

Genus : Spirocerca

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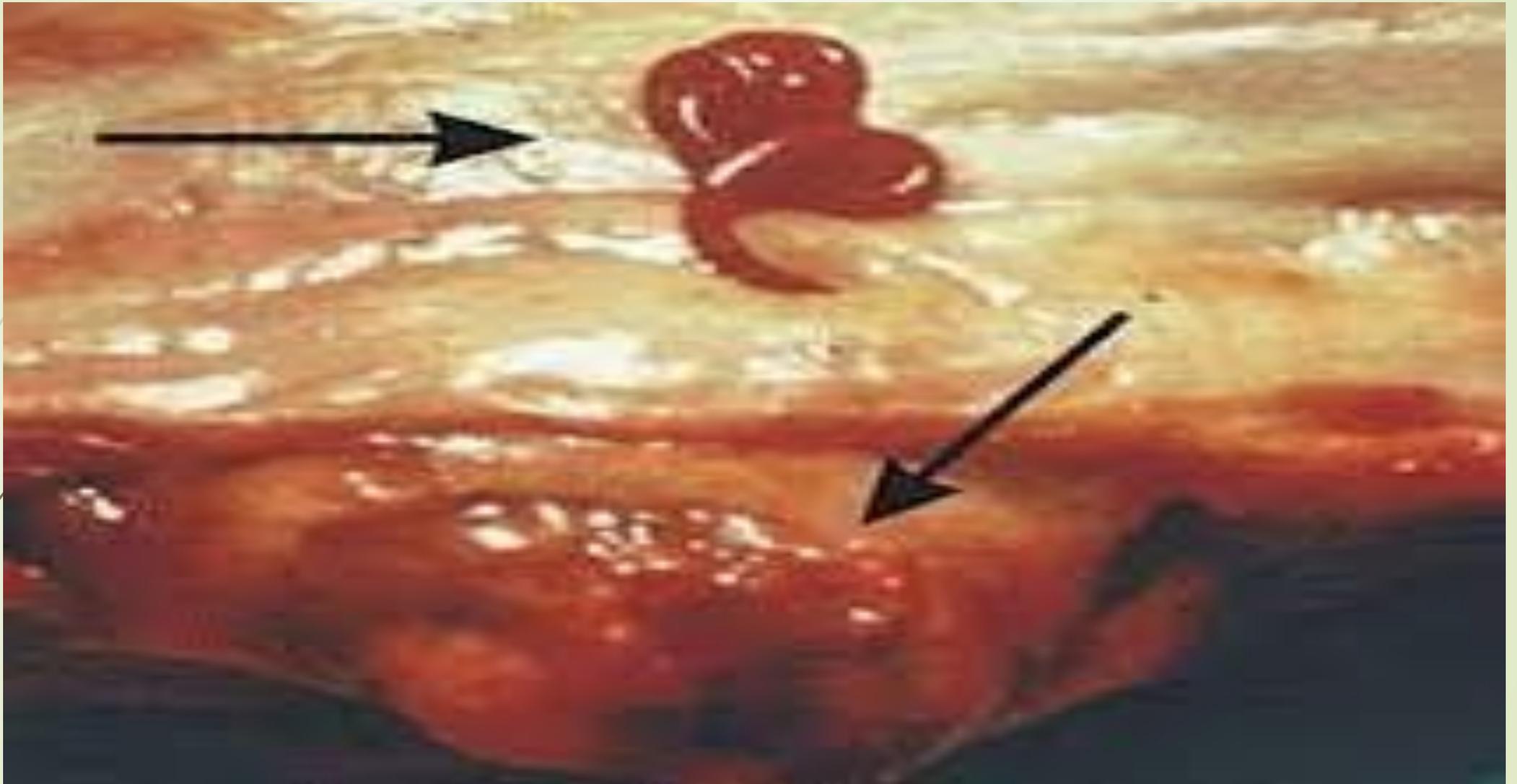
Spirocerca : Morphology

- The adults worms are stout ,spirally coiled, cylindrical and bright pinkish to red in color .
- The mouth is surrounded by six lips. Lips are trilobed.
- They also have a well developed buccal capsule with thick walls.
- Females are approximately 5 to 8 cm long while males are slightly smaller, 3 to 5. 5 cm long.
- Spicules are unequal.
- Male tail end has small lateral alae and have 5 pairs and one median precloacal papillae and two pairs of post cloacal papillae.
- Group of small papillae occurs at the tip of tail.
- Eggs are gelatin capsule shaped, thick shelled and contains fully developed larvae.



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Spirocerca lupi



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Spirocerca in stomach

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Spirocerca : Life cycle

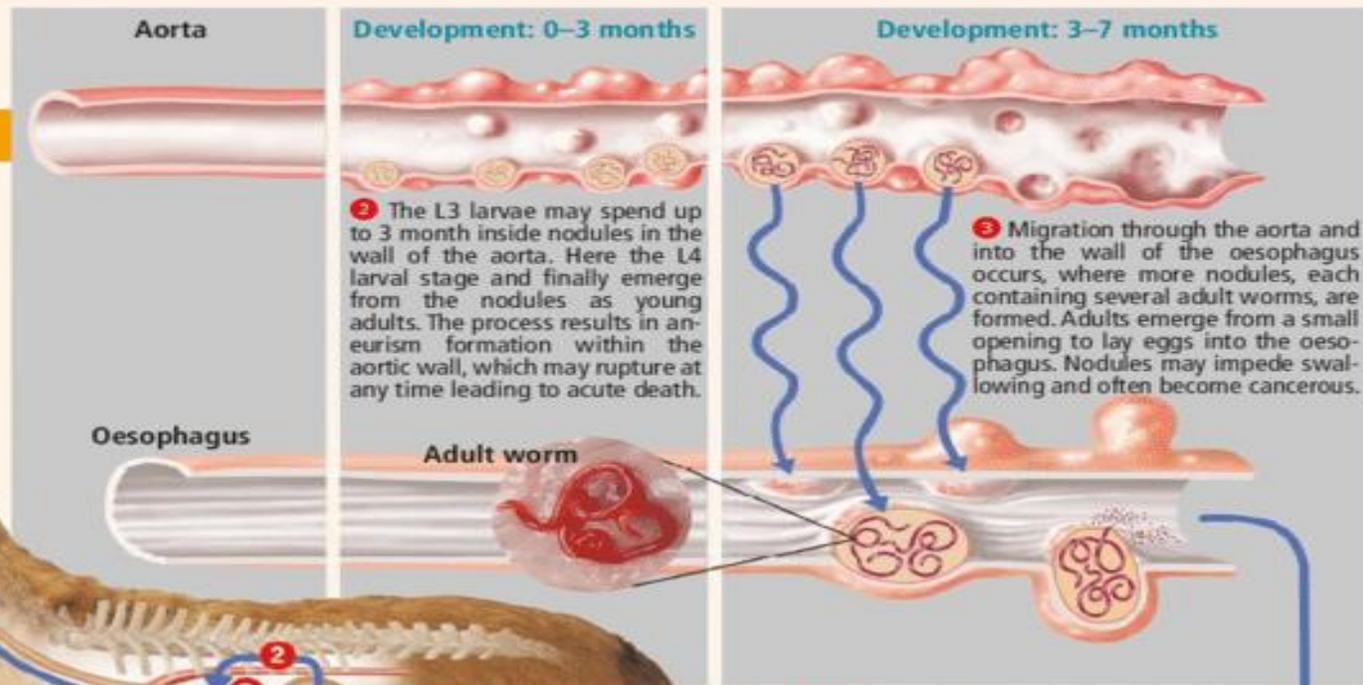
- The adult worm found in a nodule within the wall of the dog's thoracic oesophagus.
- The female lays small embryonated eggs, which are transferred into the oesophageal lumen.
- Through oesophageal lumen the eggs are excreted in the faeces.
- These eggs are ingested by the intermediate host, coprophagous beetles, inside the beetles they hatch and develop to the infective (L3) stage within 2 months.
- The dogs or the other carnivores are infected by ingestion of an infected beetles harboring infective L3 stages.
- Sometimes transport hosts such as lizards, birds, and rabbits may ingest beetles and remain infected .

Spirocerca : Life cycle...contd

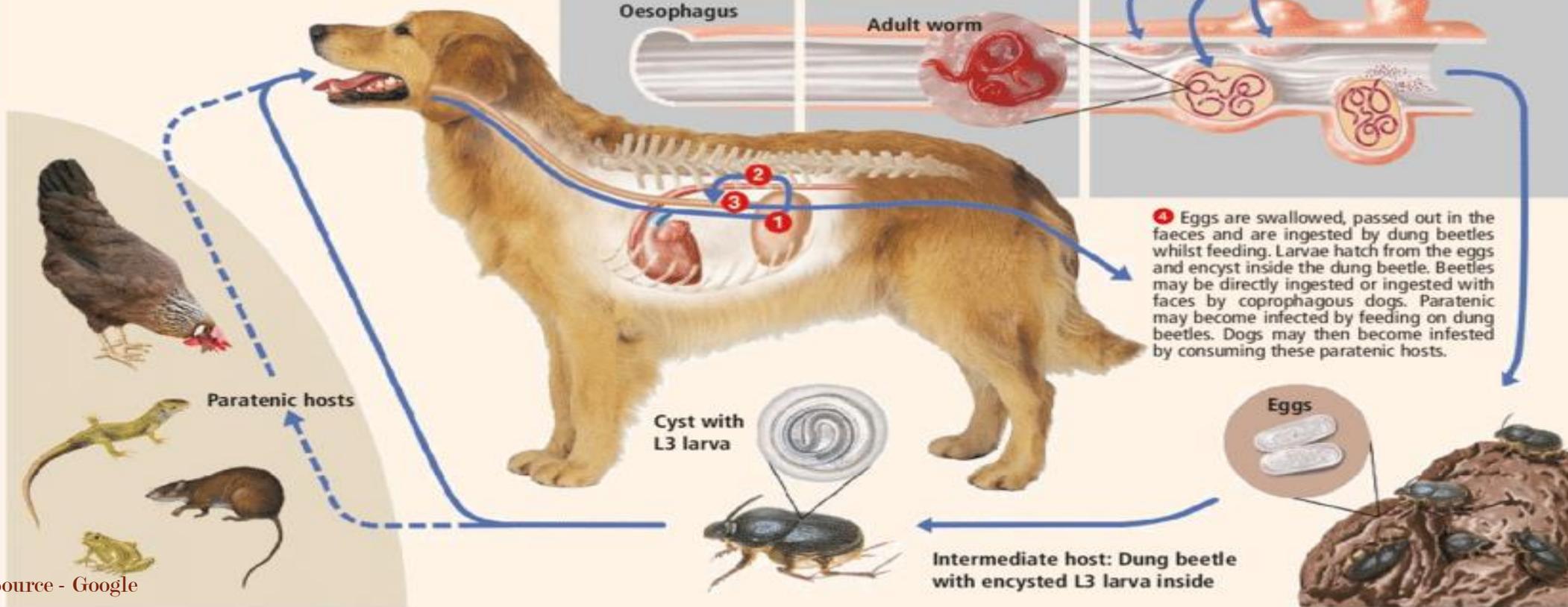
- These paratenic hosts transmits the infection to dogs when killed and ingested as prey.
- The infective larvae are released in the stomach of the definitive canine host.
- They penetrate the gastric mucosa and migrate within the walls of the gastric arteries to the thoracic aorta approximately 3 weeks after ingestion.
- About 3 months post-infection, the larvae migrate from the aorta to the oesophagus at a point between the diaphragm and the aortic arch.
- At this location, the worms initiate the development of granulomas as they mature to adults over the next 3 months.

Spirocerca lupin life cycle

1 L3 larvae emerge from dung beetle in the stomach, penetrate the stomach wall and migrate to the gastric arteries. Larvae then travel upstream to the aorta.



4 Eggs are swallowed, passed out in the faeces and are ingested by dung beetles whilst feeding. Larvae hatch from the eggs and encyst inside the dung beetle. Beetles may be directly ingested or ingested with faeces by coprophagous dogs. Paratenic may become infected by feeding on dung beetles. Dogs may then become infested by consuming these paratenic hosts.



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Spirocerca : Life cycle

Spirocerca : Pathogenesis

- The growing oesophageal tumor resulting into regurgitation and/or vomiting due to blockage in oesophageal lumen.
- Decreased intake of food results in considerable weight loss and emaciation.
- In some cases death occurs due to rupture of an aortic aneurysm induced by migration of worms in the aortic wall .
- Oesophageal granulomas and aortic scarring leading to aneurysms are the most frequent lesions.
- Spondylitis of the caudal thoracic vertebrae and the development of hypertrophic osteopathy are typical lesions.
- Infection with *S. lupi* has also been associated with salivary gland necrosis.
- Fibrosarcoma or osteosarcoma can also be seen in Spirocercosis.
- Local esophageal neoplasia with occasional metastases to distant organs is occasionally found.



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Tumor in oesophagus

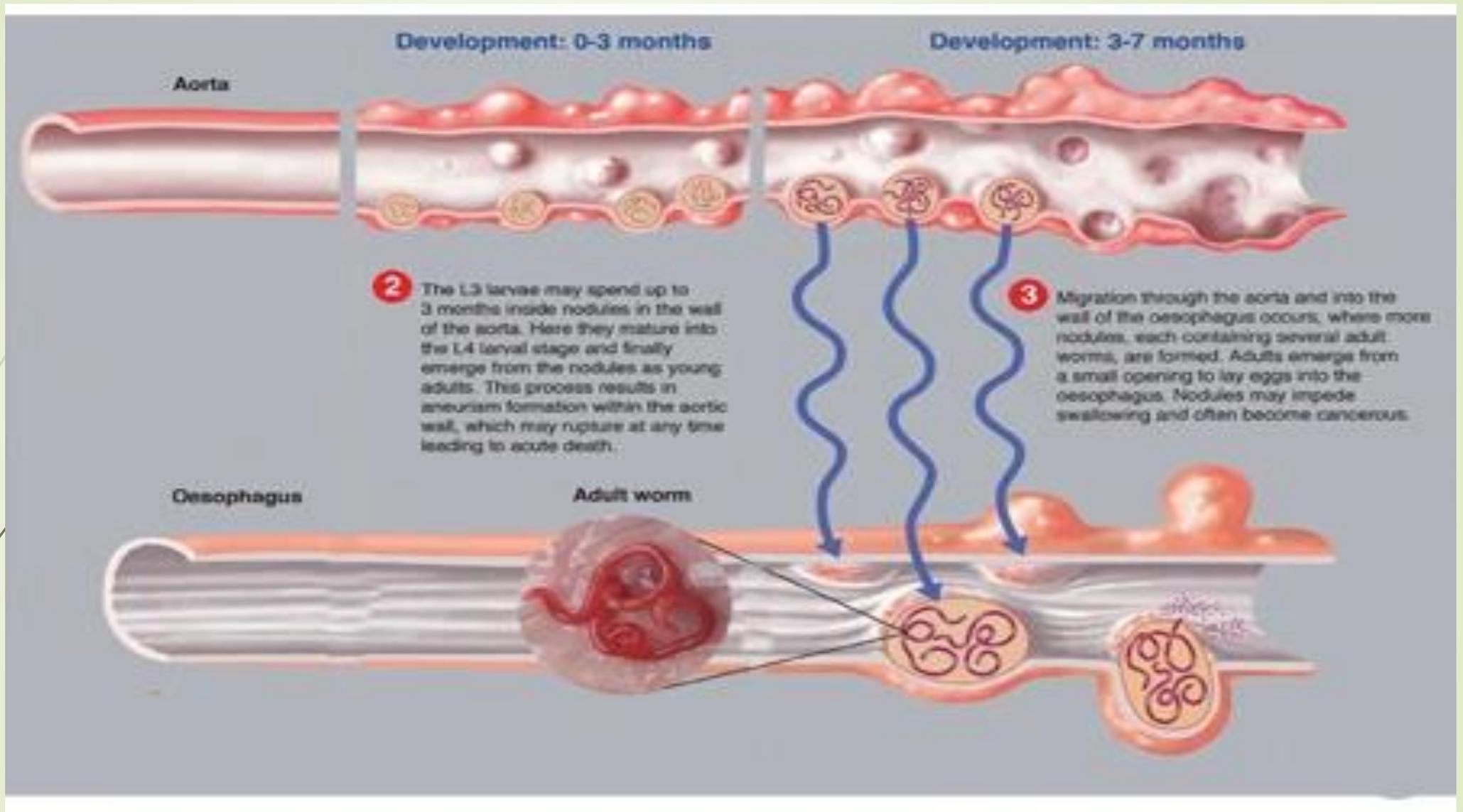
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Tumor in oesophagus

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Spirocercia in oesophageal tumors

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Spirocerca in oesophageal tumors

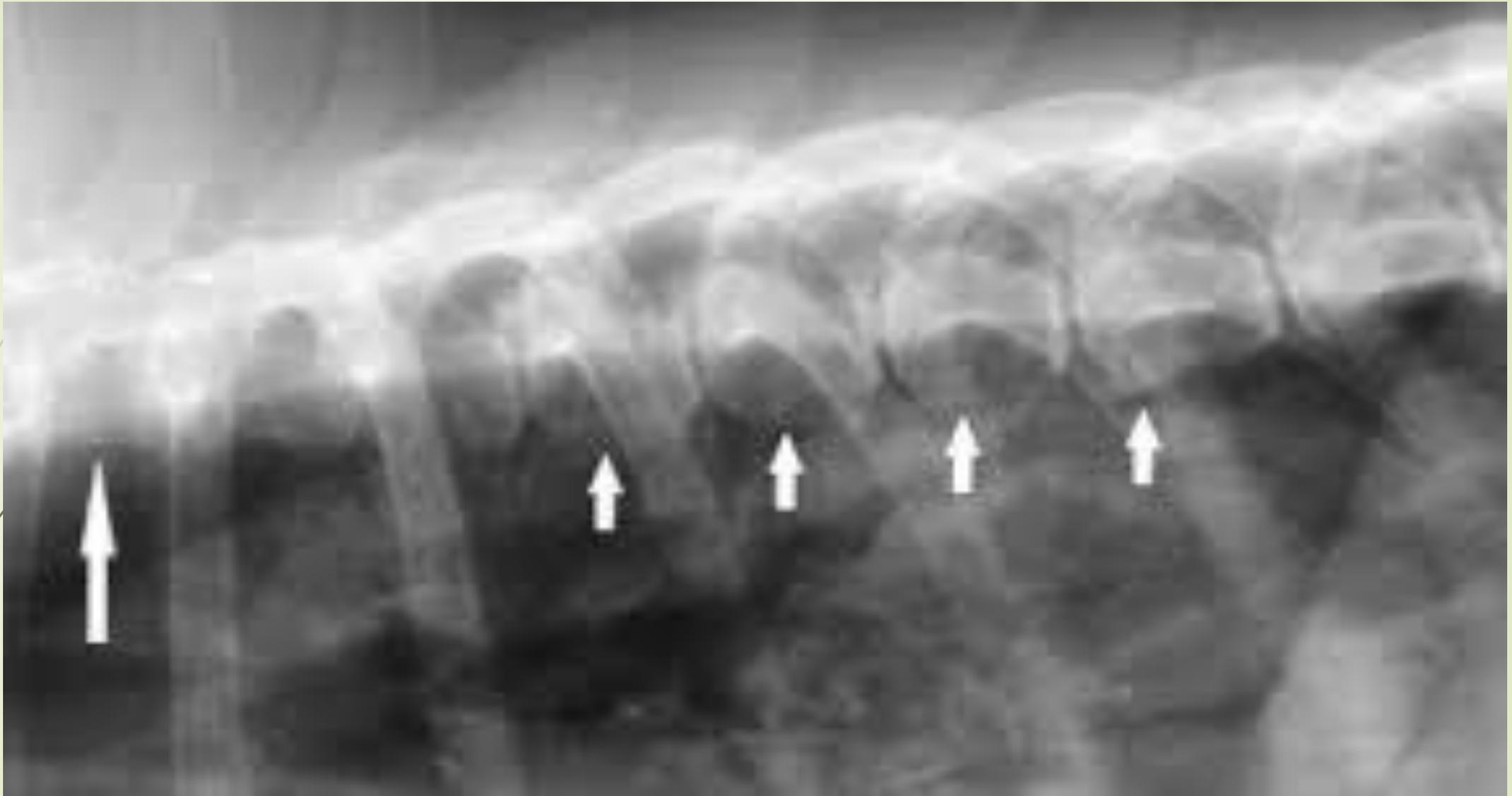
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Spirocerca in oesophageal tumors

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Spirocerca in vertebrae

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Spirocerca in vertebrae

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Spirocerca : Diagnosis

- Detection of characteristic ellipsoid embryonated eggs in faecal examination
- Radiographs of affected dogs show esophageal granulomas in thoracic survey .
- Spondylitis of the caudal thoracic vertebrae is also frequently observed on radiographs.
- Oesophagoscopy and gastroscopy allow direct visualization of the nodule showing protuberances with a distinctly nipple-like orifice. Nodules may be solitary or multiple.
- Anti-helminthic therapy and a surgical intervention can also be practised.



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Spirocerca eggs

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Spirocerca : Prevention & control

- Control can be made by prevention from intermediate hosts (beetles) or transport hosts (lizards, frogs, rodents, birds including raw chicken, etc).
- In kennels and boarding houses feces and vomits must be thoroughly eliminated as soon as possible.
- Some dewormers for dogs such as doramectin and ivermectin under advise of veterinary doctor.
- There are so far no true vaccines against *Spirocerca lupi*.