

Pathological Examination of a Raccoon Dog Introduced to the Akasaka Imperial Gardens, Tokyo, Japan

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遠藤秀紀¹⁾・林田明子²⁾・上塚浩司³⁾:
赤坂御用地に移入されたタヌキの病理解剖学的検討

Introduction

The raccoon dog, *Nyctereutes procyonoides*, has been adapted not only for the woods and forests, but also for the farming village and city area, and artificially introduced to various regions far from the original localities (Ikeda, 1986; Walker, 1991a, 1991b; Yoneda, 1994; Shibata, 1996; Torii, 1996). The Akasaka Imperial Gardens (Minato Ward, Tokyo) has largely contained woods and forests in the center of Tokyo City, and some raccoon dogs have been seen in the gardens since about 1990. It is thought that the species has been installed within the Akasaka Imperial Gardens to be adapted for the isolated natural environment. However, the origin and the reproductive status have remained unclear. So, we had intention to collect the dead body of this species to undertake the macroscopic and pathological checks in the raccoon dogs from the Akasaka Imperial Gardens.

Materials and Methods

We could obtain a carcass of the raccoon dog in 20th November 2003. The carcass was found by H. I. H. Prince Akishino at the north side of Ohike pond. The carcass was frozen once, and after melting the body, we carried out the macroscopic pathological examination of this carcass by naked eyes.

Results

Head and body length was 490 mm, tail length 55 mm, length of hindfoot 104 mm and ear length 47 mm in this individual. Sex was male. The weights of each organ are shown in Table 1.

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Fig. 1. The carcass of the raccoon dog found in the north area of Ohike Pond in November 20, 2003.
Fig. 2. Skin was partially picked in the dorsal area of the cervical part (arrows).

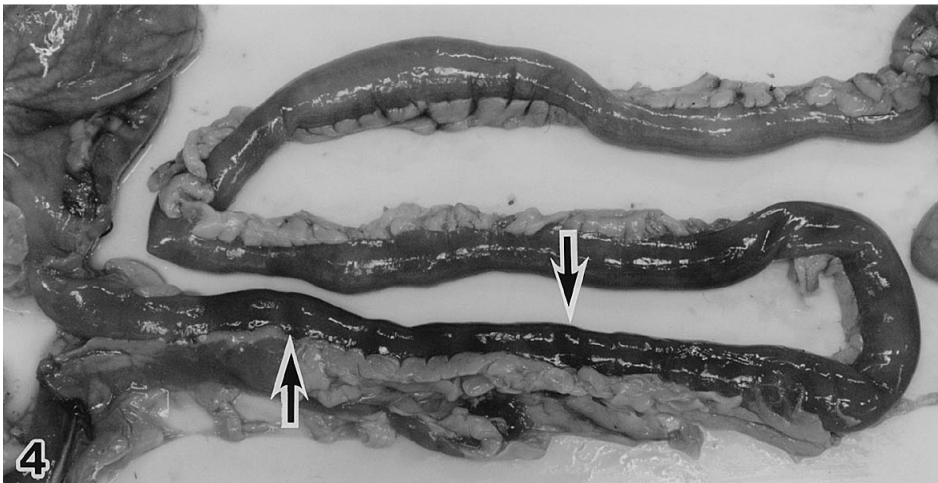


Fig. 3. The alimentary tract of the individual. S, dissected stomach ; D, duodenum ; J, jejunum ; I, ileum ; E, cecum ; O, colon ; R, rectum.

Fig. 4. The hemorrhagic duodenitis is obviously seen (arrows).

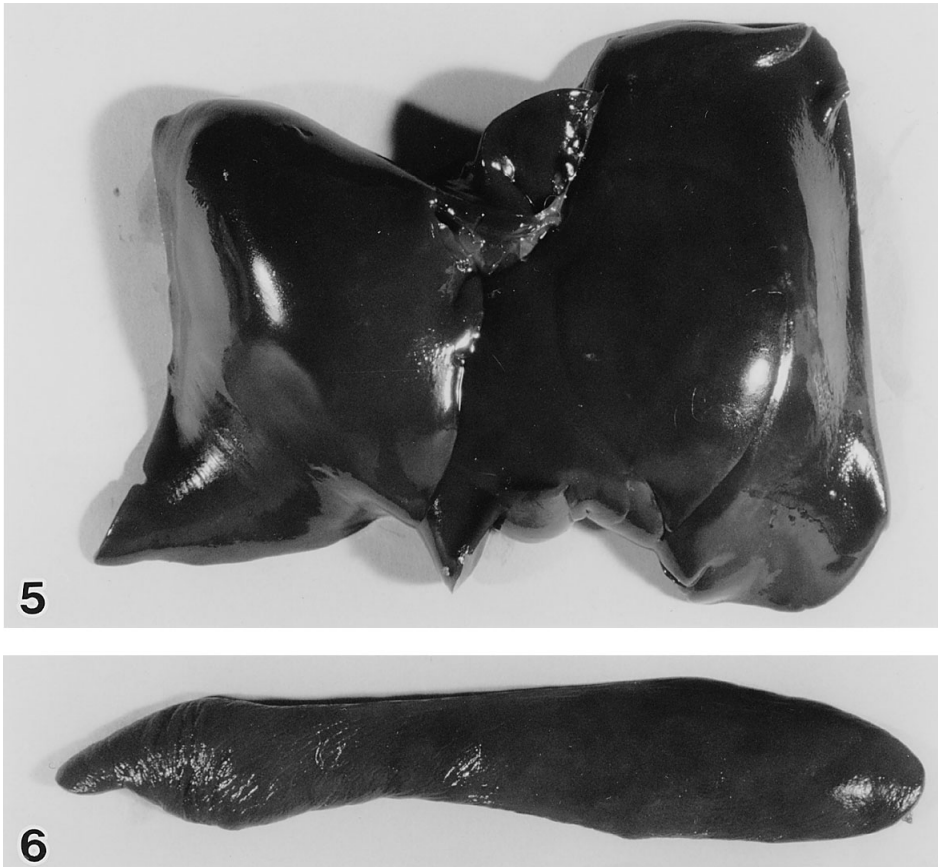


Fig. 5. Diaphragmatic aspect of the liver. Dorsal direction at the top.

Fig. 6. The spleen. Any pathological abnormality is not seen.

Table 1. Weight (g) of each organ of the raccoon dog used in this study.

Stomach	47.8
From duodenum to ileum	108.7
From cecum to rectum	32.3
Esophagus	7.7
Spleen	10.6
Liver	137.7
Left kidney	18.9
Raight kidney	17.9
Heart	22.5
Lung	51.6
Bladder	3.2
Left testis	1.2
Right testis	2.0

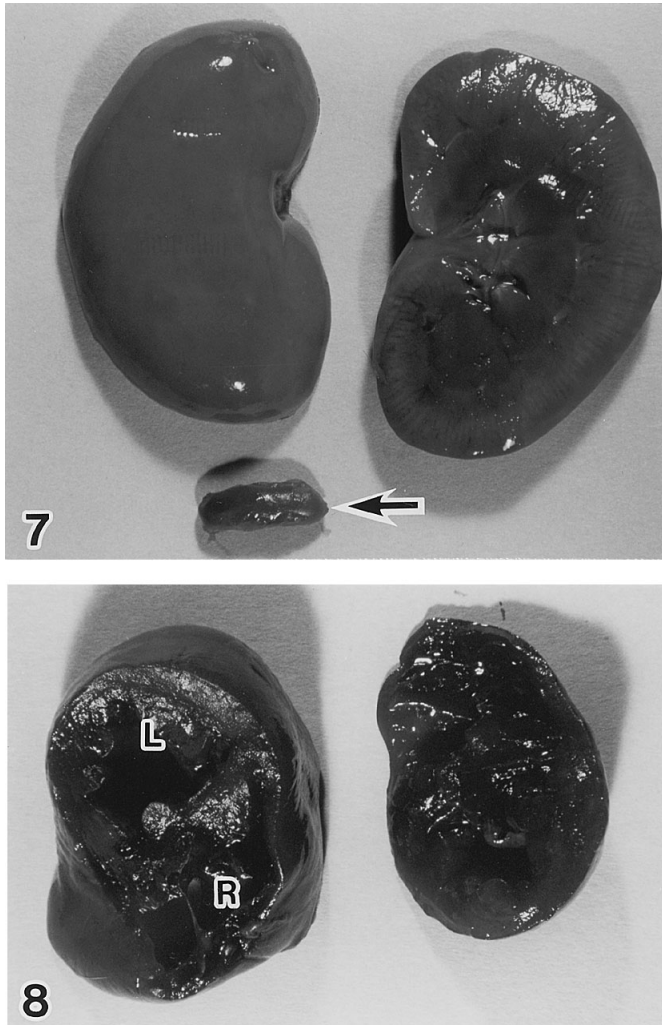


Fig. 7. Left, left kidney. Right, right kidney showing the longitudinal section. Arrow indicates the left adrenal gland.

Fig. 8. The heart has been separated into the dorsal (left) and ventral (right) parts. L, left ventricle ; R, right ventricle. The wall of both ventricles becomes thinner.

The lateral aspect of the carcass is shown (Fig. 1). Dorsal part of the cervical area might be picked by some scavenger birds (Fig. 2). The skin was not flesh, so we renounced the preparation of the skin specimen from the body.

We did not observe the major pathological abnormalities in each organ in the visceral and thoracic cavity. The ascites and the peritonitis were not found. In the alimentary tract, however, the considerable erythrochromia was discerned in the duodenum area, while we could not find any pathological damages in esophagus, jejunum, ileum, cecum, colon and rectum (Figs. 3 and 4). The pathological damage was so heavy in the duodenum. In some areas of the duodenum, the hemorrhagic inflammation was observed (Fig. 4).



Fig. 9. Dorsal aspect of the lung. Any pathological abnormality is not seen. Cranial direction at the top.

The liver, spleen, kidney and adrenal gland are shown (Figs. 5–7). The pathological abnormalities have not been observed in these organs. The fibrous capsula, the renal cortex, and outer and inner zones of the renal medulla did not show any inflammatory change in the kidney (Fig. 7).

In the thoracic area, the pleurisy and the abnormalities of diaphragm were not discerned. However, the hypercardia of the left and right ventricles was distinguishable in the heart (Fig. 8). The wall became thinner than that in the ventricle of normal individuals. Each lobe of the lung did not show any pathological change (Fig. 9).

Discussion

The cause of death could not be confirmed in this individual, since we suggest that the animal appeared healthy from the pathological findings. However, the hemorrhagic duodenitis and hypercardia were obviously seen. We did not deny these two factors may cause the death of the individual. We suggest that the skin damages may be due to the jungle crow, a common scavenger bird in the Akasaka Area.

The existence of the raccoon dog within the Akasaka Imperial Gardens was supported only by some witness cases. In Tokyo Metropolitan Area, the witness cases of the raccoon dogs have been more constantly reported than those of the masked palm civet (Kanai, 1991). It was demonstrated that the population has been maintained in Hachiouji, Hino, and Machida Towns. Furthermore some cases of witness have also occurred in Nerima, Suginami and Setagaya Wards. From the studies on the home range (Yamamoto, 1995; Kaneko *et al.*, 1998), we suggest that the Akasaka Imperial Gardens may be adequate to the maintenance of the raccoon dog.

The origin of the Akasaka population of the raccoon dog has remained unclear. There are the two

following possibilities. 1) Artificial introduction originated from the captive animals. 2) Migration from the naturally distributed areas such as Itsukaichi, Okutama, and the other areas of the west districts of Tokyo. We can obtain the genetic samples from this individual carcass. In the present study. The DNA sequence data of the raccoon dog in Japan will be published in the future, and we will discuss the origin of the population from the comparison of the mitochondrial DNA sequence data.

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要 約

赤坂御所においてタヌキの死亡個体を収集，病理学的検討を加えたので報告する。収集されたタヌキは死後5日から1週間程度経過したものと推察され，毛皮の鮮度は落ちていて標本化は困難であった。頸部背側に皮膚から筋層に達する大きな損壊が見られた。おそらくハシブトガラスによる食害痕と思われる。腹腔，胸腔に腹水，胸水の貯留は見られず，腹腔内壁，胸腔内壁に，炎症などの病変は見られなかった。消化管は全体に正常であったが，十二指腸部に顕著な赤変部が確認された。比較的重い出血性炎症を起こしていたものと推察される。肝臓，脾臓には病変は見られず，腎臓は断面からの観察でもきれいな三層構造を維持し，漿膜面下の状態にも異常はなかった。胸腔では心臓において左右両心室に拡張が生じ，心室壁が薄く変化していた。肺は各葉とも正常だった。このように，全身症状を推察されるような病理学的所見は見られず，直接の死因が確定できるものではなかった。しかし，十二指腸と心臓の病変は無視できるものではなく，この両臓器の変化が個体の健康状態に影響を与えた可能性は指摘できる。今後本個体から得られた遺伝学的材料から，赤坂集団の起原が確認されよう。

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