

## PERBANDINGAN MORFOLOGI VESICA FELEA, *CONTRACTILITY INDEX* DAN KETEBALAN *TRIANGULAR CORD SIGN* DALAM PEMERIKSAAN ULTRASONOGRAFI ABDOMEN DUA FASE TERHADAP HASIL KOLANGIOGRAFI INTRAOPERATIF UNTUK DIAGNOSIS ATRESIA BILIER

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### INTISARI

**Latar Belakang:** Atresia bilier (AB) adalah kelainan fibroobliteratif progresif saluran empedu intra dan ekstrahepatik yang menyebabkan kolestasis pada neonatus. Ultrasonografi abdomen dua fase menjadi modalitas awal diagnosis AB di Indonesia.

**Tujuan:** mengetahui perbedaan, nilai *cut-off* dan akurasi diagnostik morfologi vesica felea (VF), *contractility index* (CI), dan ketebalan *triangular cord sign* (TACS) pada ultrasonografi abdomen dua fase terhadap hasil kolangiografi intraoperatif untuk diagnosis AB.

**Metode:** Uji diagnostik analitik observasional dengan desain *cross-sectional* menggunakan data sekunder pasien kolestasis di RS Sardjito (Agustus 2020–September 2024). Sampel diambil secara *consecutive non-random sampling* (n=72).

**Hasil:** Volume VF prepancreal, tipe morfologi VF, *contractility index* dan ketebalan TACS menunjukkan perbedaan bermakna ( $p < 0.05$ ) antara kelompok AB dan non-AB. Volume VF prepancreal (AUC 0,699; *cut-off*  $\leq 142 \text{ mm}^3$ ), *contractility index* (AUC 0,750; *cut-off*  $\leq 71,58\%$ ), dan ketebalan TACS (AUC 0,868; *cut-off*  $\geq 2,03 \text{ mm}$ ) memiliki sensitivitas masing-masing 67,3%, 87,7%, dan 88%, serta spesifisitas 68,1%, 77,3%, dan 77,2%. Morfologi VF tipe III menunjukkan sensitivitas 80% dan spesifisitas 77,3%. Kombinasi parameter tersebut menghasilkan sensitivitas 100% dan spesifisitas 36,3%.

**Kesimpulan:** Parameter ultrasonografi abdomen dua fase berupa volume VF prepancreal  $\leq 142 \text{ mm}^3$ , CI  $\leq 71,58\%$ , ketebalan TACS  $\geq 2,03 \text{ mm}$  dan morfologi vesica felea tipe III dapat mendiagnosis AB. Kombinasi parameter meningkatkan sensitivitas sempurna, sementara ketebalan TACS memberikan performa diagnostik tertinggi. Temuan ini mendukung USG sebagai alat skrining efektif untuk AB sebelum konfirmasi kolangiografi intraoperatif.

**Kata kunci:** atresia bilier, ultrasonografi abdomen dua fase, morfologi vesica felea, *contractility index*, ketebalan TACS

## COMPARISON OF GALLBLADDER MORPHOLOGY, CONTRACTILITY INDEX, AND TRIANGULAR CORD SIGN THICKNESS IN TWO-PHASE ABDOMINAL ULTRASOUND VERSUS INTRAOPERATIVE CHOLANGIOGRAPHY FOR THE DIAGNOSIS OF BILIARY ATRESIA

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### ABSTRACT

**Background:** Biliary atresia (BA) is a progressive fibro-obliterative disorder of the intra- and extrahepatic bile ducts, causing cholestasis in neonates. Two-phase abdominal ultrasound is the initial diagnostic modality for BA in Indonesia.

**Objective:** To determine the differences, cut-off values, and diagnostic accuracy of gallbladder (GB) morphology, contractility index (CI), and triangular cord sign (TACS) thickness in two-phase abdominal ultrasound compared to intraoperative cholangiography for BA diagnosis.

**Methods:** An observational analytic diagnostic test with a cross-sectional design using secondary data from cholestatic infants at Sardjito Hospital (August 2020–September 2024). Consecutive non-random sampling was used (n=72).

**Results:** Preprandial GB volume, GB morphology type, CI, and TACS thickness showed significant differences ( $p < 0.05$ ) between BA and non-BA groups. Preprandial GB volume (AUC 0.699; cut-off  $\leq 142 \text{ mm}^3$ ), CI (AUC 0.750; cut-off  $\leq 71,58\%$ ), and TACS thickness (AUC 0.868; cut-off  $\geq 2.03 \text{ mm}$ ) had sensitivities of 67.3%, 87.7%, and 88%, and specificities of 68.1%, 77.3%, and 77.2%, respectively. Type III GB morphology showed 80% sensitivity and 77.3% specificity. Combined parameters achieved 100% sensitivity dan 36,3% specificity.

**Conclusion:** Two-phase abdominal ultrasound parameters including preprandial GB volume  $\leq 142 \text{ mm}^3$ , CI  $\leq 71,58\%$ , TACS thickness  $\geq 2,03 \text{ mm}$ , and type III GB can diagnose AB. The combination of these parameters yields perfect sensitivity, while TACS thickness demonstrates the highest diagnostic performance. These findings support the use of ultrasound as an effective screening tool for AB prior to confirmation by intraoperative cholangiography.

**Keywords:** biliary atresia, two-phase abdominal ultrasound, gallbladder morphology, contractility index, TACS thickness