Imported Fever Service Case Presentation

Imported fever Services 12 August 2025

INSTITUTE OF TROPICAL MEDICINE ANTWERP

Male 36-years

- Pruritic urticarial induration on lower left abdomen
  - Increasing gradually in size
  - Max. diameter 12 cm
- Onset: 3 weeks after 9-week trip to Amazon
- Disappeared spontaneously after 2 weeks
- No fever nor other systemic symptoms

- No past medical history

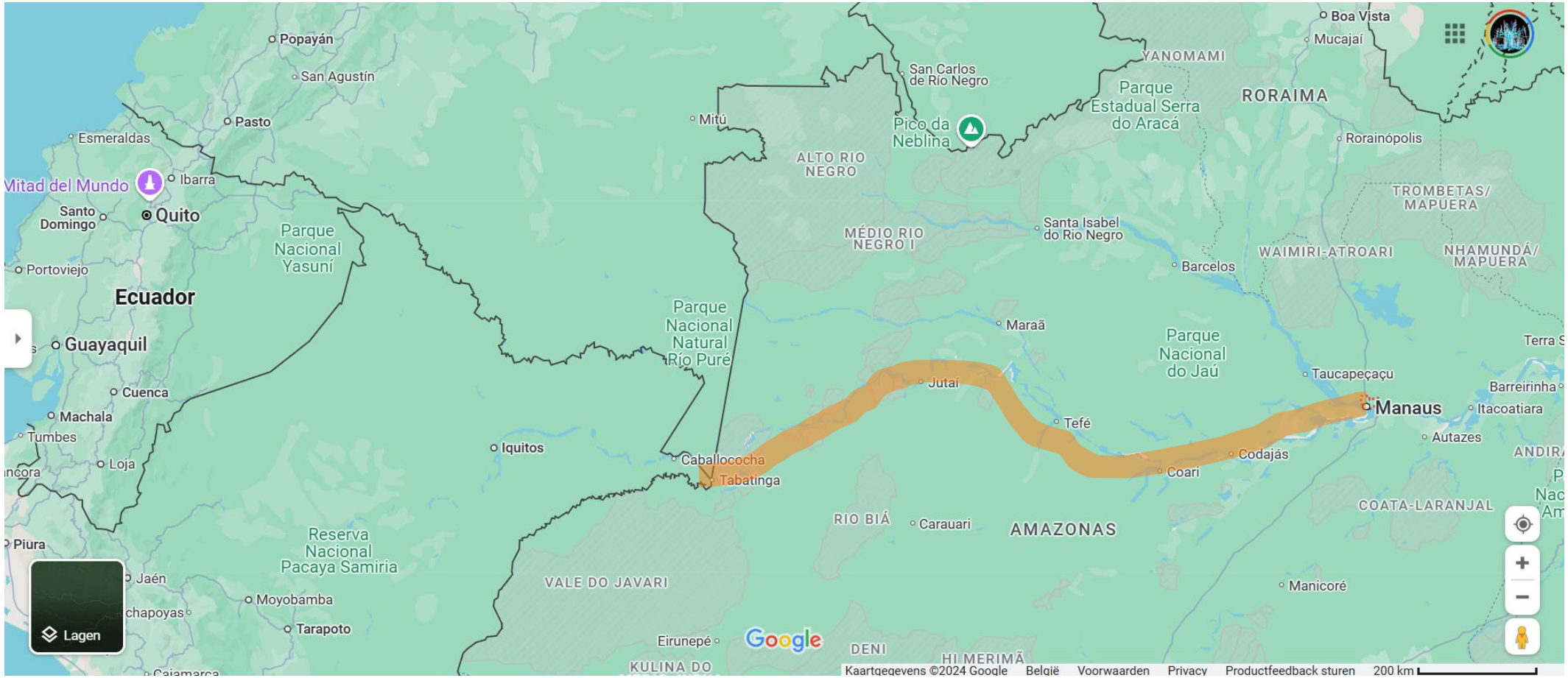
Relapse

- 1 month later
- Right side of his abdomen, migrating to the umbilicus
  → hospitalization
  → treatment with steroids and antibiotics


LEVI'S

Questions about history and examination?

Two months travel



Initial investigations

- red blood cells — $4,98.10^{12}$/L (4,30-5,70)
- hemoglobin — 14,2 g/dL (13,2-17,3)
- platelets — 264.10^{9}/L (150-450)
- white blood cells — $7,25.10^{9}$/L (3,50-9,00)
  - eosinophil count — 440 cells /µL ↑ (N.R. 30 - 350 cells/µL)
- ALT — 45 U/L (21-72)

- Stool:
  - Microscopy for ova, cysts and parasites: negative
  - *Strongyloides* PCR : negative

Differential diagnosis?

DD wandering nodule/eruption

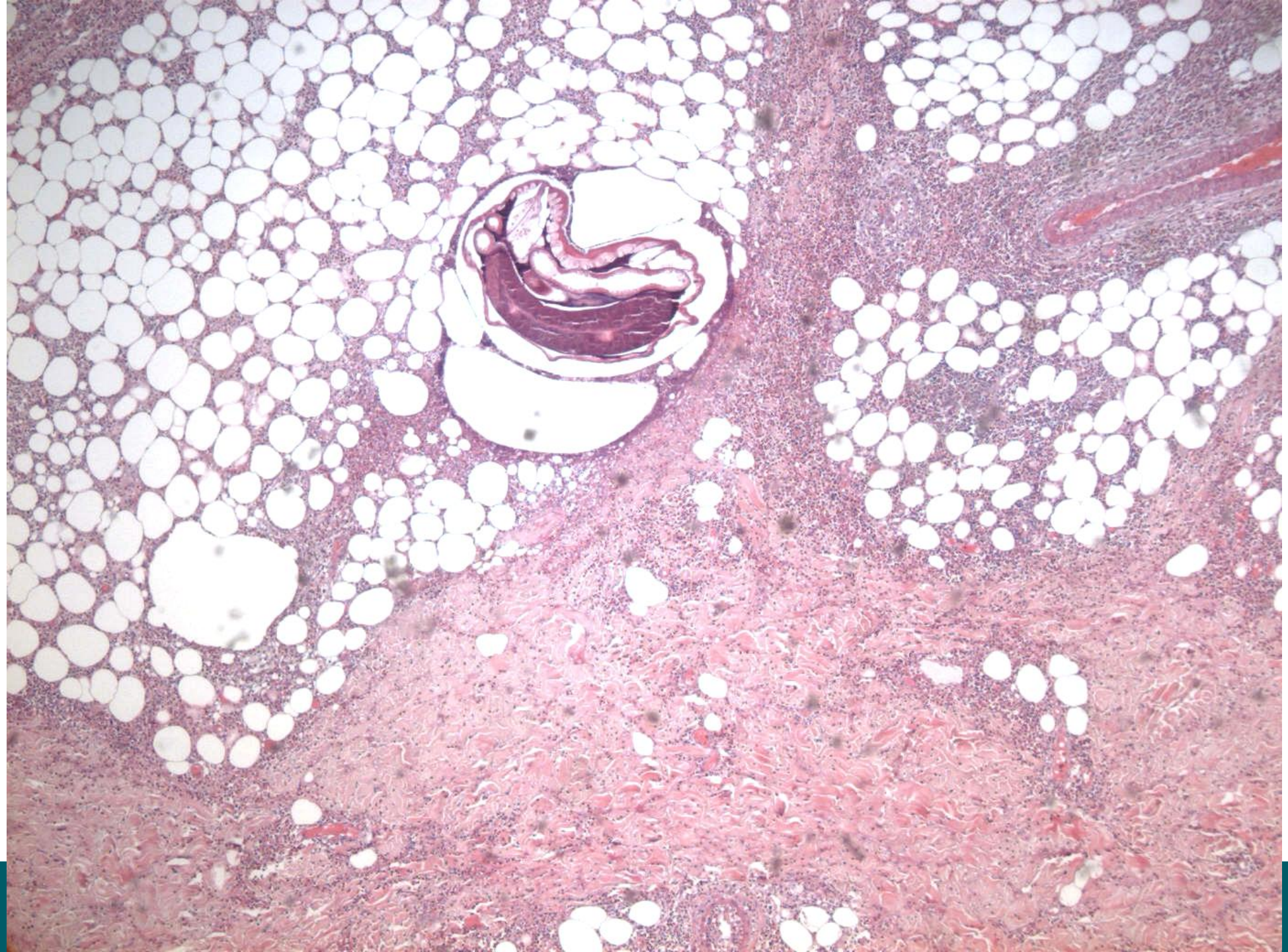
- Larva cutanea migrans, caused by animal hookworms
- Larva currens
- Loiasis
- (Toxocariasis, fasciolasis, sparganosis, …)
- …

Further investigations/progress:

- **Ultrasound**: subcutaneous oedema

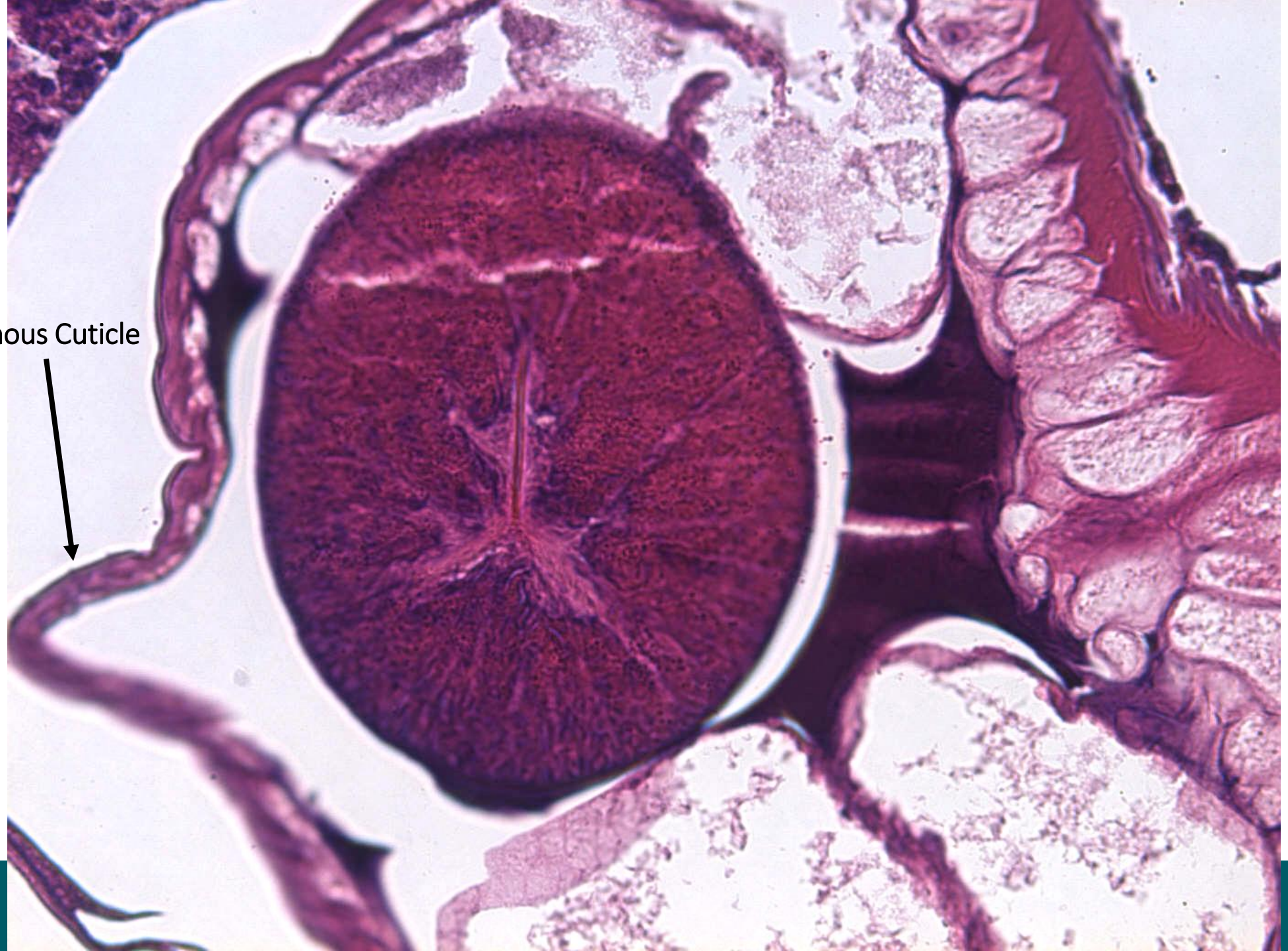
- **Serology:**
- *Strongyloides*, *Schistosoma, Fasciola, Toxocara*, *E granulosus*: **negative**

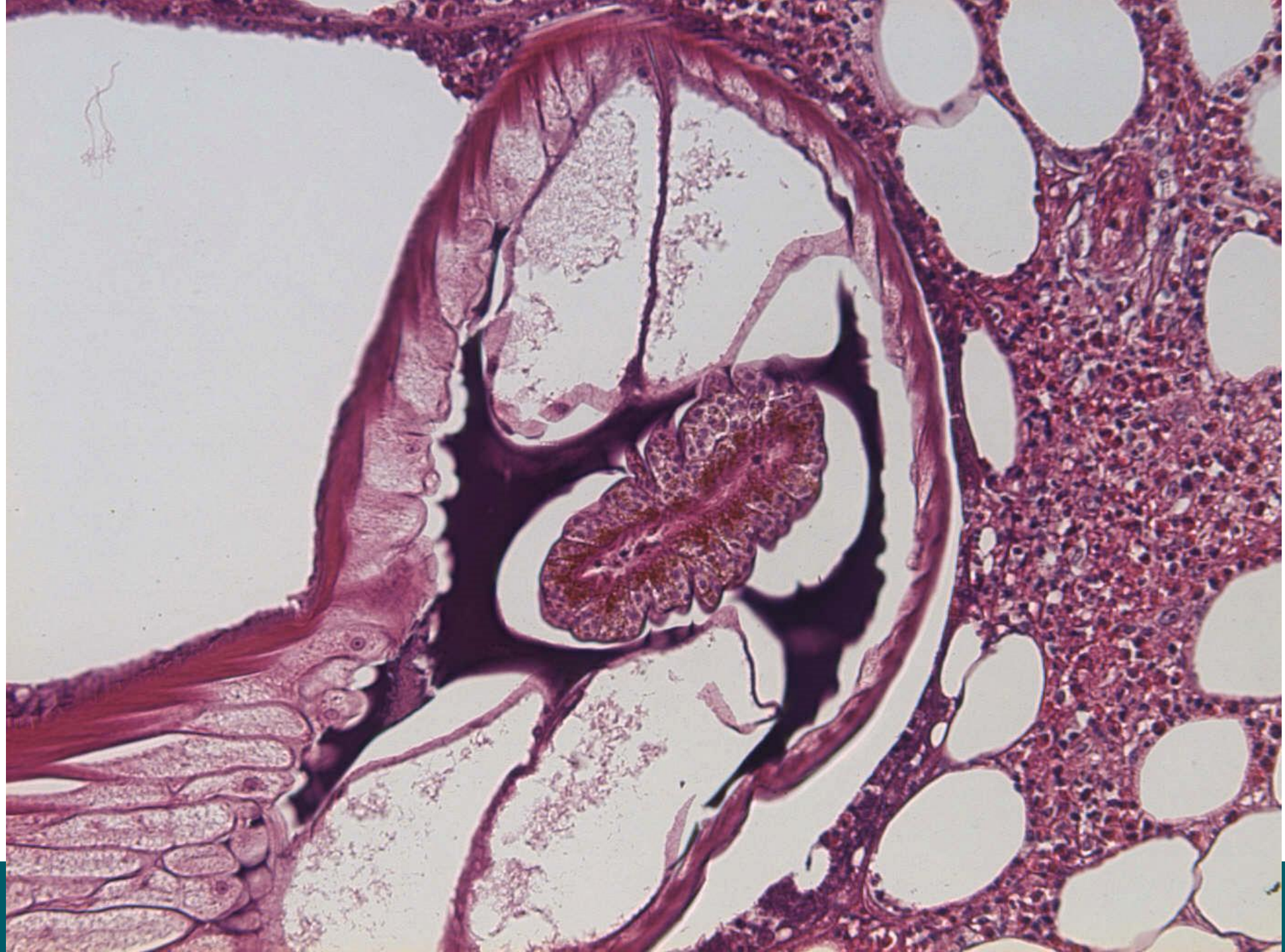
- **Proceeded to surgical removal of nodule**



Poll time!


Coelomyarian muscle cells
Intestine
Oesophagus
Large lateral chords
Cuticle


Spinous Cuticle




~ 32
epithelial
cells
Columnar
2-5 nuclei per
cell

Final diagnosis and treatment

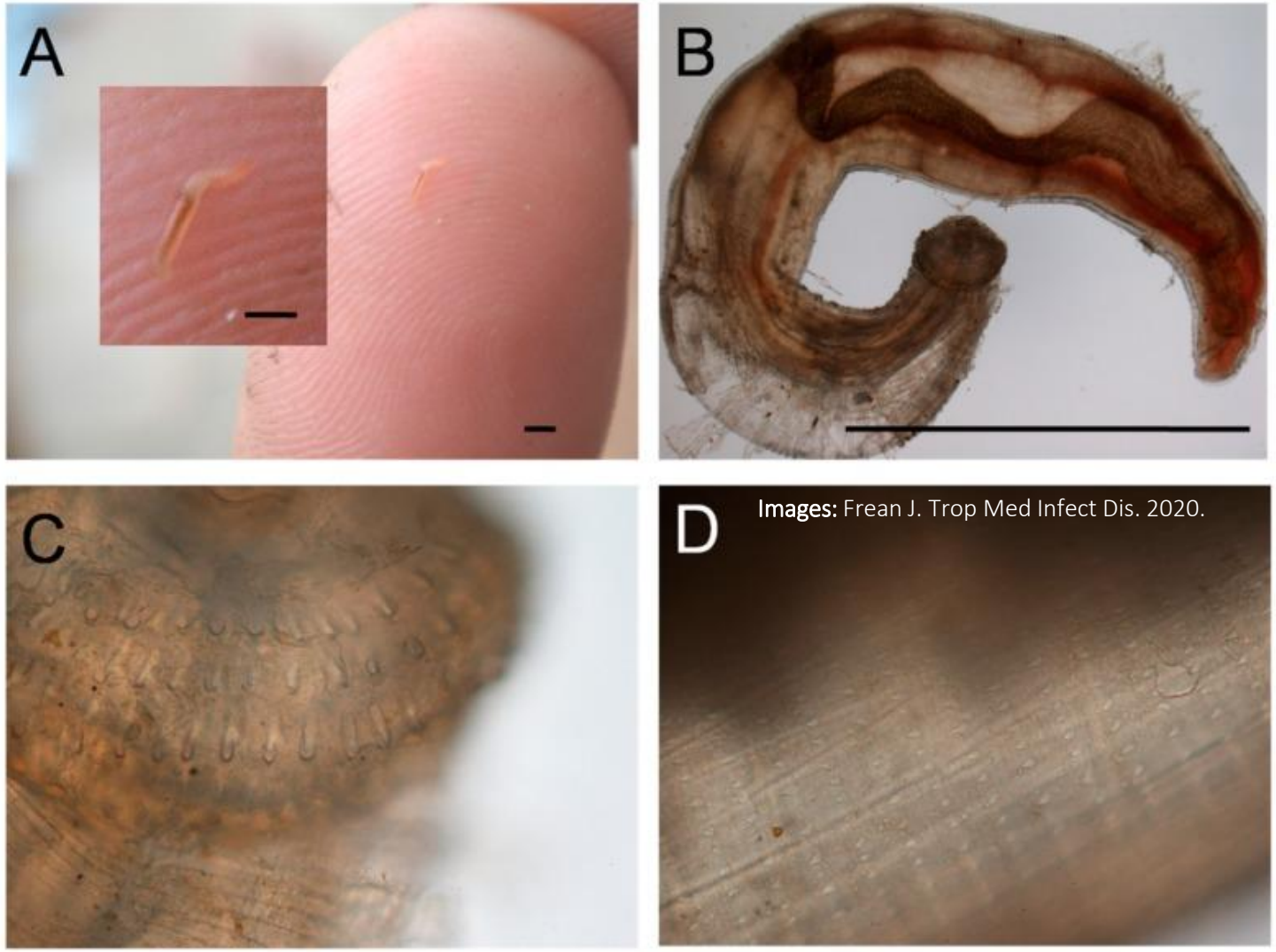
- Cutaneous *Gnathostoma binucleatum*

- Definite treatment by surgical removal
- Full recovery, no relapse

Gnathostoma species identification by histology

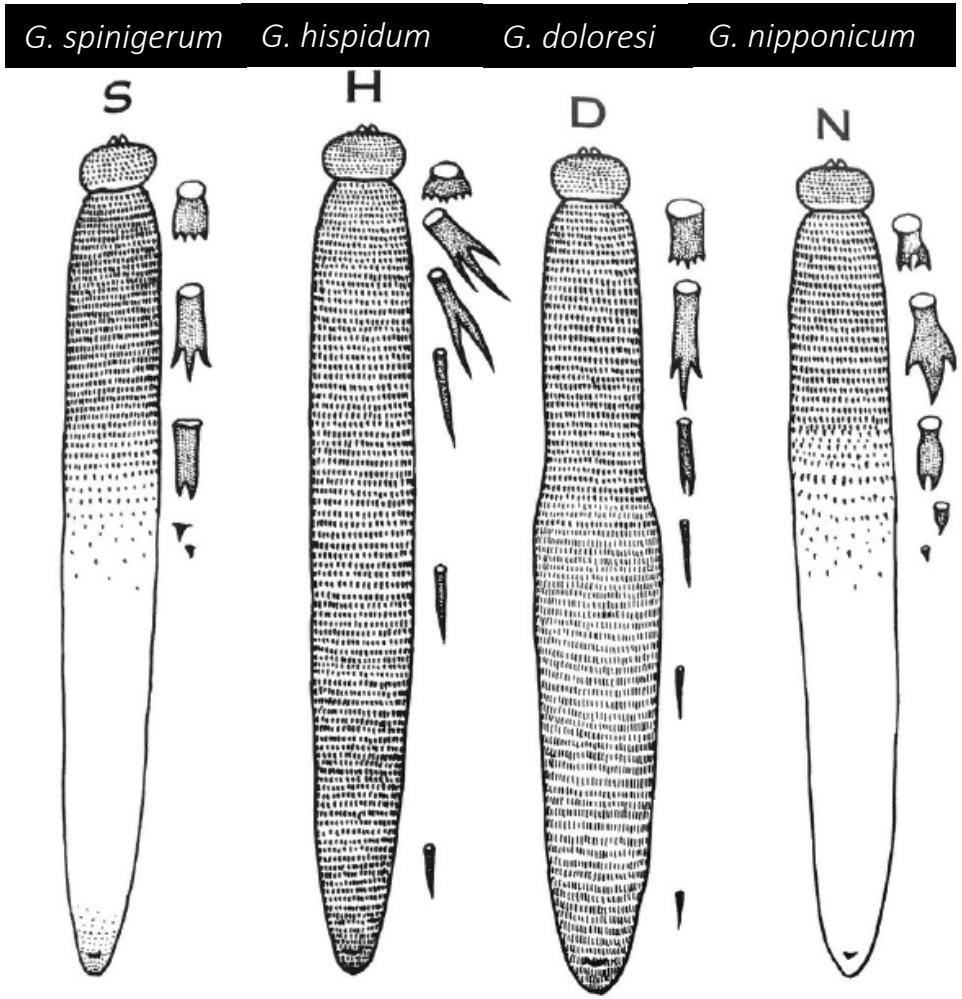
Species	Reported Geographic Distribution	Definitive host/s	Morphology of intestinal epi cells/mean diameter
Gnathostoma spinigerum	Asia (incl. Indian sub-continent), Southern Africa, Madagascar, Northern Australia (?)	Canids and Felids	Columnar, 3-7 nuclei 21-29 epithelial cells ~ 355 µm diameter at largest point
Gnathostoma binucleatum	Latin America	Canids and Felids	Columnar, 2-5 nuclei ~30 epithelial cells / ? µm diameter at largest point
Gnathostoma doloresi	South East Asia	Pigs	Spherical, 2 nuclei per cell 18-28 epithelial cells ~ 239 µm diameter at largest point
Gnathostoma hispidum **(large type)**	South East Asia, Australia, Europe	Pigs	Spherical, single nucleus per cell 17-18 epithelial cells >300 µm diameter at largest point
Gnathostoma hispidum **(small type)**			Spherical, single nucleus per cell 19-31 epithelial cells ~ 214 µm diameter at largest point
Gnathostoma nipponicum	Japan	Weasels	columnar, 1-3 nuclei per cell (single nucleus is present in 50% of larvae); 11-14 epithelial cells ~110 µm diameter at largest point
Gnathostoma malaysiae*	South East Asia	Rats	Spherical, single nucleus 20-26 epithelial cells ~ 400 µm diameter at largest point

Gnathostoma species identification – gross larvae



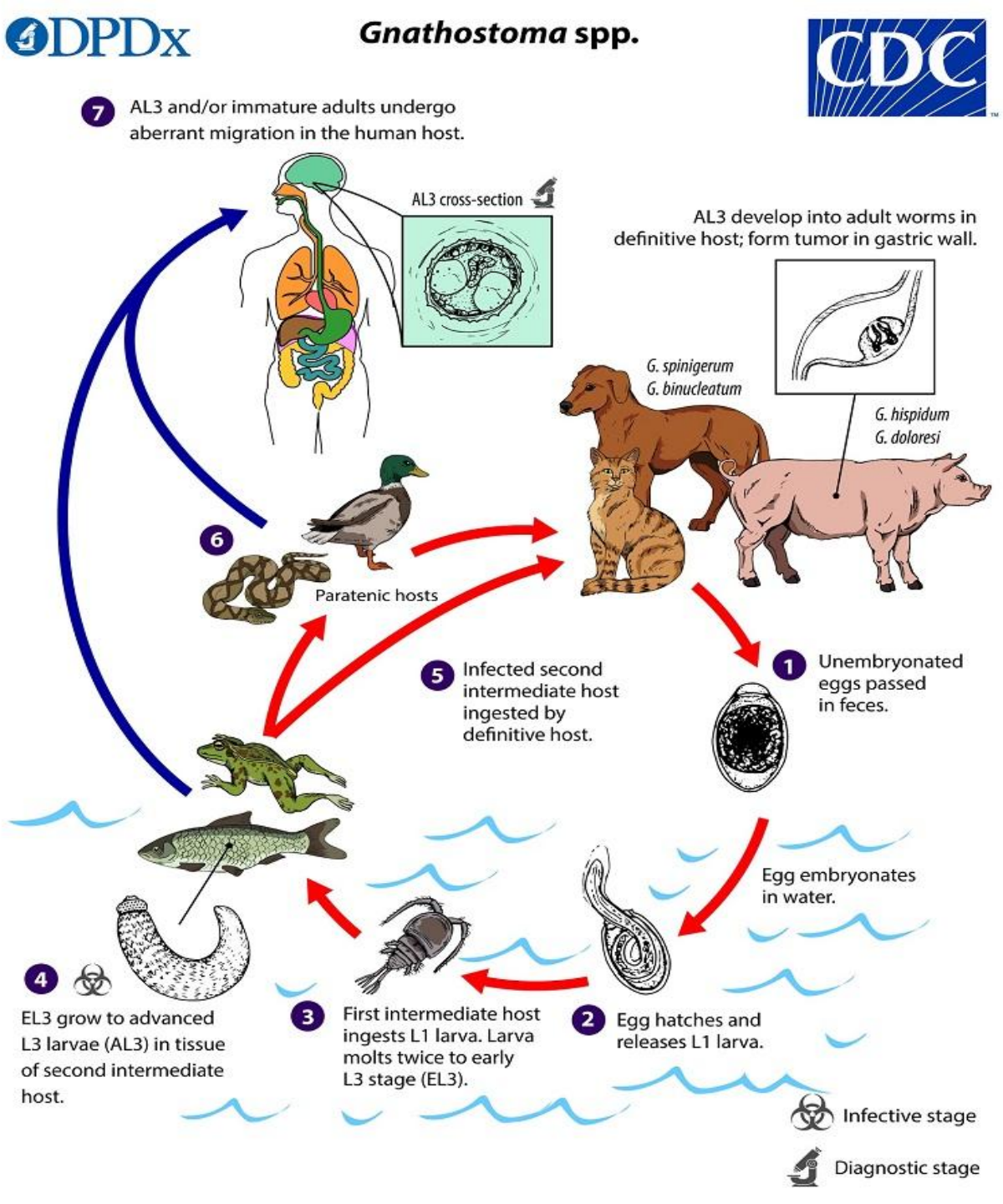
Images: Frean J. Trop Med Infect Dis. 2020.

Image: Miyazaki, I. *Illustrated Guide to Helminthic Zoonoses*, 1991



Gnathostomiasis

- Worldwide distribution
- 5000 human cases reported: *G. spinigerum, G. hispidum, G. doloresi, G. nipponicum, G binucleatum* and *G. malaysiae* (?)
- genus Spirurida
- Complex life cycle with 2 intermediate hosts, paratenic hosts (incl. humans)



Cutaneous gnathostomiasis

- “Larva migrans profundus”, “Yangtze River's edema”, “Shanghai's rheumatism”, “tuao chid” and “paniculitis nodular migratoria eosinofilica”
- Within 48 hours of ingesting an infected intermediate host, patients will often experience acute illness including vomiting, diarrhea, malaise, myalgias, fever, arthralgia and/or epigastric pain.
- Incubation: 3 weeks-5 years
- Intermittent migratory swellings (~ 1 cm per hour) - usually affecting the trunk or upper limbs
- Creeping eruption, nodule, abscesses
- Vary in size
- Pruritic, painful, or erythematous
- Pathognomonic subcutaneous hemorrhages

Diaz et al, J Travel Med 2015; Herman et al, CMR 2009

Images:
Bravo F & Gontijo B.
Anais Brasileiros
de Dermatologia. 2018

Complications

- **Ocular gnathostomiasis**
  - vision impairment and orbital cellulitis
- **Visceral gnathostomiasis**
  - Pulmonary, gastrointestinal or genitourinary
- **Neurognathostomiasis**
  - Radiculomyelitis, meningo-encephalitis, SAH
  - Severe brain damage causing paralysis, seizures and death
  - Presents with eosinophilia in the cerebrospinal fluid

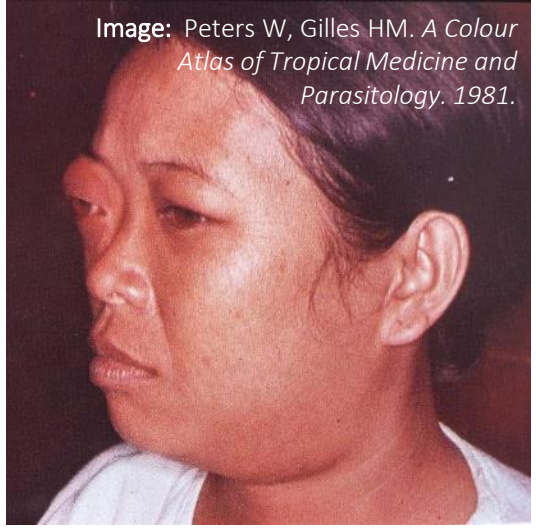


Image: Peters W, Gilles HM. *A Colour Atlas of Tropical Medicine and Parasitology. 1981.*

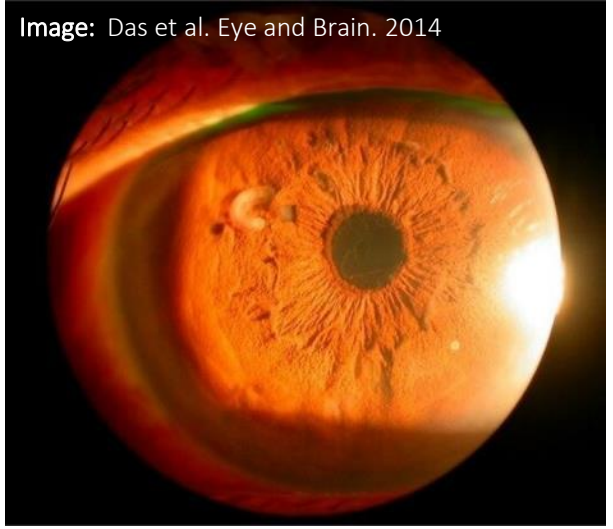
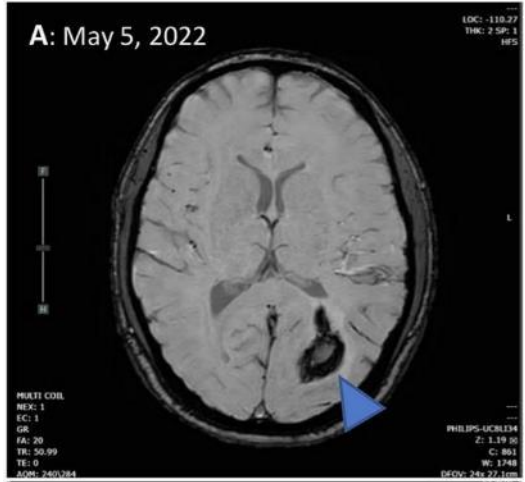
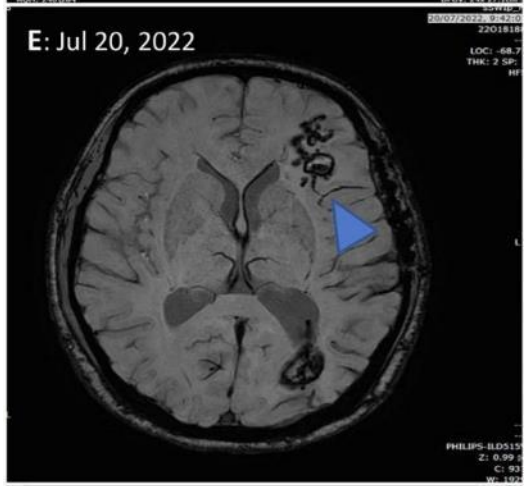


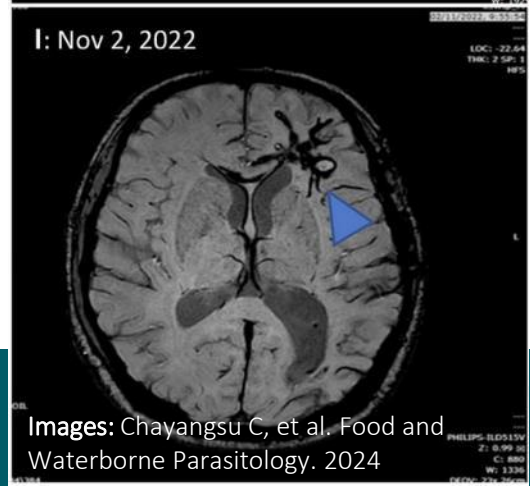
Image: Das et al. Eye and Brain. 2014

Image: Kongwattananon W, et al. Ocular Immunology and Inflammation. 2023

Images: Sivakorn C, et al. AJTMH. 2020







Images: Chayangsu C, et al. Food and Waterborne Parasitology. 2024

Diagnosis

Clinical presentation

- Migratory swellings, +/- eosinophilia, +/- exposure
- Peripheral esoinophilia
- MRI/CT for neural/visceral gnathostomiasis

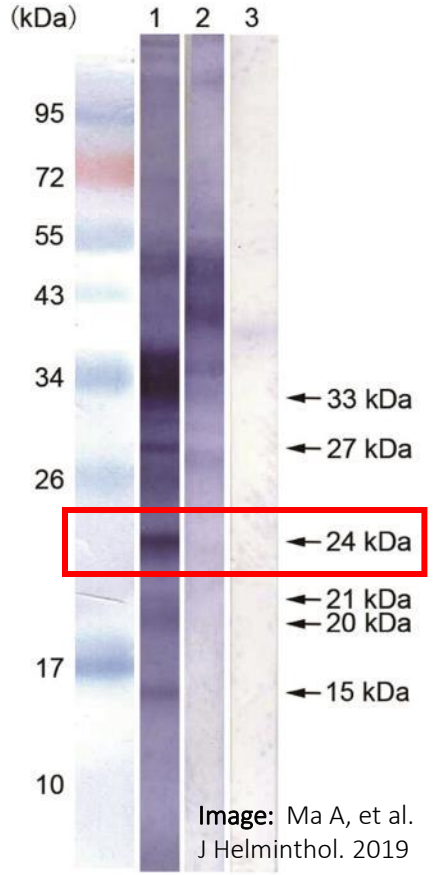


Image: Ma A, et al. J Helminthol. 2019

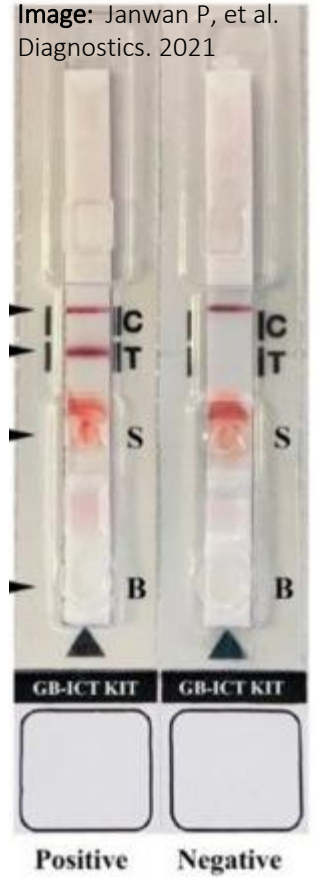


Image: Janwan P, et al. Diagnostics. 2021

Laboratory diagnosis

- Larval morphology and/or ITS 2, *cox*1 sequencing

- **Serology**
  - IgG4 rapid tests report sens 92-97%; spec 88-100%
  - 24 kDa antigen IgG4 immunoblot (Swiss TPH, Mahidol University)
    - Sens: 91-92%; Spec: 87-93% for *G. spinigerum* in Thailand (Swiss TPH, Mahidol)
    - Sens: 100% (?); Spec: 98% for *G. binucleatum* from Latin America (Swiss TPH)

Treatment

Cutaneous/Ocular	Visceral/CNS
Surgical resection (single lesion)	Albendazole 7,5 mg/kg bid x 21 days
Albendazole 7,5 mg/kg bid x 21 days	Ivermectin 200µg/kg od x 1-2 days
Ivermectin 200µg/kg od x 1-2 days	Steroids in case of CNS involvement: prednisolone 60 mg/day for 7 days
Efficacy > 90%	

Diaz et al, J Travel Med 2015; Herman et al, CMR 2009; Katchanov et al, Emerg Infect Dis 2011

Table 3
The efficacy of ivermectin and albendazole in comparative treatment for gnathostomiasis.

	Number of patients	Cured	Not cured	Percentage cured
Albendazole 400 mg once daily for 21 days (Kraivichian *et al*, 1992)	51	48	3	94.1
Albendazole 400 mg once daily for 21 days	49	46	3	93.8
Ivermectin 0.2 mg/kg single dose	21	20	1	95.2

Nontasut P et al, Southeast Asian J Trop Med Public Health. 2000

Relapse!

- Often heralded by peripheral eosinophilia
- Up to 62% in 13 imported cases (2-16 months)
- Up to 59% in 17 autochthonous cases (6-11 months)

Moore DA et al, Emerg Infect Dis. 2003; Strady et al, AJTMH 2009; Bussaratid et al SEJTMPH 2006

Learning points

- Travelers (VFRs!) to Southeast Asia and Latin America and history of consuming **raw or marinated (fresh water) fish** + **migratory swellings** + **eosinophilia**
- Definite species diagnosis by isolation (+/- sequencing) of larvae
- Presumptive diagnosis by combining serology (immunoblot) +/- imaging
- Treatment response (within 12 months)
  - Lack of symptom recurrence
  - Resolution of eosinophilia
- Prevention by education
  - Adequate cooking
  - freezing

Thank you

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