Food and Agriculture Organization of the United Nations

FAO/China Intensive Training Course on Tilapia Lake Virus (TiLV)

Sun Yat Sen University, Guangzhou, China

18-24 June 2018

Session 2

Mona Dverdal Jansen

What is currently known about TiLV

Pathology

Major clinical signs (from yesterday)

- Lethargy
- Abnormal behaviour
  - Swimming at surface
  - Stop schooling
  - Swirling, loss of balance
- Loss of appetite
- Mortality
- Ocular lesions
- Skin lesions
- Discolouration
- Abdominal distension

Clinical signs and gross pathology

- Ocular lesions
  - Exophthalmia
  - Lens opacity
  - Lens rupture
- Skin lesions
  - Ulcers, erosions
  - Haemorrhages
- Scale protrusion
- Discolouration
  - Darkening
  - Pallor

- Abdominal distension
- Anaemia
- Gill pallor

- Brain congestion
- Skin congestion
- Pale liver

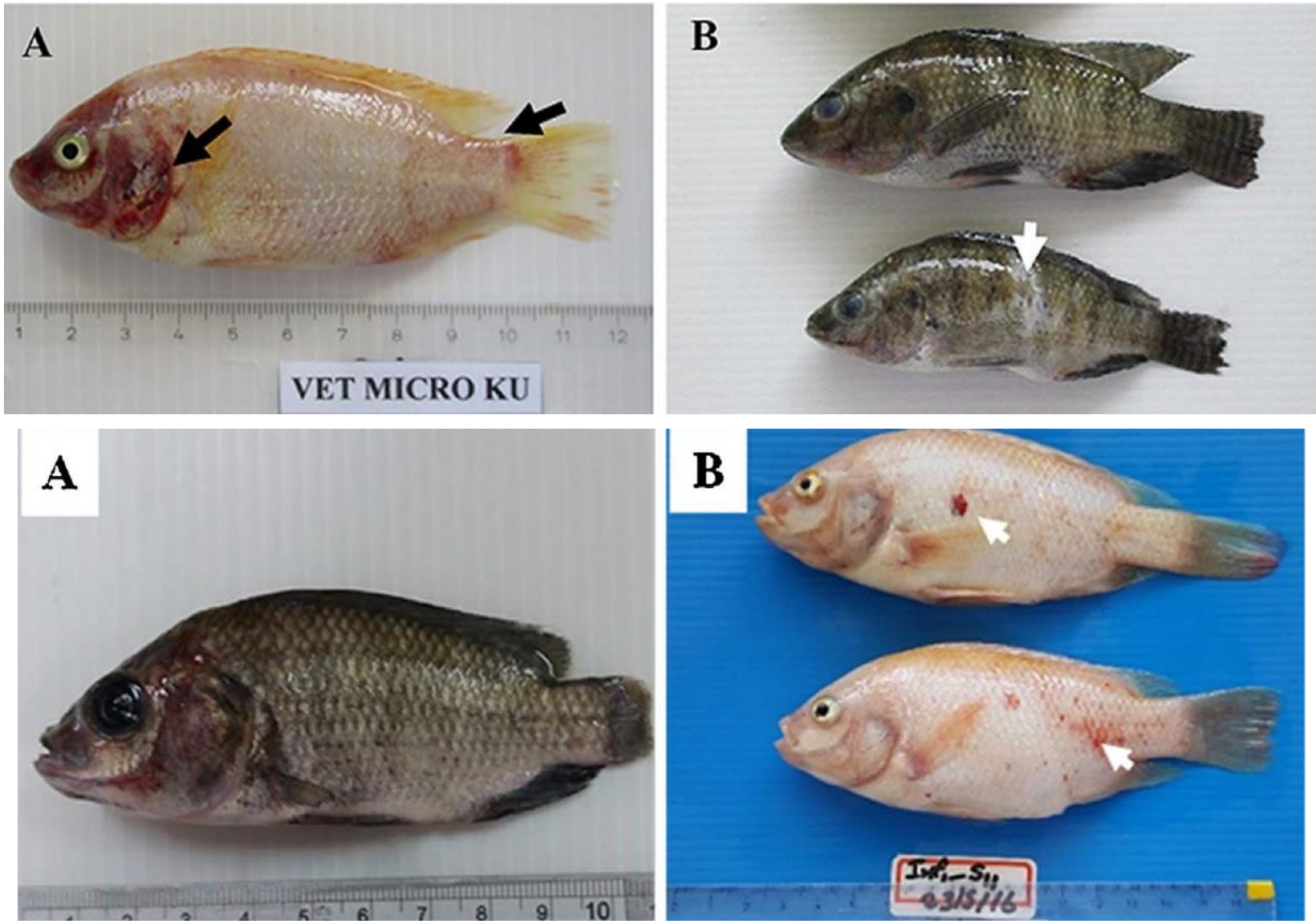
Amal *et al* (2018) Malaysia (TiLV + Aeromonas veronii)

Behera *et al* (2017) India

Eyngor *et al* (2014) Israel

Surachetpong et al (2017) Thailand

Tattiyapong *et al* (2017) – Natural infection (top), experimental IP challenge (bottom)



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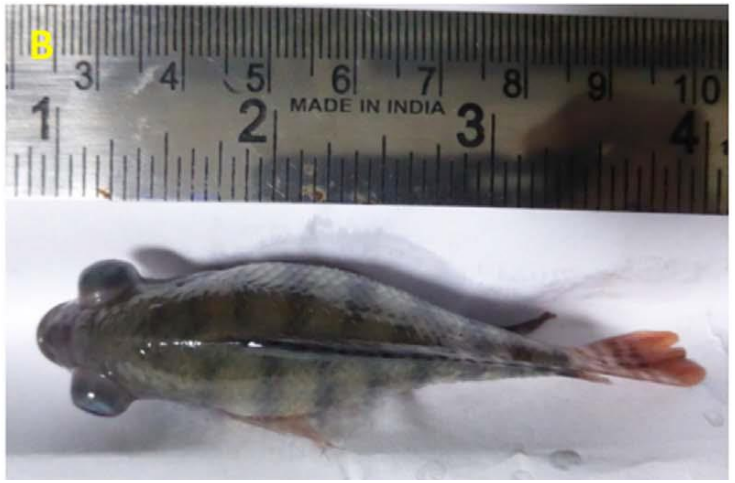


Behera *et al* (2017) India, IP experimental infection

Surachetpong *et al* (2017), Thailand

Eyngor *et al* (2014), Israel

Koesharyani *et al* (2018), Indonesia

Suspected case definition suggestions

- Any suggestions?

Suspected case definition suggestions (Jansen *et al* 2018)

- No distinctive, pathognomonic signs
- If OIE listed – “infection with TiLV”

Suspected case definition suggestions (Jansen *et al* 2018)

1) A pond/cage of tilapia fingerlings/juveniles, increased abnormal mortality 1–4 weeks after stocking, absence of obvious non-infectious causes

Or

2) pond/cage of tilapia subadults/adults with increased abnormal mortality in the absence of obvious non-infectious causes

Or

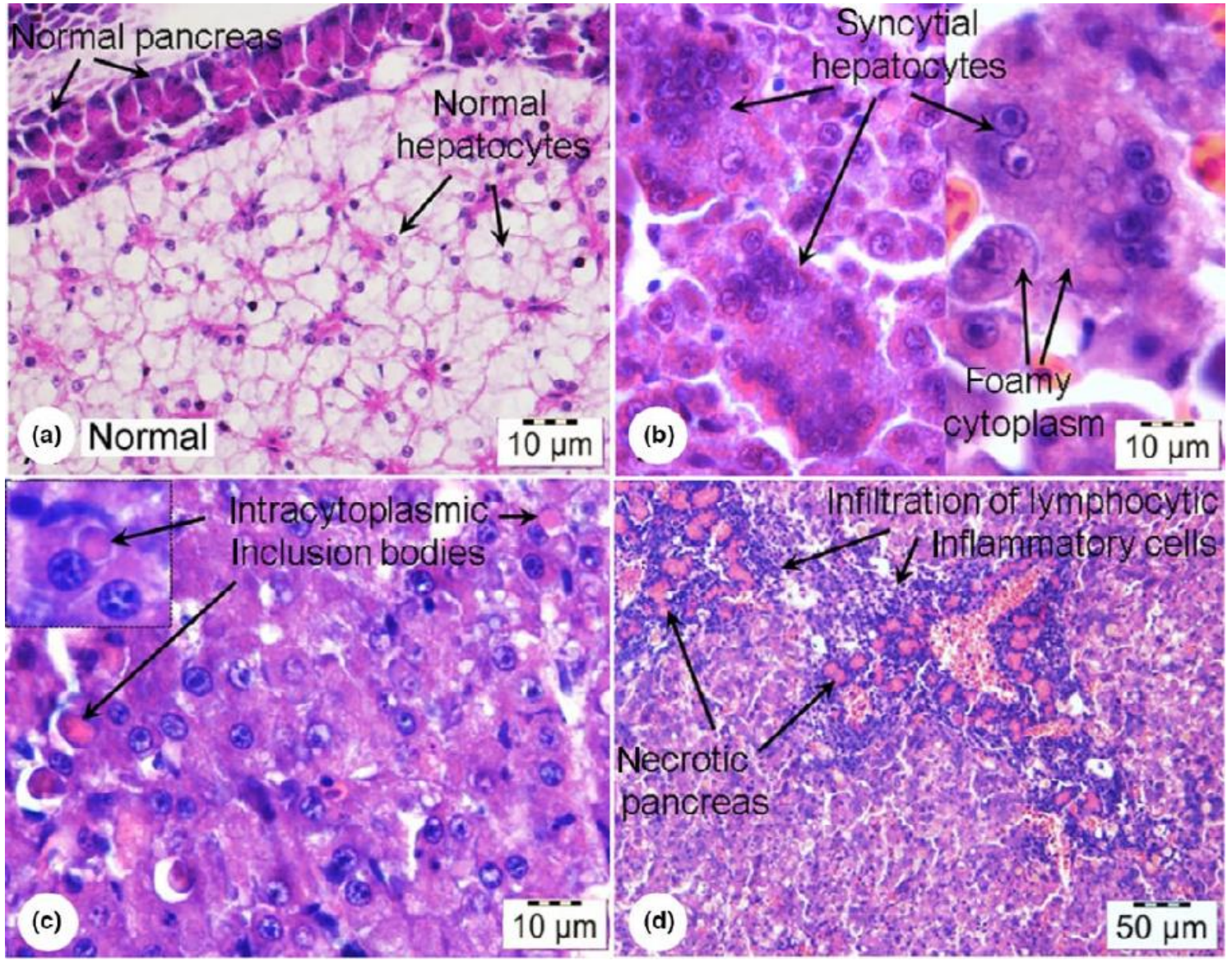
3) A pond/cage where the tilapia show one or more CS: behavioural changes, exophthalmia/ocular lesions, skin erosions, discolouration, skin haemorrhage, scale protrusion and/or abdominal swelling

Viral predilection sites

- Replication and transcription at sites of pathology (ISH)
  - Liver, kidney, gills
  - Brain, spleen, muscle connective tissue

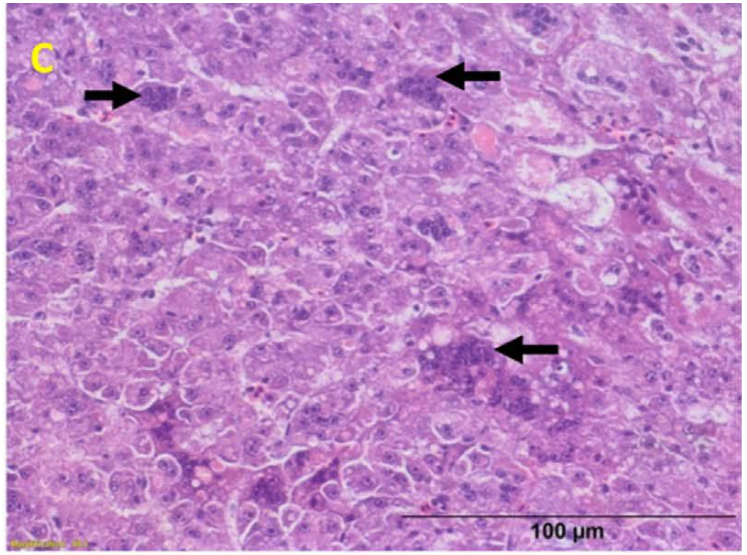
- TiLV RNA prevalence
  - Spleen > head kidney > heart > liver > brain

Liver



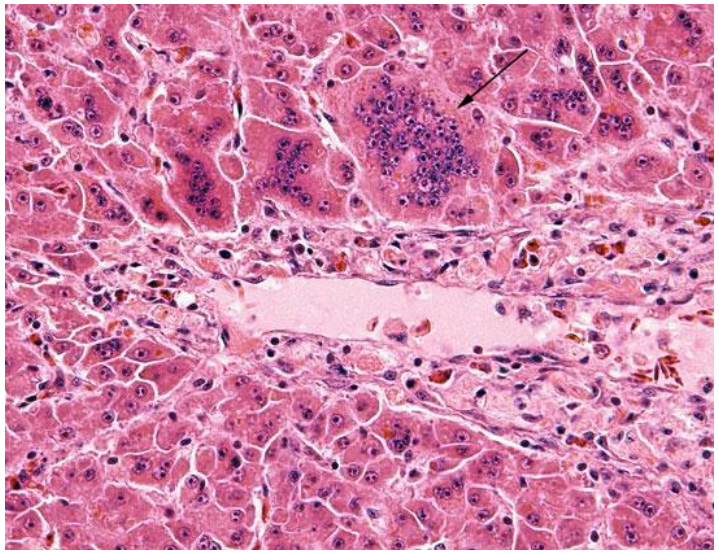
Images by H.T. Dong

Liver



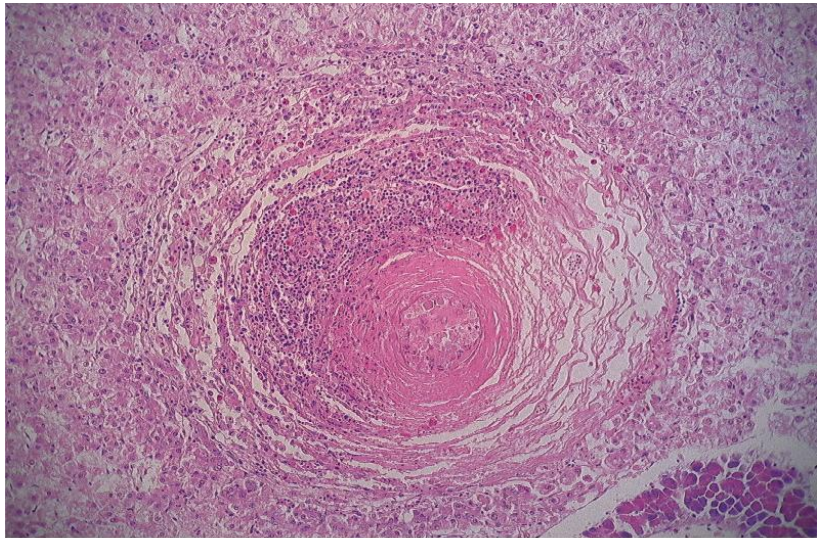
Behera *et al* (2017), India

Syncytial cells



Ferguson *et al* (2014), Ecuador

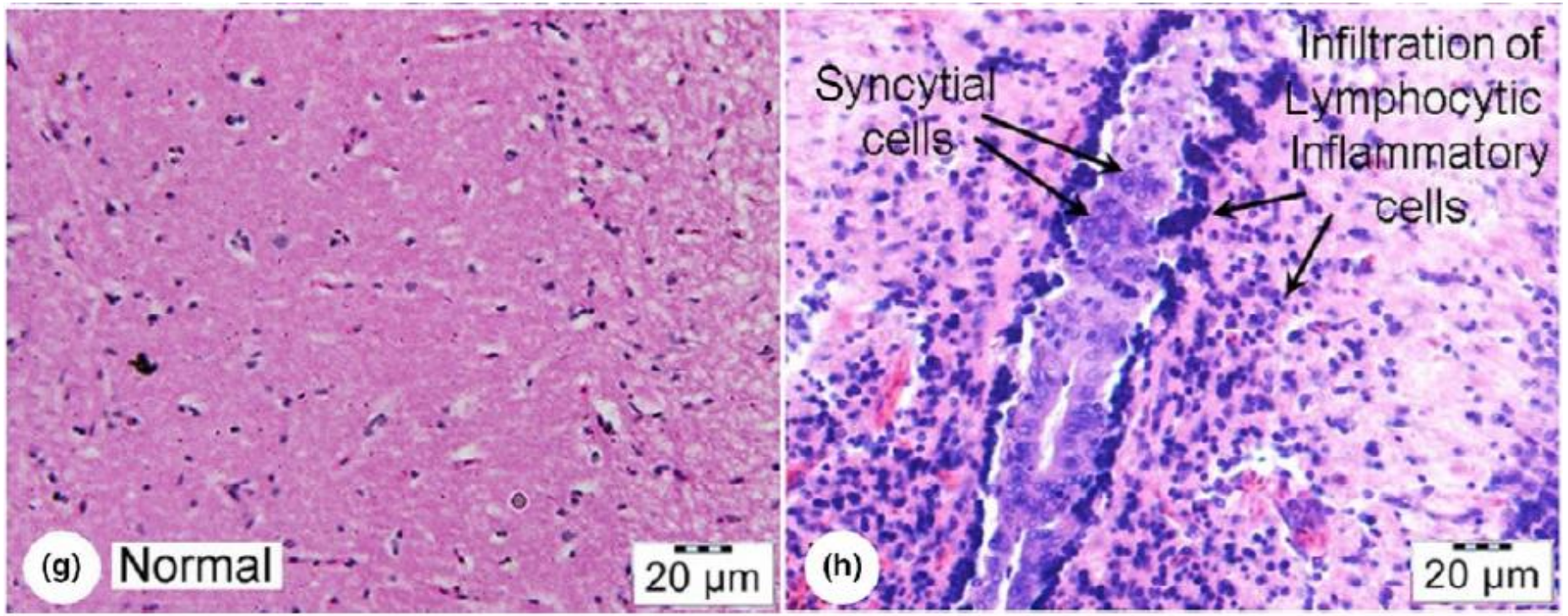
Syncytial cells



Fathi *et al* (2017), Egypt

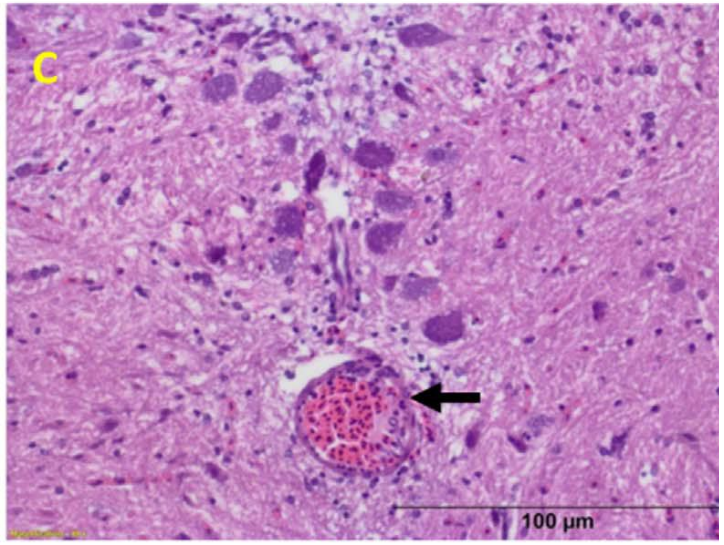
Perivascular hepatitis

Brain



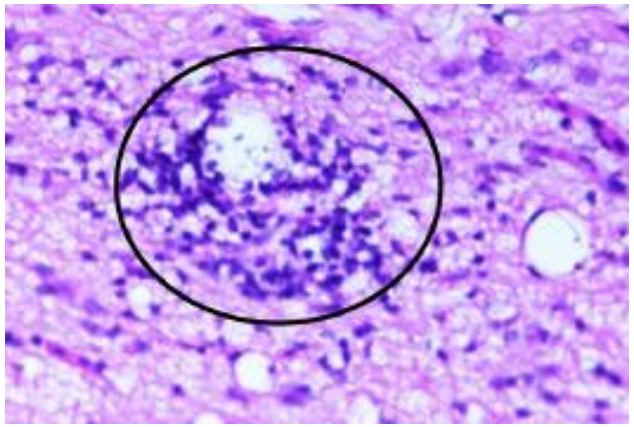
Images by H.T. Dong

Brain



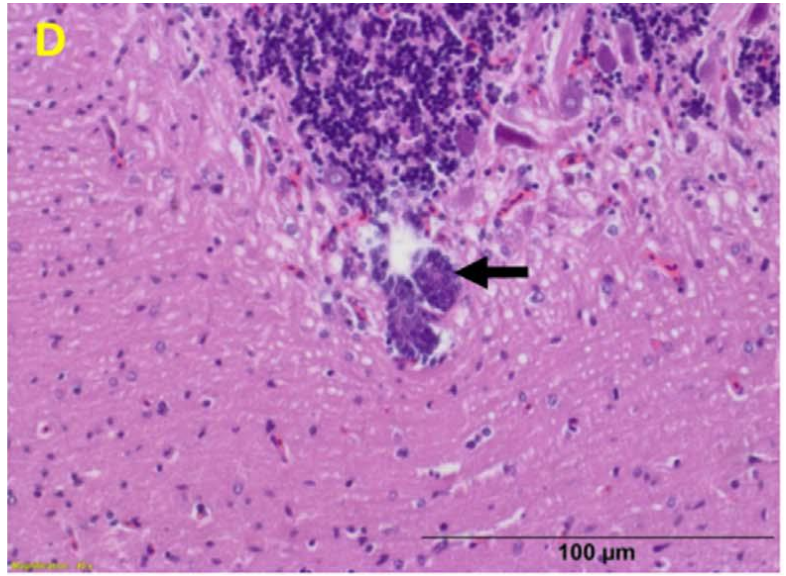
Behera *et al* (2017), India

Congestion



Eyngor *et al* (2014), Israel

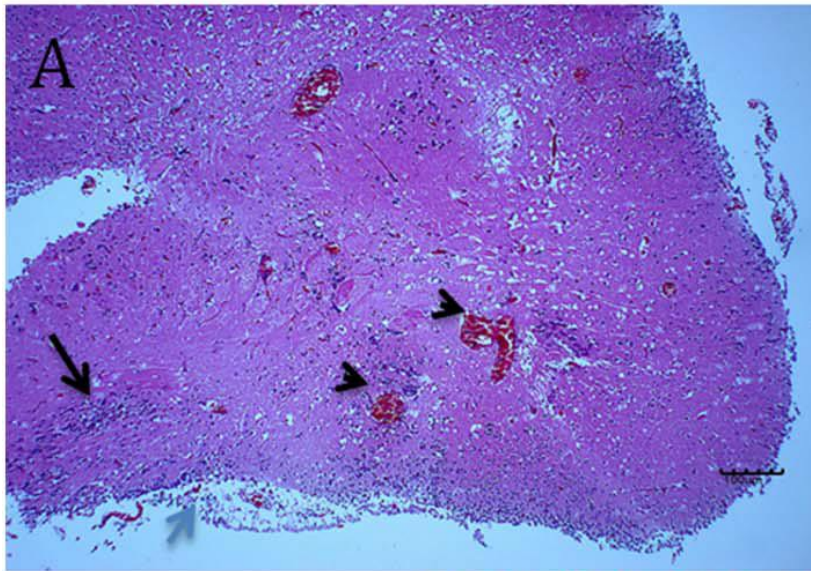
Lymphocytic perivascular cuffs



Behera *et al* (2017), India

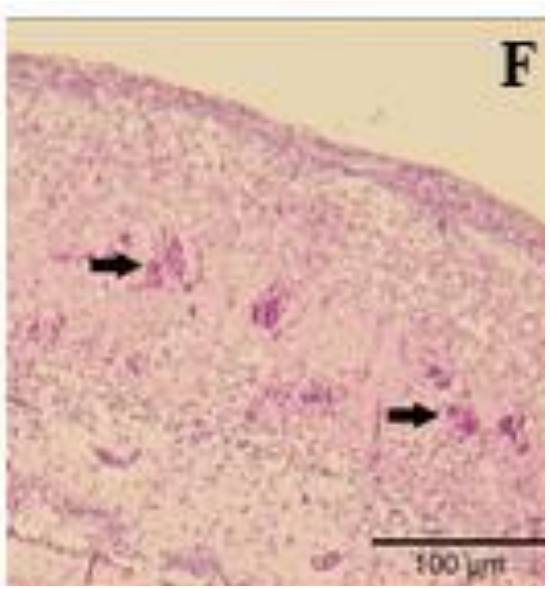
Syncytial cells

Brain



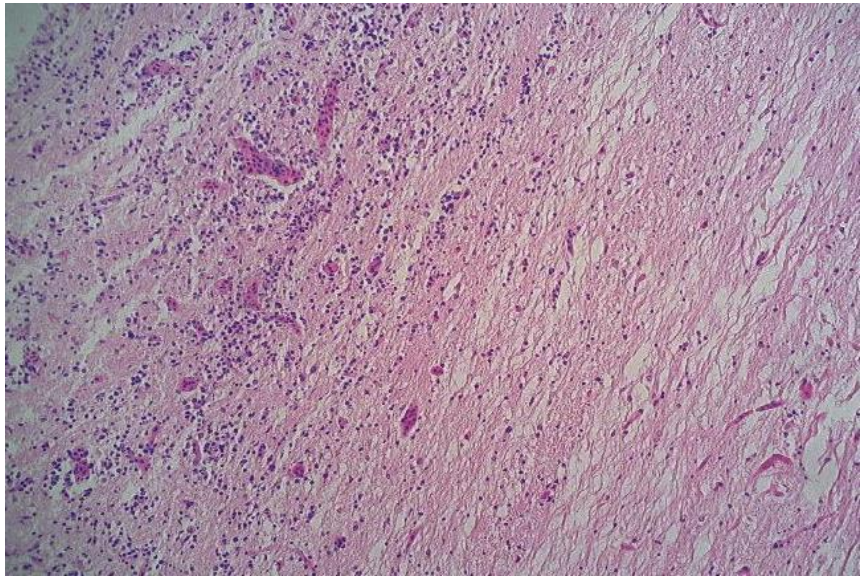
Amal *et al* (2018), Malaysia

Inflammation of leptomeninges
Congestion



Surachetpong *et al* (2017), Thailand

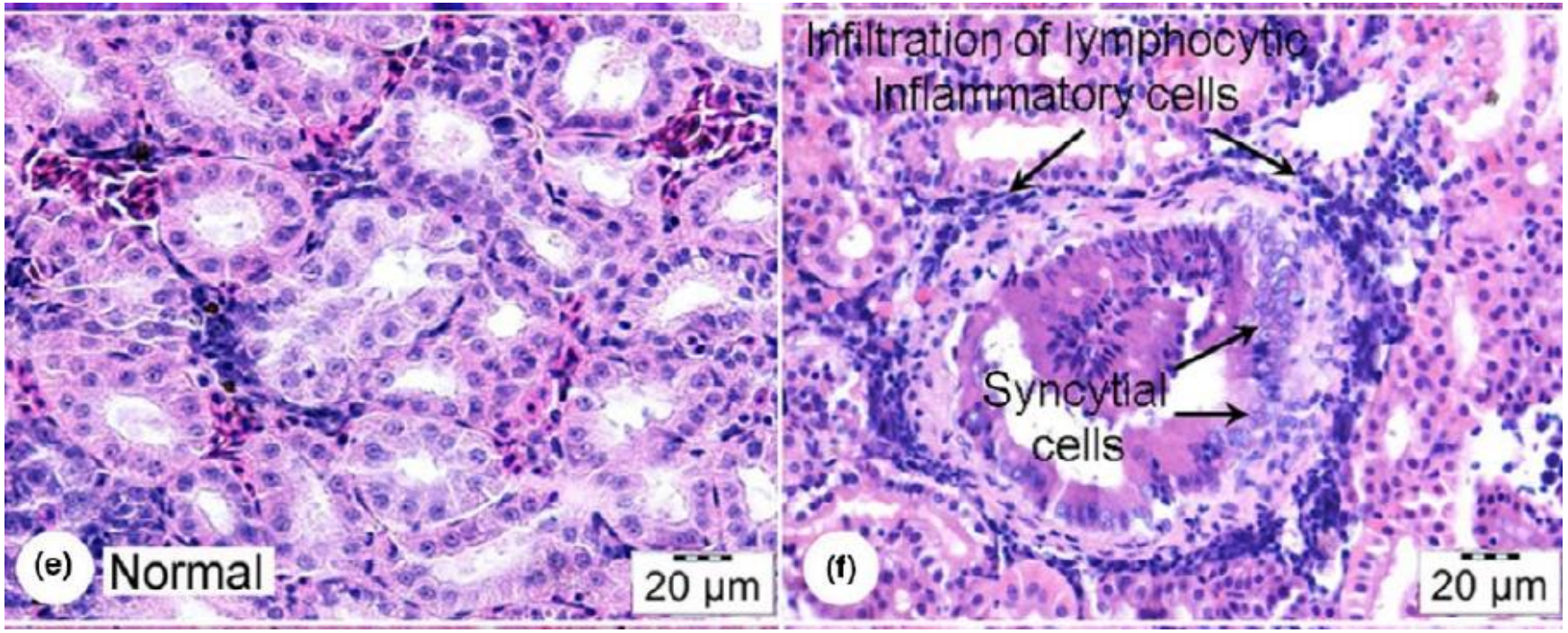
Mononuclear lymphocytes
(-> Suppurative meningoencephalitis)
Haemorrhage



Fathi *et al* (2017), Egypt

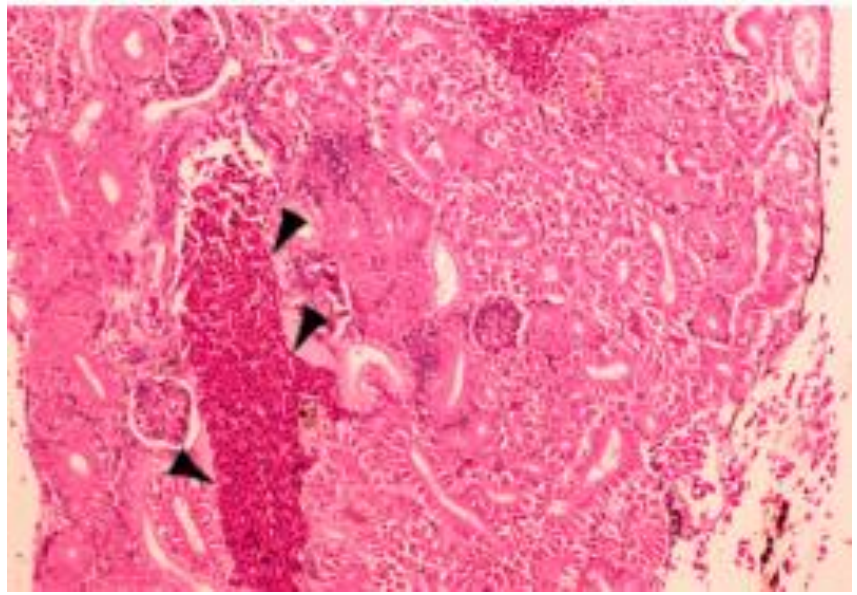
Chronic encephalitis

Kidney



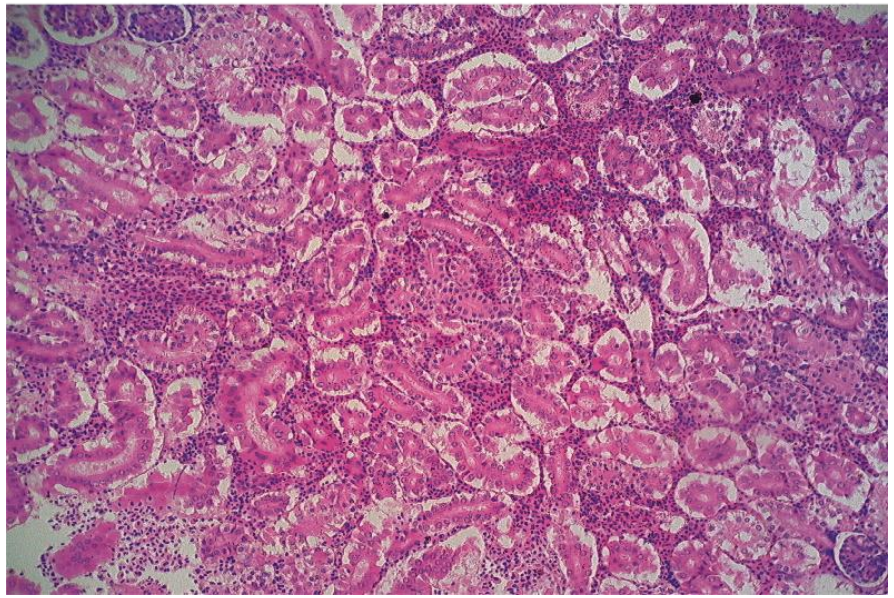
Images by H.T. Dong

Kidney



Eyngor *et al* (2014), Israel

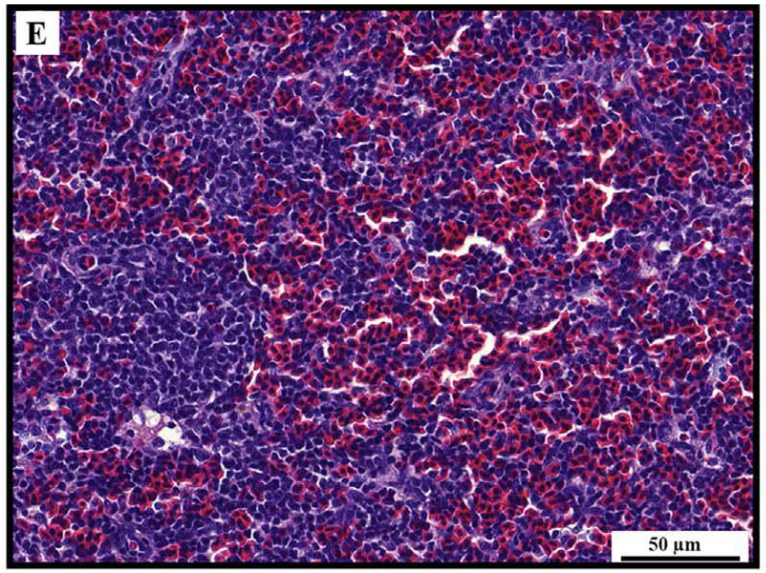
Congestion

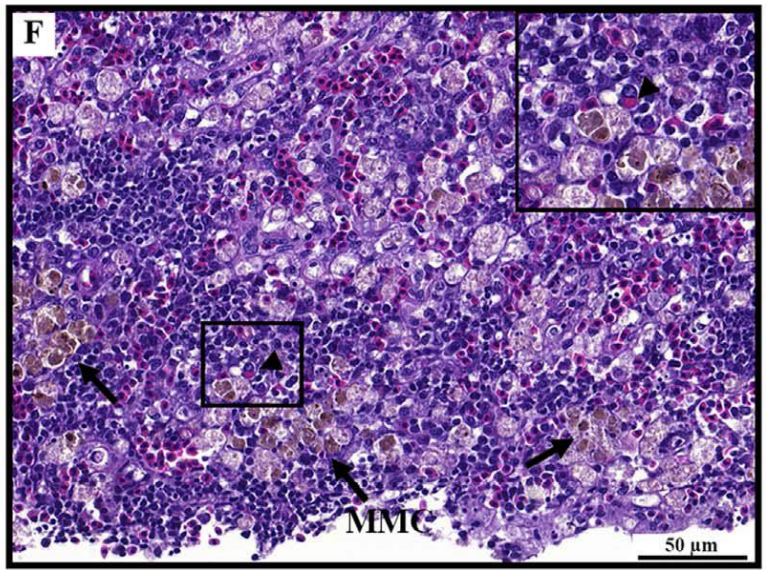


Fathi *et al* (2017), Egypt

Interstitial haemorrhage

Spleen

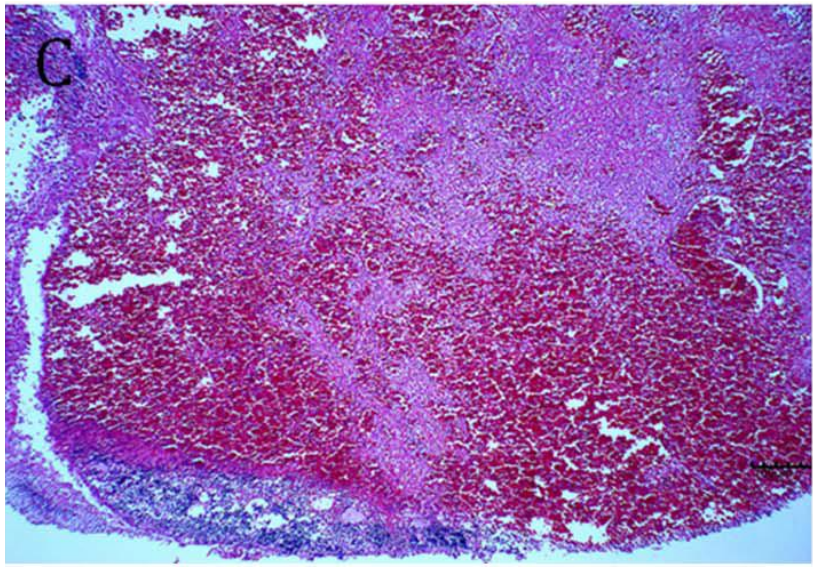




Tattiyapong *et a*l (2017), Thailand

(Normal control)

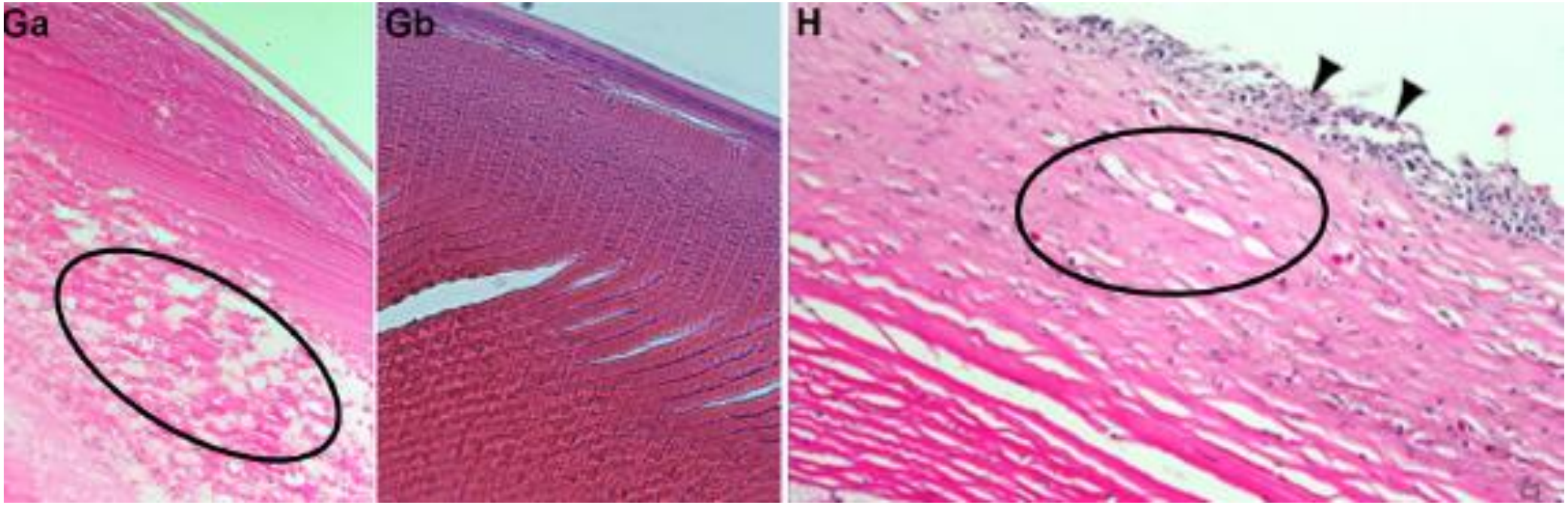
Increased melanomacrophage center
Eosinophilic intracytoplasmic inclusion bodies



Amal *et al* (2018), Malaysia

Haemorrhages
Proliferating lymphocytes

Lens



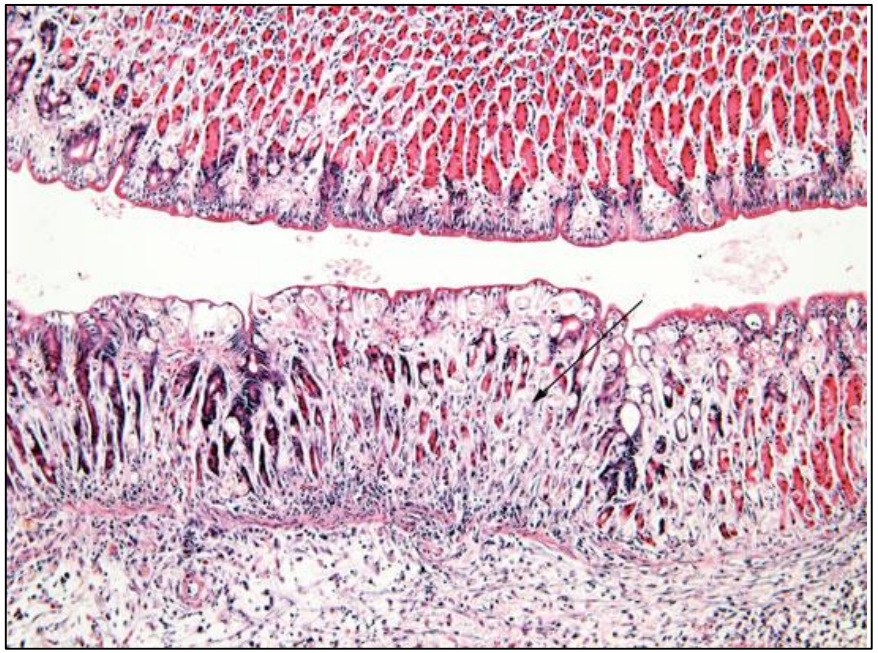
Eyngor *et al* (2014), Israel

Eosinophilic morgagnian globules
Degeerating crystalline fibers

(normal control)

Epithelial inflammation
Neovascularization
General corneal oedema

Stomach



Ferguson *et al* (2014), Ecuador

Loss of gastric glands (lower section)

Most consistent feature?

- According to the literature syncytial hepatitis appears to be the most common, consistent histopathological feature
- Some geographical variation – but limited amount of documentation
- We need more publications or reporting of information (again!)

Suspected case definition suggestions (Jansen *et al* 2018)

1) A pond/cage of tilapia fingerlings/juveniles, increased abnormal mortality 1–4 weeks after stocking, absence of obvious non-infectious causes

Or

2) pond/cage of tilapia subadults/adults with increased abnormal mortality in the absence of obvious non-infectious causes

Or

3) A pond/cage where the tilapia show one or more CS: behavioural changes, exophthalmia/ocular lesions, skin erosions, discolouration, skin haemorrhage, scale protrusion and/or abdominal swelling

4) A pond/cage where at least one tested tilapia show syncytial hepatitis on histopathology

Confirmed case definition suggestion (Jansen *et al* 2018)

A suspected case that subsequently has a positive PCR analysis for TiLV, with subsequent sequencing of the representative PCR product showing TiLV presence.

Requirements and recommendations

- Take the correct samples
- Appropriate sample handling in the field
- All relevant diagnostic tests requested
- Development of a “diagnostic library”

Interactive session to follow

Image: Dreamstime.com

References

- See Jansen *et al* (2018) for overview over mentioned references