Icterus in Dogs

Icterus is also known as jaundice or yellow jaundice. It means that a yellow pigment is found in the blood and in the tissues. It is most easily seen in the gums, the sclerae (white part of the eyes), and the pinnae (ear flaps). However, if these tissues normally have a dark colour, icterus will probably not be seen.

Causes/Transmission

The causes of icterus fall into three major categories:

1. Destruction of red blood cells. This can occur within blood vessels (intravascular) or in the spleen and liver (extravascular). The process of red cell destruction is known as haemolysis.

2. Liver disease. Any disease that causes destruction of liver cells or causes bile to become trapped in the liver can cause icterus.

3. Obstruction of the bile duct. The bile duct carries an important fluid for digestion (bile) from the gall bladder to the small intestine. Obstruction can occur within the gall bladder or anywhere along the bile duct.

Clinical Signs

Regardless of the underlying cause, dogs with icterus are often weak and depressed. If the dog is very anaemic, these signs may be even more pronounced. In addition to the yellow colour of the skin, the urine often is dark yellow. In a rare instance, the bile duct is completely obstructed and the dog’s faeces will appear pale gray or whitish in colour.

Diagnosis

Within each category listed above are several possible causes. Determining the cause of icterus requires a series of tests. Some of these tests determine which category is involved. Once that is known, other tests are done to look for a specific disease that is leading to the icteric state.

1. Haemolysis Haemolysis can be caused by toxic plants (ie onions), chemicals, drugs, parasites on the red blood cells, heartworms, autoimmune diseases, and cancer. Several tests are needed to determine which of these is the cause.

Since haemolysis results in red blood cell destruction, determination of red blood cell numbers is one of the first tests performed on the icteric patient. There are three tests that may be used for this. The red blood cell count is an actual machine count of red blood cells. The packed cell volume (PCV) is a centrifuge-performed test that separates the red blood cells from the serum or plasma (the liquid parts of the blood). The haematocrit is another way to determine if there is a reduced number of red blood cells. All three of these tests are part of a complete blood count (CBC).

2. Liver Disease The most common causes of liver disease include bacterial infections, viral infections, toxic plants, chemicals, or drugs, cancer, autoimmune diseases, and certain breed-specific liver diseases.

A chemistry profile is performed on dogs with icterus. This is a group of 20-30 tests that are performed on a blood sample. The chemistry profile contains several tests that are specific for liver disease. The main ones are the ALT, AST, ALP, and total bilirubin. If these tests are normal, and there is reason to suspect liver disease, a bile acid analysis is performed.

Although these all look at the liver from a slightly different perspective, ultimately they only determine that liver disease is occurring. None of them are able to determine the exact cause of the disease. To make that determination, a biopsy of the liver is necessary. This can be done in three ways.
A. Fine-needle aspirate or biopsy. To perform this procedure, a small gauge needle is inserted through the skin into the liver. A syringe is used to aspirate some cells from the liver. The cells are placed on a glass slide, stained, and studied under a microscope. This is the least invasive and quickest test, but it has certain limitations. Because only a few cells are obtained, it is possible that a representative sample from the liver will not be obtained. It is also not possible to view the cells in their normal relationship to each other (i.e., tissue architecture). Some diseases can be diagnosed with this technique, and others cannot.

B. Needle biopsy. This procedure is similar to the fine-needle aspirate except a much larger needle is used. This needle is able to recover a core of tissue, not just a few cells. The sample is fixed in formaldehyde and submitted to a pathologist for analysis. General anaesthesia is required, but the dog is anaesthetised for only a very short period of time. If it is done properly and with a little luck, this procedure will recover a very meaningful sample. However, the veterinarian cannot choose the exact site of the liver to biopsy because the liver is not visible. Therefore, it is still possible to miss the abnormal tissue.

C. Surgical wedge biopsy. The dog is placed under general anaesthesia, and the abdomen is opened surgically. This permits direct visualisation of the liver so the exact site for biopsy can be chosen. A piece of the liver is surgically removed using a scalpel. This approach gives the most reliable biopsy sample, but the stress of surgery and the expense are the greatest of all of the biopsy methods. Bleeding from the biopsy site is a potential complication from this procedure so coagulation tests are often performed prior to needle biopsy or surgical biopsy.

3. Obstruction of the bile duct. Obstruction of the bile duct may occur as a consequence of pancreatitis (inflammation of the pancreas), cancer, trauma to the abdomen, thickened bile that is sludged in the bile duct, or a stricture of the bile duct.

Important tests for diagnosis of these disorders include a CBC, chemistry profile, abdominal x-rays, abdominal ultrasound, and specific tests for pancreatitis.

Treatment
General supportive care for liver disease often includes intravenous fluid therapy and antibiotics. Additional treatment is dictated by the underlying cause of the icterus.

Prognosis
Prognosis is dependent upon identification and successful treatment of the underlying cause.
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B. **Needle biopsy.** This procedure is similar to the fine-needle aspirate except a much larger needle is used. This needle is able to recover a core of tissue, not just a few cells. For patient comfort and accurate sampling, a short acting general anaesthetic or sedative is usually required.

C. **Surgical wedge biopsy.** The dog is placed under general anaesthesia, and the abdomen is opened surgically. This permits direct visualisation of the liver so the exact site for biopsy can be chosen. A piece of the liver is surgically removed using a scalpel. This approach gives the most reliable biopsy sample, but the stress of surgery and the expense are the greatest of all of the biopsy methods. Bleeding from the biopsy site is a potential complication from this procedure so coagulation tests are often performed prior to needle biopsy or surgical biopsy.

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