed wave Doppler ultrasonography by assessing the RI of blood flow to the intestinal wall. Immediate surgery should be considered if the RI exceeds 0.85 due to strangulated intestinal obstruction.

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