

# Eosinophilia in the returning traveller

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# Eosinophilia

- Think in absolute numbers, not in %
- Eosinophilia *defined* as  $> 0.4 \times 10^9/L$
- *Commonly* associated with helminth infection
- *Tends* to be associated with migration of the worm
- Normal eosinophil count *does not* rule out a helminth infection

# Human Helminth Infections

## Cestodes

- *Taenia solium*
- *Taenia saginata*
- *Echinococcus granulosus*

## Trematodes (flukes)

- *Schistosoma* spp
- *Paragonimus* spp
- *Fasciola*, *Clonorchis*

## Tissue nematodes

- *Onchocerca volvulus*
- *Wuchereria bancrofti*
- *Brugia malayi*
- *Loa loa*
- *Mansonella perstans*

## Gut nematodes

- *Enterobius vermicularis* (pinworm)
- *Trichuris trichiura* (whipworm)
- *Ascaris lumbricoides*
- Hookworm
- *Strongyloides stercoralis*

# Parasitic infections that commonly cause eosinophilia:

- *Strongyloides stercoralis*
- *Schistosomiasis*
- *Filariasis*
  - *Wuchereria bancrofti*
  - *Brugia malayi*
  - *Loa loa*
- *Onchocerciasis*
- *Mansonella perstans*

# Parasitic infections that *may* cause eosinophilia:

- Ascariasis (Migratory phase)
- Cysticercosis (Migratory phase)
- Hookworm (Migratory phase)
- Hydatid disease (Leakage from cyst)
- Fascioliasis (Migratory phase)

# Investigations that may be useful

- Stool microscopy (ova, cysts and parasites)
- Terminal urine (*Schisto haematobium*)
- Day & Night bloods (Lymphatic filariasis, Loa)
- Skin snips (Onchocerciasis)
- Serology (Filariases, schistosomiasis, strongyloidiasis, liver flukes)

# Non-infectious causes of eosinophilia

- Allergic disorders
  - Asthma
  - Eczema
  - Drug reactions
- Systemic disorders
  - Vasculitis
  - Inflammatory bowel disease
  - Blistering skin disorders
- Malignancy
  - Especially lymphoma, leukaemia, colorectal carcinoma

# Case History

- 31 year old female, from New Zealand.
- 3 week “adventure holiday to the jungle” Venezuela.  
To UK 18th Jan
- At the end of her stay in Venezuela: 3 days acute, watery diarrhoea, vomiting, abdominal pain. Belching.
- No fever. No cough or wheeze.
- Second episode 5 days later.
- Third episode 1 month later: to HTD on 18th Feb

# Case History

- Wt loss 2kg.
- Lower abdomen/ epigastric pain.
- Bowels open x 7/day
- Past History: mild asthma. No allergies.
- Drug History: discontinued OCP one month earlier
- Examination: upper abdominal tenderness.
- Stool: 2 WBC . No ova, cysts or parasites
- Management: tinidazole 2g stat, repeat after 5 days

# Follow up 7<sup>th</sup> March

- No improvement.
- Sigmoidoscopy: scattered bleeding.
- Rectal scraping–1 RBC 1 WBC.
- Rectal biopsy –prominent eosinophils, no acute inflammation, no amoebae.
- Stool microscopy and culture negative
- Hb 11.6    WCC  $13.9 \times 10^9/l$
- Neutrophils 3.57                      Eosinophils 7.46
- Rx: Ciprofloxacin 500mg bd x 5 days
- WHAT INVESTIGATIONS WOULD YOU REQUEST?

# Investigations

Amoebic IFAT	-negative
Filaria ELISA	-negative
Strongyloides ELISA	-negative
Schistosomal ELISA	-negative
Fasciola IFAT	-negative
Trichinella IFAT	-negative
Toxocara ELISA	-negative
Day bloods	-negative
Night bloods	-negative

# Follow up 20<sup>th</sup> March

- No improvement
- Stool microscopy and culture negative
- WHAT WOULD YOU DO NOW?
- She was given ivermectin 0.2mg/kg stat

# Ivermectin

Treatment of choice for

- Strongyloides
- Onchocerciasis

Highly effective against

- Ascaris
- Trichuris
- Scabies

Less effective against hookworm

# Follow up 26<sup>th</sup> March

- No improvement
- Eosinophils 12.9
- Stool microscopy: Hookworm ova
- Rx: Albendazole 400 mg bd x 3 days

# Follow up April

- 2nd April Eosinophils 0.50
- 26th April Eosinophils 0.10  
Asymptomatic

# Discussion Points

- Keep on sending the stool samples
- Could we have made the diagnosis sooner?
- Could we have relieved her symptoms sooner?
- Should we give empirical anti-helminthic treatment in patients with eosinophilia?
- If so, with what?

## Case 2

- Female aged 28 years from UK
- Working in Uganda for 18 months (Gulu and Kampala)
- Returned to UK May 2008
- Twins delivered by C/S 16<sup>th</sup> July 2008
- Presented to HTD 1<sup>st</sup> October 2008

# History

- Wound infection post –C/S
- Fevers + rigors for 3 weeks post C/S
- Rx cefuroxime + metronidazole

Early September

- Fever and rigors for 5 days. No cause found

Mid September

- Fever, sore throat, runny nose, cough
- Occasional loose stools

# Examination

- Well
- Breast feeding
- Afebrile
- Pulse 110 regular BP 120/80
- Chest clear
- Abdo: Caesarean scar. Nil else abnormal

# Investigations

- HB 10.1 WCC 6.6 Eos 1.8 CRP 32
- LFTs normal apart from Alk Phos 175 (35–104)
- Malaria film negative
- Stool: *Blastocystis hominis*. Culture negative

## Serology

- Schisto negative
- Strongyloides negative
- Filaria negative

CXR normal

# Follow up 15<sup>th</sup> October

- Cough less. No sputum.
- Occasional night sweats
- Bowels normal
- Pain below ribs on right past 2 days
  - Worse on bending
  - Worse on deep inspiration

## Examination

- Well. Afebrile.

## Abdomen

- Tender right upper quadrant
- Liver not palpable but increased area of dullness RUQ

# Investigations 15<sup>th</sup> October

- HB 9.4, WCC 7.8, eos 2.6
- ESR 131, CRP 35
- Alk phos 147 (35-104)
- Stool microscopy: No ova, cysts or parasites
- Abdominal ultrasound requested
- Further serology requested
- Rx: albendazole 400mg daily 3 days

# Follow up 29<sup>th</sup> October

- Rash on legs with oedema after albendazole
- RUQ and shoulder tip pain past 2 weeks

## Examination

- Afebrile
- Chest clear
- Tender enlarged liver
- Spleen tip

LIVER RL



4C1-S  
H4.5MHz 200mm  
Abdomen  
NTHI General  
81dB S1/+1/3/3  
Gain= 15dB Δ=2  
Store in progress



# Serology

- Amoebic negative
- Toxocara negative
- Trichinella negative
- Cysticercus negative
- Schisto borderline positive
- Fasciola positive 1:512

# 29<sup>th</sup> October

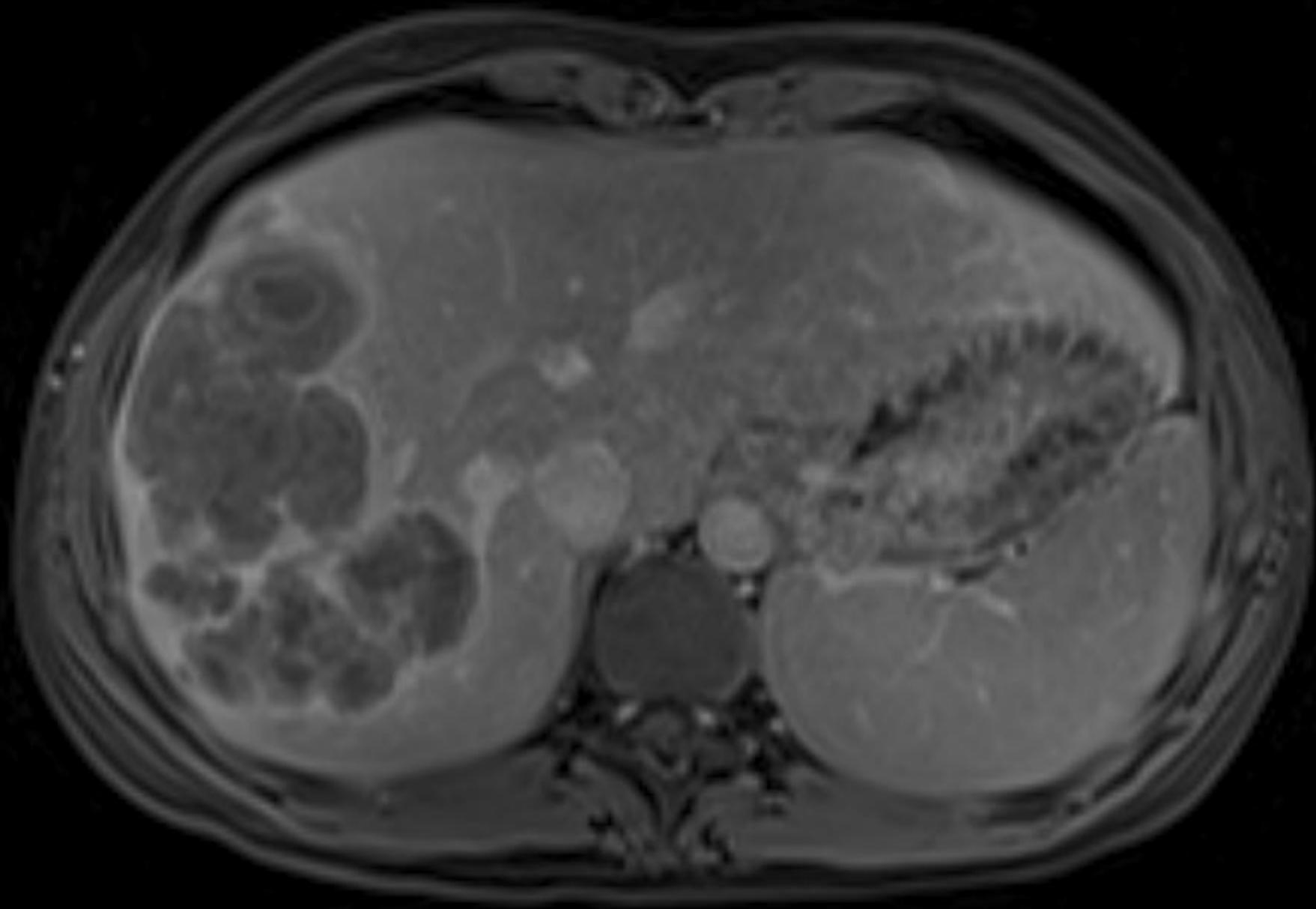
- Hb 9.7, WCC 8.3, eos 2.4
- CRP 49, ESR 131
- Alk phos 137
- WHAT WOULD YOU DO NOW?
- She was given praziquantel 20mg/kg stat, to repeat in 6 hours

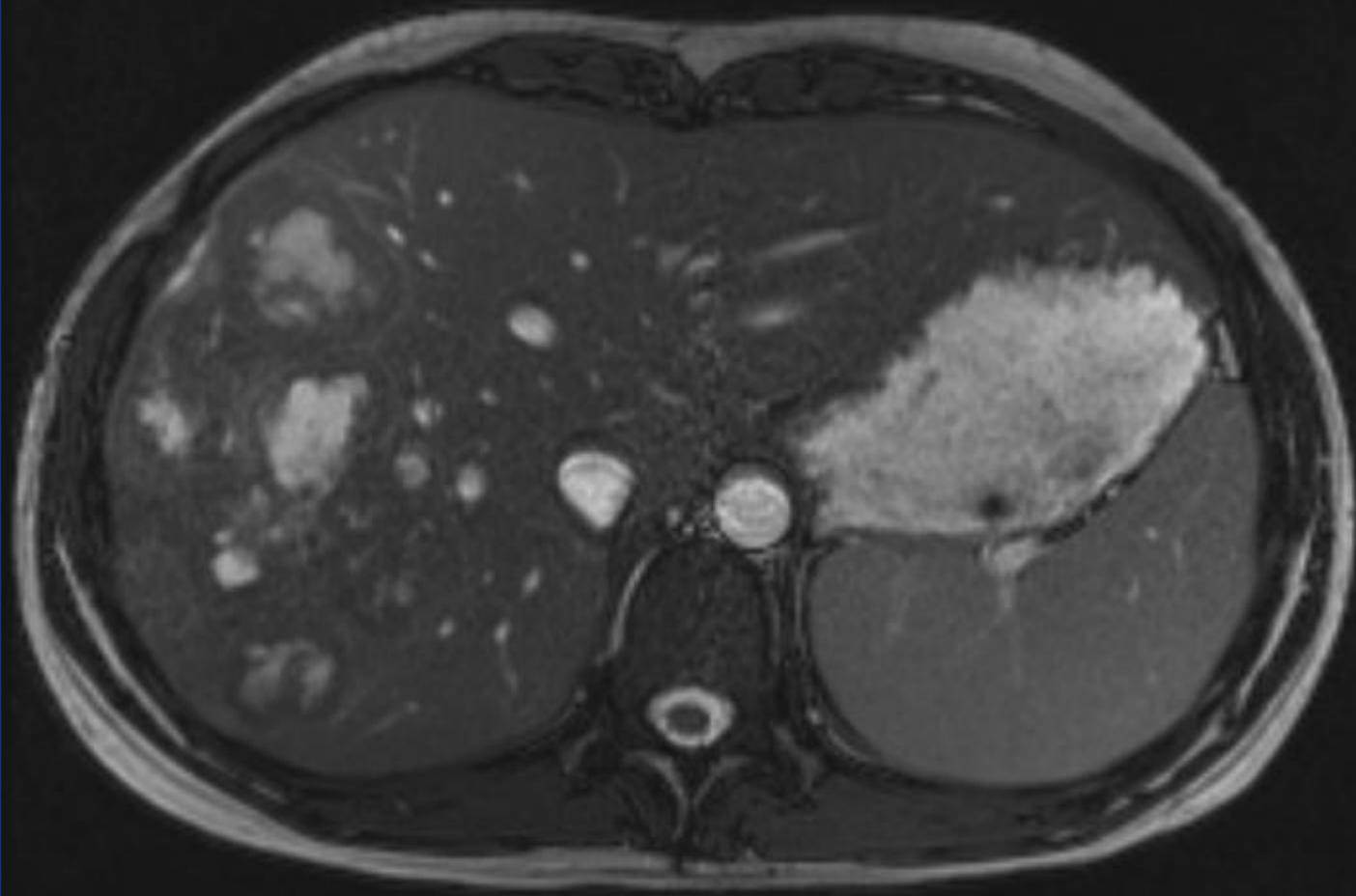
# Follow up 19<sup>th</sup> November

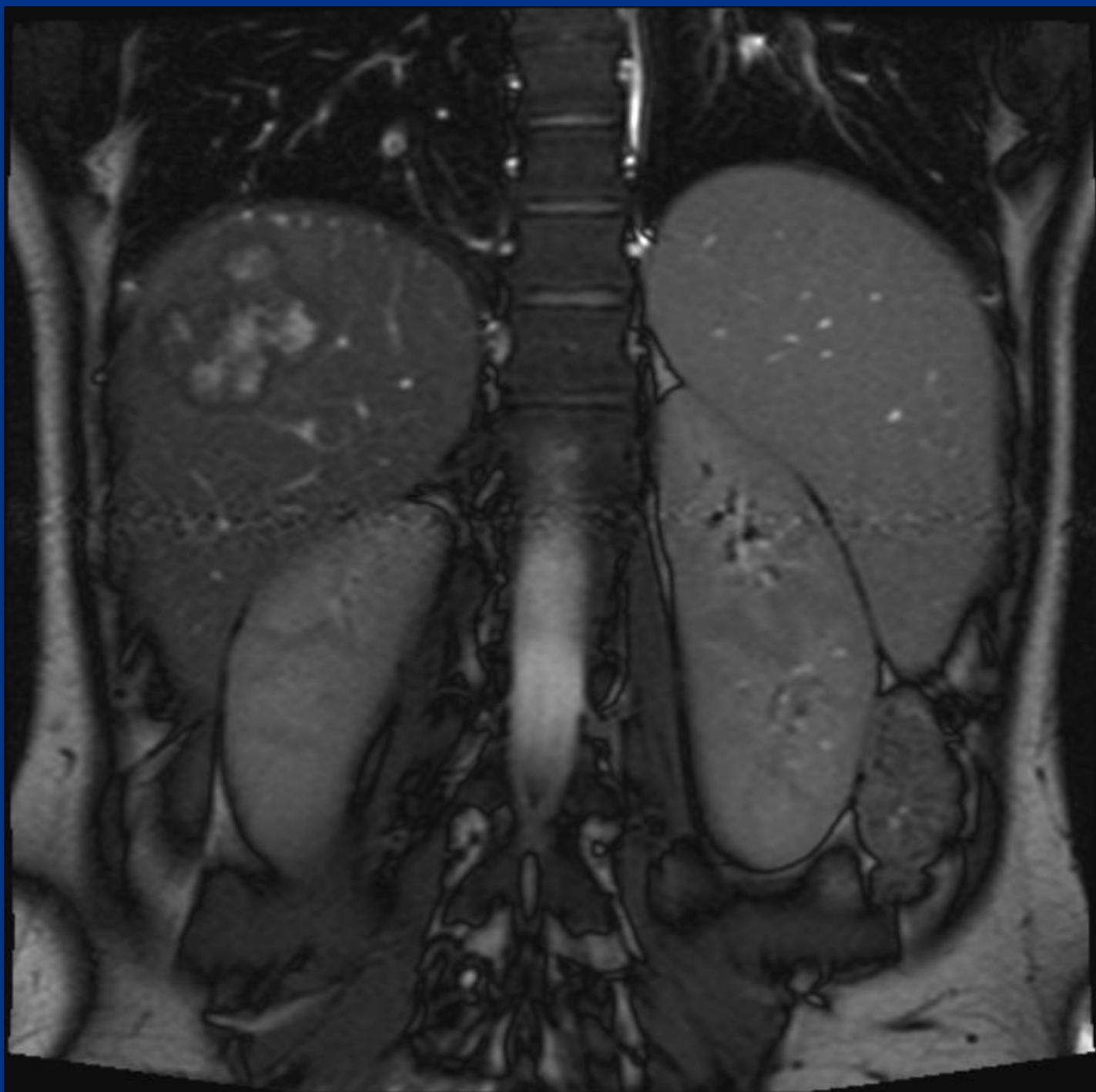
- Better
- No RUQ or shoulder tip pain in past week
- Had rash on legs with oedema after taking praziquantel

## Examination

- Liver not palpable
- No tenderness
- Spleen tip
- Rx: triclabendazole 600mg x2







# Follow up 7<sup>th</sup> January

- No symptoms
- Did not take triclabendazole

## Examination

- Entirely normal

## Investigations

- Hb 12.2, WCC 4.3, eos 0.45
- CRP 7, ESR 23
- LFTs normal
- Serology: Fasciola 1:128, Schisto level 3

# Follow up 8<sup>th</sup> April

- A bit tired past two weeks
- Runny nose. No pain or cough
- Still breast feeding

## Examination

- Spleen tip
- Otherwise normal

## Investigations

- FBC, differential, ESR, CRP, LFTs all normal
- Fasciola serology 1:64
- Rx: triclabendazole



10<sup>th</sup> July

# *Fasciola hepatica*

- A parasite of sheep
- Life cycle involves a snail intermediate host
- Humans infected by eating vegetation contaminated by metacercariae
  - Usually watercress in UK
  - Case reports in Somalis who chew khat
    - *Doherty et al. Lancet 1995; 345: 462*
- 90 million people at risk
- Between 2 and 17 million infected
- Found in all continents

# Clinical Features

## Acute stage

- Dyspepsia, malaise, fever, anorexia, urticaria, respiratory symptoms, RUQ pain
- Hepatosplenomegaly, ascites, jaundice

## Chronic stage

- Nausea, epigastric pain, biliary colic, intermittent jaundice, cholangitis, cholecystitis, pancreatitis

# Treatment of *Fasciola hepatica*

- Triclabendazole 10mg/kg stat
  - 80-90% cure rate
- Triclabendazole 10mg/kg x2
  - >95% cure rate

*Keiser J et al. Expert Opin Investig Drugs 2005;14: 1513*

- Resistance reported in sheep

*Brennan et al. Exp Mol Pathol 2007; 82: 104*

# Parasitic infections that commonly cause eosinophilia

- *Strongyloides stercoralis*
- *Schistosoma* species
- *Wuchereria bancrofti*
- *Brugia malayi*
- *Loa loa*
- *Onchocerciasis*
- *Mansonella perstans*

# *Strongyloides stercoralis*:

- Small intestine
- 0.2 cm long
- Penetrate skin → lungs → throat → small intestine
- Rhabditiform → filariform larvae
- Auto-infection → persistence +++
- Hyperinfection syndrome in immunosuppressed: eosinopenia

# Larva currens - Strongyloidiasis:



# Case History

- Afro-Caribbean male aged 39 years
- Born Grenada
- Moved to UK aged 12 years
- RUQ/epigastric pain 2 months
- Examination: Epigastric mass

# Investigations

- U/S: Multiple conglomerate loops of small bowel with thickened walls and thickened overlying omentum
- CT: Large mass arising from pancreas, involving bowel and mesentery. Mediastinal nodes, pleural effusion, pelvic mass in front of bladder
- Ascitic tap: High grade T cell lymphoma

# Investigations and Management

- HTLV 1 positive
- HIV negative

30/4: Chemotherapy started (CHOP)

Diarrhoea but ascites and pleural effusion resolving

22/5 and 12/6: Second and third courses of CHOP

19/6: Headache, nausea vomiting

LP: 400 WBC, mainly PMNs Rx cefotaxime

# Clinical Course

26/9: Paralytic ileus. IVI, NG tube

3/7: OGD: severe duodenal erosions, nodular appearance. ?recurrent lymphoma

4/7: RUQ pain, persistent ileus

CT: Probable perforation. Necrotic mass around duodenum

9/7: Repeat OGD: widespread abnormal gastric and duodenal mucosa: ? lymphoma

# Clinical Course

## Biopsy:

Invasive strongyloides. No evidence of lymphoma

## Laparotomy:

Dilated small bowel, grossly thickened and inflamed

Huge necrotic glands around D-J flexure

No perforation or abscess

17/7: Rx: Ivermectin on days 1,2,15,16

# Clinical Course

28/7: No bowel sounds

Strongyloides in stool, urine and sputum

CXR: Diffuse pneumonitis

Rx: Daily s/c ivermectin

2/8: Died

# Invasive strongyloides

- Seen in people with Strongyloides infection who are started on immunosuppressive treatment
- Not associated with HIV
- Larvae penetrate bowel wall, causing gram negative sepsis
- High mortality

# Remember strongyloides

- A common, often lifelong infection
- Usually asymptomatic
- Associated with eosinophilia
- Easy to diagnose (serology or stool microscopy)
- Easy to treat (ivermectin or albendazole)
- Can be fatal in those given immunosuppressive treatment