ICTERUS IN DOGS

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ICTERUS OBSERVED

Evaluate PCV and/or HCT

Patient anemic?

YES

Evaluate reticulocyte count

Regenerative anemia?

YES

Recheck PCV and/or HCT in 1 to 2 days

LOCALIZATION
Prehepatic icterus

Anemia significant?

YES

Conduct further diagnostic investigation of anemia

See Immune-mediated disease suspected box, next page

See Conduct serum chemistry profile box

NO

Recheck reticulocyte count in 2 days

NO

Anemia progressive?

YES

Recheck PCV and/or HCT to rule out developing anemia

See Liver enzymes elevated box, page 19

NO

Bilirubinuria present?

YES

Perform urinalysis

NO

HCT = hematocrit
PCV = packed cell volume
Evidence of immune-mediated disease (e.g., autoagglutination, spherocytes, positive Coombs test result)?

**IMMUNE-MEDIATED DISEASE SUSPECTED**

**YES**

**DIAGNOSIS**

IMHA

Evidence of underlying disease?
- Consider recent vaccinations, infectious disease, neoplasia

**YES**

**DIAGNOSIS**

Secondary IMHA

**TREATMENT**

Treatment and/or management of underlying disease

**NO**

**DIAGNOSIS**

Primary (idiopathic) IMHA

**TREATMENT**

- Immunosuppressive therapy
- Other supportive medications

**NO**

Possible nonimmune-mediated causes of hemolytic anemia (e.g., toxins, infectious disease, enzymopathies)?

**YES**

Conduct further diagnostic investigation
- Abdominal radiography to rule out zinc foreign body
- Infectious disease testing, particularly serologic or PCR testing for babesiosis
- Genetic testing for congenital enzymopathies (e.g., pyruvate kinase deficiency, phosphofructokinase deficiency)

**NO**

ALP = alkaline phosphatase  
ALT = alanine aminotransferase  
GGT = gamma-glutamyl transpeptidase  
IMHA = immune-mediated hemolytic anemia
Serum chemistry indicators of liver failure (eg, hypoalbuminemia, hypoglycemia, hypocholesterolemia, low BUN)?

**LIVER ENZYMES ELEVATED**

Serum chemistry indicators of cholestasis** (eg, hypocholesterolemia, elevated GGT)?

**DIAGNOSIS**

Suspected hepatocellular failure

**LOCALIZATION**

Suspected intrahepatic cause of icterus

Evaluate blood ammonia level*

**ELEVATED**

**DIAGNOSIS**

Suspected concurrent hepatic encephalopathy

**TREATMENT**

- Antibiotics
- Lactulose

**ABNORMAL**

**TREATMENT**

Administration of plasma

- Consider toxin exposure and/or infectious disease
- Check leptospirosis titers

**NORMAL**

Perform coagulation profile

**LOCALIZATION**

Suspected extrahepatic cause of icterus

Conduct further diagnostic investigation for extrahepatic cholestasis
- Ultrasonography
- Biliary aspiration
- Surgical exploration to evaluate hepatobiliary tract
- Liver biopsy

**ELEVATED**

**TREATMENT**

- Antibiotics
- Lactulose

**ABNORMAL**

Perform abdominal ultrasonography

Evidence of extrahepatic biliary disease (eg, mucocele, cholelithiasis, bile duct dilation, gall bladder wall changes)?

**LOCALIZATION**

Suspected extrahepatic cause of icterus

ALP >2 times ALT value?

**YES**

Perform liver biopsy (ultrasound-guided, laparoscopic, or laparotomy)

**NO**

Proceed as determined by gross and histopathologic findings

**NORMAL**

TREATMENT

Administration of plasma

*Clinicians should reference their laboratory’s reference range when determining whether a value may be elevated, as reference ranges can vary between laboratories.

**Hypercholesterolemia should only be considered significant if the patient has been fasted for 8 hours prior to sample collection.*