



Species: Canine	Breed: Mastiff/Staffie Cross	Pathology Lab No: [REDACTED]
Age: ~ 1 year	Sex: Female	RETAIN FOR EVIDENCE
Owner: [REDACTED] Exhibit: / TagNo: [REDACTED] Replacement-TagNo.:		Previous Path Lab No(s):
Animal Name/Ref: [REDACTED]		Pathologist(s): NS Typed: SH
Referring Veterinary Surgeon: [REDACTED]	Report & Invoice to: [REDACTED]	Date received: 02/07/14 Date of necropsy: 04/07/14 Photographs: Yes The fee for this post mortem consultation is: [REDACTED] [REDACTED]
Interval between death & necropsy: Less than 24/36 hours prior to freezing		Bodyweight: 23 kg
Clinical Features: Need to determine whether dog was alive at the time it was hung for the purpose of the prosecution evidence. Could the examining vet please contact Inspector [REDACTED] as soon as this is determined?		

On 02/07/14, at approximately 15.45pm, [REDACTED] delivered the body of a dog [REDACTED] to [REDACTED]. The animal was accepted by [REDACTED], Technician. The carcass was delivered frozen in a yellow bag sealed with [REDACTED] Tag No. [REDACTED] but opened on a side (Fig.1B), contained in a larger red bag sealed with [REDACTED] Tag No. [REDACTED] (Fig.1A). Necropsy was performed by *Name Surname*, DVM, DipIECVP, PhD, MRCVS Lecturer in Veterinary Pathology between 15:00 and 17:45 on 04/07/14.

GROSS FINDINGS

External examination

Signs of death: The carcass was at room temperature and *rigor mortis* was not present. The eyes were exhibiting mild corneal opacity and intravascular blood coagulation was present.

Carcass (Fig. 2, 3): There was abundant subcutaneous and intra-abdominal adipose tissue and the muscle bulk was well represented. The animal was in good care condition.

Skin (Fig. 2, 4, 12, 24): The animal was wearing a partially rusted, metal choke chain, circumferentially surrounding the neck. The skin under the chain within the ventral portion of the neck exhibited multifocal areas of reddening and the fur was multifocally soiled by orange light brown dust (rust). There was a diffuse moderate reddening on the skin on the head and the abdomen including mammary glands and hindlimbs, in contrast with skin on the thorax. Footpads of the hindlimbs exhibited bilaterally a ~1 cm in diameter focal erosion. The nails of the hindlimbs were bilaterally and markedly worn.

Subcutis (Fig. 4, 13, 14, 15, 16): There was moderate diffuse reddening within the subcutis of the face, abdomen, and hindlimbs. Veins of the subcutis on the face, close to the ears and the larynx were markedly enlarged and full of blood (congestion).

A single 2x2 cm in diameter reddened area was detected close to the ventral portion of the left region of the thigh. Abundant adipose tissue was present.



Internal examination

Nasal cavity (Fig. 18): A moderate amount of blood was detected within the nasal cavity. Soft tissues surrounding the nasal cavity were moderately to markedly reddened.

Cranial cavity (Fig. 7): No abnormality was detected.

Oral cavity (Fig. 5): Diffuse moderate hyperaemia of oral mucosa was detected. No further abnormality was detected.

Thoracic cavity (Fig. 6): No abnormality was detected.

Abdominal cavity (Fig. 6): All the abdominal organs were markedly reddened (congestion) in a decreased order of severity: kidneys, pancreas, uterus, urinary bladder, small intestine. No further abnormality was detected.

Pelvic cavity (Fig. 6): No abnormality was detected.

Muscular system: No abnormality was detected.

Skeletal system (Fig. 19, 20, 21, 26): The joint between C6 and C7 was easily movable compared with the other joints on the cervical spinal cord (consistent with subluxation/luxation). The cervical spinal canal contained a moderate amount of blood.

After longitudinal sectioning with diamond saw of the vertebral column between C1 and T3, no fractures were detected. An increased laxity was confirmed between C6 and C7 without evidence of fractures.

Nervous system

Brain (Fig. 7): A moderate diffuse reddening of the meninges was recognised.

Spinal cord (Fig. 20, 21): Surrounding the spinal cord extending between C1 and T1, a moderate amount of blood was recognised.

PNS: No abnormality was detected.

Cardiovascular system

Pericardium (Fig. 9): No abnormality was detected.

Heart (Fig. 9): No abnormality was detected.

Respiratory system

Larynx (Fig. 9, 17): A moderate amount of blood was detected under the epiglottis. Within the lumen of the larynx a moderate amount of blood mixed with foamy fluid was detected.

Trachea (Fig. 9): Abundant frothy red fluid was detected (lung oedema and haemorrhage).

Bronchi (Fig. 9): Abundant frothy red fluid was detected (lung oedema and haemorrhage).

Lungs (Fig. 9): Multifocal dark red areas, bilaterally within caudal lobes were detected (oedema and congestion/haemorrhage).



Gastrointestinal tract

Pharynx (Fig. 9): No abnormality was detected.

Oesophagus (Fig. 9): No abnormality was detected.

Stomach (Fig. 11): The organ was diffusely reddened (congestion). Abundant partially solid material and plastic bag fragments were present inside the stomach. No abnormality was detected.

Small intestine (Fig. 11): The organ was diffusely reddened (congestion). A moderate amount of yellow pasty material was present inside the small intestine. No abnormality was detected.

Large intestine (Fig. 11): The organ was diffusely reddened (congestion). A moderate amount of pasty green material was present in the large intestine lumen. No abnormality was detected.

Rectum (Fig. 11): A moderate amount of pasty, unformed faecal matter was present. No abnormality was detected.

Liver (Fig. 8): The organ was moderately congested. No abnormality was detected.

Pancreas (Fig. 11): The organ was markedly reddened (congestion). No abnormality was detected.

Urogenital system

Kidneys (Fig.10): The organs were markedly and bilaterally congested. No abnormality was detected.

Ureter (Fig. 10): No abnormality was detected.

Urinary bladder (Fig. 10): The urinary bladder was empty and reddened (congestion). No further abnormality was detected.

Ovary (Fig. 10): No abnormality was detected.

Uterus (Fig. 10): The organ was markedly congested. No further abnormality was detected.

Vagina/Vulva (Fig. 10, 22, 23): The mucosa of the vagina and vulva were markedly congested. No abnormality was detected.

Lymphatic system

Spleen (Fig. 8): Spleen was moderately to markedly enlarged (congestion). No further abnormality was detected.

Lymph nodes (mesenteric - Fig. 8): No abnormality was detected.

Bone marrow: The femoral bone marrow was red and firm. No abnormality was detected.

Endocrine system

Pituitary gland: No abnormality was detected.

Thyroid glands: No abnormality was detected.

Parathyroid glands: No abnormality was detected.

Adrenal glands: No abnormality was detected.

HISTOPATHOLOGY

All organs and tissues exhibited moderate to marked autolytic changes (depending on the organs) and moderate freeze/thaw artefacts.

Integumentary system:

Skin:

Dorsal neck: No histological abnormality is recognised.

Ventral neck (corresponding to the location of the chain and related reddening): Epidermis is focally detached from the basal lamina or forming sub basilar or intraepidermal small vesicular-like spaces occasionally filled with pale eosinophilic material (consistent with plasma ultra-filtrate) with no associated inflammatory infiltration. Moderate hyperaemia of dermal superficial vessels is recognised in correspondence to the aforementioned epidermal lesions. The skeletal fibres of the superficial muscle, in correspondence with the area characterised by epidermal detachments, exhibit hypereosinophilia and condensation (consistent with compression). Small brown irregular crystal-like, ~40 microns in diameter fragments were recognised on the surface of the epidermis and occasionally underneath the superficial epidermal layers (compatible with rust fragment). No inflammatory cell infiltrate is detected.

Footpads (central foot pad, hindlimbs): Within the area characterised by grossly evident worn, the keratinocytes layer is thinner. No inflammation is recognised.

Muscular system:

Femoral quadriceps (right): No histological abnormality is recognised.

Brachial triceps (right): No histological abnormality is recognised.

Nervous system

Brain (frontal cortex, hippocampus, cerebellum and medulla oblongata): Apart from generalised moderate congestion no histological abnormality is recognised.

Spinal cord (C1, C2, C4, and C6): Apart from multifocal presence of small aggregates of extravasated red blood cells (haemorrhages), no histological abnormality is recognised.

Cardiovascular system

Heart (right and left ventricles, interventricular septum): No histological abnormality is recognised.

Respiratory system

Nasal cavity: Large and small mucosal blood vessels are markedly dilated by intravascular accumulation of erythrocytes (hyperaemia/ congestion). No inflammatory infiltrates are recognised.

Lungs (caudal lobes): Diffusely within the lungs extravasated erythrocytes (haemorrhages) associated with abundant pale eosinophilic amorphous material (alveolar oedema) is recognised.

Lymphatic system

Spleen: A marked increase in red blood cells within the red pulp (congestion) is recognised. No further histological abnormality is recognised.

Lymph nodes: No histological abnormality is recognised.

Bone marrow: All cell lines are represented. No histological abnormality is recognised.

Gastrointestinal tract

Stomach (antrum): Apart from moderate post mortem changes, no histological abnormality is recognised.

[REDACTED]

Small intestine: Apart from moderate to marked post mortem changes no histological abnormality is recognised.

Large intestine: Apart from moderate post mortem changes no histological abnormality is recognised.

Liver: Apart from moderate to marked post mortem changes no histological abnormality is recognised.

Pancreas: Apart from moderate post mortem changes no histological abnormality is recognised.

Urogenital system

Kidneys: A marked increase in intravascular red blood cells is recognised (congestion). No further histological abnormality is recognised.

Urinary bladder: No histological abnormality is recognised.

Ovary: No histological abnormality is recognised.

Uterus: No histological abnormality is recognised.

Vulva: Mucosal blood vessels are markedly enlarged without associated inflammatory changes (congestion).

Vagina: Mucosal blood vessels are markedly enlarged without associated inflammatory changes (congestion).

Endocrine system

Pituitary gland: No histological abnormality is recognised.

Thyroid glands: No histological abnormality is recognised.

Parathyroid glands: No histological abnormality is recognised.

Adrenal glands: Apart from marked post mortem changes, no histological abnormality is recognised.

COMMENT

Necropsy was performed on a female entire Mastiff/Staffie Cross ([REDACTED]) that was reported as being hung.

The animal was in good body conditions.

Grossly, the animal exhibited the following lesions:

- Diffuse moderate reddening on the skin on the head and the abdomen including mammary glands and hindlimbs, in contrast with skin on the thorax and shoulders.
- Bilateral symmetrical ~1 cm in diameter focal erosion on footpads of the hindlimbs
- The nails of the hindlimbs bilaterally and markedly worn.
- A moderate diffuse reddening within the subcutis of the face, abdomen, and hindlimbs.
- Veins of the subcutis on the face, close to the ears and the larynx markedly enlarged and full of blood (hyperaemia, congestion).
- A moderate amount of blood within the nasal cavity. Soft tissues surrounding the nasal cavity moderately to markedly reddened.
- All the abdominal organs, including kidneys, pancreas, uterus urinary bladder, small intestine, were markedly reddened (hyperaemia, congestion). A moderate diffuse reddening of the meninges was also recognised.
- A single 2x2 cm in diameter reddened area close to the ventral portion of the left region of the thigh.
- A moderate amount of blood under the epiglottis.
- A moderate amount of blood mixed with foamy fluid within the lumen of the larynx.

- Abundant frothy red fluid within trachea and bronchi (lung oedema and haemorrhage).
- Multifocal dark red areas, in particular within the caudal lobes bilaterally on the lungs with rib impressions.
- The mucosa of the vagina markedly congested.
- Spleen moderately to markedly enlarged (hyperaemia, congestion).
- Increased laxity of the joint between C6 and C7 (cervical vertebral column)

The animal exhibited several gross signs that render the hypothesis of being alive when hung most likely.

Animals hung alive are reported to exhibit reddening of skin on the teats, perineum, and vulva. Subcutaneous bruising at the angle of the jaw, generalised congestion of the skin of the neck, fracture of the hyoid (in mature animals, but not observed in this case), froth pink fluid in trachea, congestion of lungs predominantly within diaphragmatic lobes¹ are considered gross finding commonly detected and supporting (in addition to the absence of any other pathological change to explain death) the hypothesis that the animal was alive when hung.

Many of the signs reported in literature are recognised in the present case. Fracture of the hyoid in this case was not detected and this can be explained by the relatively young age of the subject.

The presence of reddening in most of the abdominal organs is consistent with congestion that can happen pre- or post- mortem in an animal hung by the neck, due to simple gravity force applied to fluids in the body however reddening of the upper areas (veins on the neck, subcutis of the face) requires the circulatory system (the heart as a pump) in active function to determine the phenomenon against the gravity. As per definition an animal is considered alive when the heart is beating.

Differentiation between hyperaemia (active process) and congestion (passive, hydrodynamic process) cannot be conclusively established on a gross basis only. Histology identified markedly enlarged blood vessels in many visceral organs in absence of inflammation. This can exclude a hyperaemic process due to inflammation at site, and support the hypothesis that these areas were congested due to an increase of blood pressure.

Histology characterised also enlargement of superficial dermal vessels in correspondence with small areas of intraepidermal plasma-like substance on the ventral neck area associated with fragments of material consistent with rust from the collar and no associated inflammation (corresponding to the small areas of bruising detected grossly). In this specific area it is likely that the mechanical action of the collar, led to trauma with subsequent active hyperaemia and intraepidermal oedema as a consequence. This finding further corroborates the scenario in which the dog was hung alive.

Presence of erosion on the hindlimbs footpads and consumption of nails can be grossly consistent with the animal exhibiting a wrong posture in life, or can be consistent with the animal violently moving the feet against a rough surface while hung.

The single 2x2 cm in diameter reddened area close to the ventral portion of the left region of the thigh is consistent with a mild blunt wound (trauma against surface when hung?).

A detailed section of the cervical spinal cord revealed no fractures but confirmed an increased laxity between C6 and C7. It is not possible to establish if this happened pre or post mortem but is consistent with the animal being hung. The gross observation of haemorrhagic fluid along the epi- and subdural space along the spinal canal is not fully supported by histopathology and is probably due to a sampling artefact or interpreted as an un-specific finding.

No histological changes were recognised within the spinal cord.

Overall, gross and histopathological changes are consistent with the animal being alive when hung, and dying due to acute cardiorespiratory insufficiency.



Name Surname, DVM, DipECVP, PhD, MRCVS
Lecturer in Veterinary Pathology
6th August 2014

Preliminary report was sent on 09/07/14 with pictures.

Reference cited:

1. *Munro R, Munro HC: Animal Abuse and Unlawful Killing: Forensic veterinary pathology, 1e Saunders Ltd.; 1 edition (4 July 2008)*

**PLEASE ARRANGE COLLECTION OF THIS ANIMAL.
PLEASE NOTE THE ANIMAL WILL BE DISPOSED OF IF IT IS NOT COLLECTED WITHIN ONE
MONTH OF THE DATE OF THIS REPORT.**