
LIVER ULTRASONOGRAPHY OF HEALTHY YELLOW-LEGGED GULL

Lora KOENHEMSI

Istanbul University, Faculty of Veterinary Medicine, Department of Internal Medicine, Avcılar

ABSTRACT

In birds with hepatic disorders, clinical signs are usually unspecific. Therefore, it is essential to perform further investigations for diagnosis. Ultrasonography (US) is a non-invasive, painless and relatively easy to perform method both in humans and animals. Ultrasonography uses the transmission and reflection of soundwaves to produce an image. Organ visualization in the avian patient is limited when compared to mammalian species, as the ultrasound waves cannot penetrate the gas-filled air sac system. Thirteen adult and seven young Yellow-legged Gulls from were included to the study. Gulls were not receiving any medicine at the time of the ultrasonography. Birds were not sedated for US examination. US was performed with a SIUI Apogee 3500V doppler ultrasound machine. Alcohol and an acoustic gel was applied to the skin. US performed with the birds in dorsal recumbency. All US examinations were performed by the same person. Normal place of the liver was detected in the Yellow-legged Gulls and normal appearance was noted. No abnormal areas was detected in the liver. Further studies are warrant for better understanding the usage and normal ultrasonographic views in different kind of birds

Keywords: Yellow-legged Gull, Liver, Ultrasonography

1. INTRODUCTION

The yellow-legged gull (*Larus michahellis*) is a large gull spreaded in Europe, the Middle East and North Africa. The species name "michahellis" is given to honour the German zoologist Karl Michahelles. Their total length is between 55-67 cm, wingspan 137-142 and weight is between 750-1200g. Their breeding range is mostly around Mediterranean Sea. The young ones have paler head, dark eyes and bill, grey legs and darker wing feathers. They are omnivors, feed with fish, invertebrates, reptilians, little mammalians, trash, eggs and other birds' chicks. They live around rocky islands, lagoons, deltas and cities. In cities, they usually prefer to nest on rooftops and spend time around rubbish tips and harbours (Oiseaux). Improper nutrition due to their obligatory adaptation of the city life might cause various damages on seagull's liver. Those damages are almost always subclinical. So that the identification of the disease is important.

Liver disease is one of the important cause of morbidity and mortality in birds. Infectious agents (viral, bacterial, parasite, and fungal), tumour, and metabolic abnormalities are the common causes. In birds with hepatic disorders, clinical signs are usually unspecific. Lethargy, anorexia, biliverdinuria (green or yellow color in the feces), coelomic enlargement, and dyspnea due to hepatomegaly and ascites are the main clinical symptoms. Common biochemical abnormalities are increased plasma concentrations of aspartate transaminase, lactate dehydrogenase, and bile acids (Nordberg et al., 2000). However large differences can be detected between birds in the

analysis of plasma enzymes (Krautwald-Junghanns et al., 2001). Therefore, it is essential to perform further investigations for diagnosis.

Ultrasonography (US) is non-invasive, painless and relatively easy to perform method both in humans and animals. Ultrasonography uses the transmission and reflection of soundwaves to produce an image. Organ visualization in the avian patient is limited when compared to mammalian species, as the ultrasound waves cannot penetrate the gas-filled air sac system (Helmer, 2003). The aim of this study was to develop techniques for hepatic ultrasonography and describe the normal sonographic appearance of the liver in Yellow legged gulls.

2.MATERIALS & METHODS

Thirteen adult and seven young Yellow-legged Gulls were included to the study. Gulls were not receiving any medicine at the time of the ultrasonography and were fasted 6 hours before the examinations. Birds were not sedated for US examination. Feathers of the birds were not plucked, only parting the feathers in the examination area was sufficient. US performed with the birds in dorsal recumbency. The head and the legs are held by an assistant (Figure 1). Alcohol and an acoustic gel was applied to the skin. All US examination were performed by the same person. US was performed with a SIUI Apogee 3500V doppler ultrasound machine and 10 MHz sector transducer.

The paraxiphoid window was selected for the visualization of the liver. The transducer was angled slightly off midline that the heart could be seen in the deep field behind the liver. The depth of the liver was maximized. The transducer was swept right to left in the sagittal plane for the evaluation of the entire hepatic structures. To obtain a better view the transducer is slightly angled dorsally.

3.RESULTS

The liver parenchyma was seen in all birds in the US. Normal place of the liver which is ventral and caudal to the heart was detected in the Yellow-legged Gulls and normal appearance is noted. The normal sonographic parenchymal structure is homogenous and no abnormal areas was detected in the liver. The appearance of the liver parenchyma was similar to the mammalian's. Hepatic vessels and gallbladder can be seen as anechoic structures. Gallbladder detected on the caudal right lobe. Gallbladder shape is round or oval-shaped with a distinct echogenic wall and the content is anechoic (Figure 2a and 2b). Liver dimensions are not leap the caudal end of the sternum. Fluid in the peritoneal cavity is not detected. Difficulties in imaging were encountered due to the air sacs (Figure 3).

4.DISCUSSION

This study has done to describe the normal hepatic US technique in Yellow legged gulls. Birds hide the signs of illness for as long as possible further more, once the symptoms apparent, they deteriorate very quickly. For this reason when a sick bird is presented to the clinics, the diagnosis must be made as soon as possible. A definitive diagnosis can be made typically with a history,

visual and physical examination, blood tests and diagnostic imaging (x-ray, US, endoscopy, MRI or CT) (Grunkemeyer, 2010).

US is a valuable tool in the diagnosis of the hepatic disease in human and mammals because changes in the liver parenchyma can be detected (Jaensch, 2000). Also, the gallbladder can be easily separated from the liver tissue by ultrasonography (Krautwald-Junghanns et al., 2001). However ultrasonography of avian species are difficult due to the small size of the most animals and the acoustic interference of the abdominal air sacs (Grunkemeyer, 2010). In addition birds lack a diaphragm that thoracic and abdominal portions are not distinct (Nordberg et al., 2000).

The ultrasonographic appearance of the liver in this study was similar to other birds. One of the main distinction was many psittacine birds didn't have gallbladders however Gulls had (Nordberg et al., 2000).

Similar to the previously reported studies, the birds were examined without anesthesia (Grunkemeyer, 2010). According to researchers raising the cranial region of the animal by 30 degrees helps better visualization of the organs (Helmer, 2003; Nordberg et al., 2000). In this study, the animal was examined easily on a flat table. The ease of ultrasonographic imaging of the liver in this position is attributed to the size of the seagulls compared to other birds.

The birds were fasted before ultrasonographic examinations because visibility of the organs improves if ultrasound is performed with an empty gastrointestinal tract (Helmer, 2003; Jaensch, 2000). Plucking of feathers was not necessary, only parting was done because the transducer was placed directly behind the sternum so as to utilize the natural featherless area in that region.

In a study with pigeons, the researchers determined that the visibility of the organs in diseased birds was better than the healthy ones. Organ enlargement and their compression on air sacs were the reason of this situation (Pees et al., 2006). In addition image clarity may be increased by the presence of ascites in the hepatic diseases (Grunkemeyer, 2010).

Ultrasonography can be used in the assessment of the liver parenchyma and structures. It might serve as an important clinical diagnostic tool for Yellow legged gulls with hepatic diseases.



Figure 1: Ultrasonographic examinations of the gulls

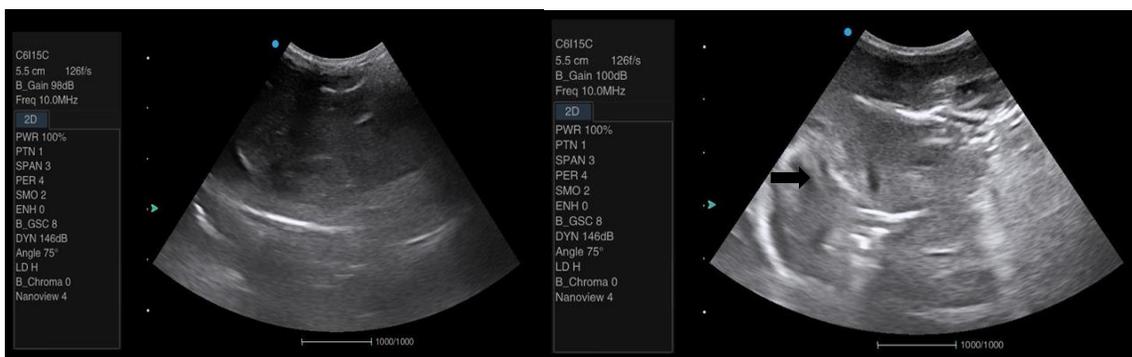


Figure2: Ultrasonographic image of the Yellow legged-gulls, 2a, 2b: Normal appearance of the liver, arrow, gallbladder



Figure3: Poor visualization due to air sacs.

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