

## Prevalence of Gastritis and Enteritis in Red-Eared Turtles Diagnosed by Radiology

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### Abstract

**Objective:** Recently, Red-Eared turtles are kept as pets in Iranian houses; however, because of lack of knowledge about their caring, they are in risk of lots of diseases. Turtles of all ages should be fed with a diet that contains a wide variety of both animal and plant based items but they are usually fed by one item diet which may make gastrointestinal (GI) sickness. They are also several bacterial and viral diseases which interfere with the GI system. These facts have made the turtles very susceptible to Enteritis and Gastritis. Radiography can be a good technique to diagnosis these abnormalities.

**Design:** Retrospective study

**Animals:** A total of 22 Red-Eared turtles have been referred to the Veterinary Radiology Department of University of Tehran to be evaluated for their GI system.

**Procedure:** Lateral and dorsoventral (DV) radiographs were taken from their whole body.

**Results and Conclusion:** On the DV radiographs of 13 turtles, an annular-shaped radiolucency was visible in the left half of the plastron where the stomach is located. Accumulation of gas in the stomach is a typical finding for gastritis. Therefore, the prevalence of gastritis in the cases was 15.2 %; on the DV radiograph of 9 cases, gas in the celomic cavity and gaseous distention of the intestines were detectable which are good signs for enteritis diagnosis in turtles. Therefore, the prevalence of enteritis, diagnosed by radiology, in the referred cases was 10.5%.

**Clinical Relevance:** The study revealed that the prevalence of GI system involvement detectable by radiology in Red-Eared turtles is high and it must be taken into consideration of the owners.

**Key words:** Gastritis, Enteritis, Red-Eared Turtle, Radiology

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## Introduction

Red-Eared turtles (*Trachemys scripta elegans*) are semi-aquatic, omnivorous turtles. They are one of the most frequently encountered chelonians in clinical practice in Iran. One of the more common presenting complaints of their owners is GI diseases. Some causes of GI diseases in reptilian are reported as degenerative, anatomic, metabolic, nutritional, inflammatory, and toxic factors.<sup>1</sup> Wide range of diseases affect GI tract of chelonian; stomatitis, parasites, foreign bodies, bacterial and fungal enteritis are the major conditions encountered in private practice. These facts have made the turtles very susceptible to enteritis and gastritis. Radiology is the most simple and available and important tool to diagnosis of GI diseases of turtles in Iran. In addition to clinical findings, in radiographic studies; accumulation of gas in the stomach is a typical finding for gastritis.<sup>2</sup> Gaseous distention of the intestines was also characterized as a good sign for enteritis.<sup>2</sup>

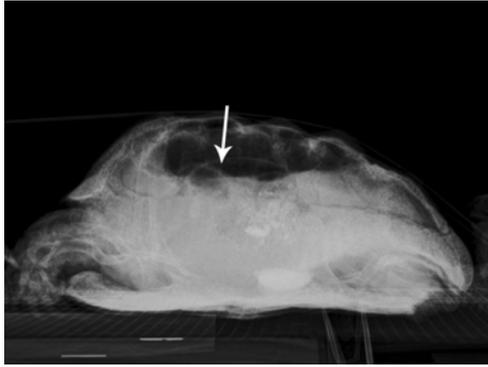
The objective of this study is detecting the prevalence of gastritis and enteritis in Red-Eared turtles diagnosed by radiology in the patients which were referred to Small Animal Hospital of University of Tehran.

## Materials and Methods

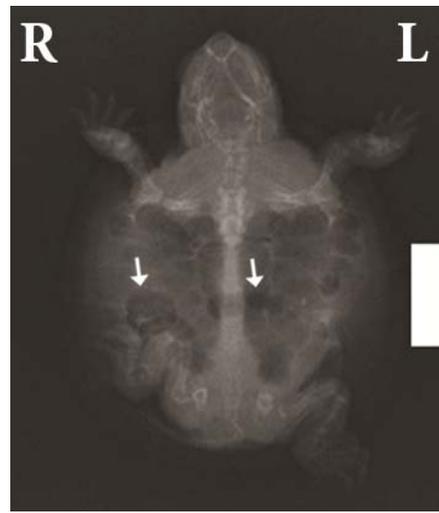
Within eight months a total of 85 Red-Eared turtles have been referred to the Small Animal Hospital of University of Tehran. A total of 22 cases had weighing about 300-500g with signs of anorexia, weight loss, regurgitation, diarrhea and failure to thrive were referred to Radiology Department of this hospital to be evaluated for their GI system. Lateral and DV radiographs were taken from their whole body. The DV radiograph was easily taken by placing the turtle on the cassette. In the lateral view, a horizontal beam was used and the turtle was elevated by using a round container which fit under the plastron. The radiographs were assessed with two radiologists subjectively.

## Results

In DV radiographs of 13 turtles, an angular-shaped radiolucency was seen in the left half of the plastron where the stomach was located and in their lateral radiographs, globular gas-filled stomach was seen (Fig. 1). These observations were considered as gastritis.<sup>2</sup> so; the prevalence of gastritis detected by radiology in these cases was 15.2 %. In lateral and DV (Fig. 2) radiographs of 9 cases, gaseous distension appearance of the intestines were seen which describes enteritis; therefore, the prevalence of enteritis, diagnosed by radiology, in the referred cases were 10.5%.



**Figure 1-** Lateral view which shows gastritis. Globular gas-filled stomach is marked.



**Figure 2-** Dorsoventral view which shows enteritis. Gaseous distension appearance of the intestines is marked.

## Discussion

In other studies it is reported that chelonian are inquisitive and will gnaw on objects; they are known to ingest rocks, bits of food, and other indigestible objects. It is not uncommon to radiograph of a turtle or tortoise and find that the entire colon is full of substrate from the enclosure.<sup>1</sup> Also volvulus of the proximal colon has been described in marine chelonian caused by foreign bodies.<sup>3</sup> These are as anatomic factors of GI diseases that diagnosis of them relies on the use of imaging modalities.<sup>4</sup> Radiography is the single most widely available imaging modality in veterinary.<sup>1</sup> In reptiles contrast radiography have been investigated in anatomic lesions of gastrointestinal system.<sup>5</sup> The use of gastrointestinal contrast studies can help to differentiate between intestinal and extra-intestinal diseases. These techniques can also help to distinguish between intraluminal ( e.g. radiolucent foreign bodies ), intestinal ( e.g. abscessation, neoplasia ) and extraluminal diseases, and aid in the diagnosis of gastrointestinal perforation.<sup>6</sup> In another study, nutritional enteritis due to low fiber diet is reported in tortoises.<sup>7</sup> Penninck used ultrasonography in diagnosis of GI tract disorder in California desert tortoise ( *Xerobates agassizie* ).<sup>8</sup> Rosenthal used computed tomography as a diagnostic aid in the diagnosis of an abdominal mass in a box turtle.<sup>9</sup>

According to the past studies and lack of facilities in Iran in diagnosis of turtles diseases and also high accuracy of radiology to diagnose enteritis and gastritis in turtles, we selected radiology to diagnose GI diseases in turtles. Our study revealed that the prevalence of GI system involvement detectable by radiology in Red-Eared turtles is high and turtle's owners must pay attention to it. In this survey turtles which were suspected to gastritis and enteritis underwent specific treatment for these diseases. By improving nutrition qualification and changing husbandry situation, the turtles were better.

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## میزان شیوع گاستریت و انتریت قابل شناسایی بوسیله رادیولوژی در لاک پشت گوش قرمز

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**هدف** - امروزه نگهداری لاکپشت های گوش قرمز به عنوان حیوانات خانگی خصوصا در ایران رواج پیدا کرده است، اما بدلیل عدم آگاهی کافی از جیره ی اصلی و شرایط نگهداری ؛ این حیوانات به بیماری های گوناگونی بویژه بیماری های معده ای - روده ای مبتلا می شوند. همچنین باکتری ها و ویروس هایی وجود دارند که دستگاه گوارش این لاکپشت ها را مورد حمله قرار می دهند و باعث بیماری های گوارشی می گردند. رادیولوژی روشی مناسب برای تشخیص این اختلالات در لاکپشت ها می باشد.

**طرح مطالعه** - گذشته نگر

**حیوانات** - تعداد ۲۲ لاکپشت گوش قرمز که برای بررسی دستگاه گوارش به بخش رادیولوژی بیمارستان دانشکده دامپزشکی دانشگاه تهران ارجاع داده شدند.

**روش کار** - رادیوگراف های پشتی- شکمی و جانبی از این حیوانات تهیه گردید و جهت بررسی عوارض گوارشی مورد بررسی قرار گرفت.

**نتایج و نتیجه گیری** - در رادیوگراف های پشتی- شکمی ۱۳ لاکپشت، رادیولوسنسی زاویه دار در نیمه ی چپ پلاسترون مشاهده گردید که این ناحیه محل قرار گیری معده در این حیوانات می باشد. تجمع گاز در معده یافته ی بارز گاستریت است. در نتیجه میزان شیوع در این موارد ۱۵/۲٪ محاسبه گردید. در رادیوگراف پشتی- شکمی در ۹ بیمار گاز در محوطه ی سلومی و اتساع گازتوز روده ها که نشانه ی انتریت در لاکپشت ها می باشد مشاهده شد. میزان شیوع انتریت در این بیماران ۱۰/۵٪ تعیین گردید.

**یافته بالینی** - این مطالعه نشان داد که میزان درگیری گوارشی قابل شناسایی به روش رادیوگرافی در لاکپشت های گوش قرمز بالا می باشد و این امر باید مورد توجه صاحبان این بیماران قرار گیرد.

**کلید واژگان** - لاکپشت گوش قرمز، گاستریت، انتریت، رادیولوژی.

