LEARN THE KEYS TO DIFFERENTIATE PARASITES FROM ARTIFACTS
PRESENTED

BY

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FACT OR ARTIFACT

- Many body sites and specimens can be examined for parasites.
- The most difficult specimen to differentiate parasites from artifacts is fecal material.
- Feces consists of many components, which include:
Cont’d

- Undigested food residue
- Digestive by products
- Epithelial cells
- Microorganisms (bacteria & yeasts)
- Secretions from the digestive tract
Cont’d

- Due to the ratio between fecal debris and parasites, many artifacts have been incorrectly identified as:
  - Protozoan trophozoites & cysts
  - Helminth eggs & larvae
Minimizing the Errors

- Appropriate training (maintenance of competency)
- Adherence to protocols
- Use of quality control measures
- Availability of reference materials
- Availability of consultants (ProvLab)
- Involvement in Proficiency program
Fact or Artifact?
Fact or Artifact?
Pencil Sketch
Close-up View

- Note the short buccal cavity & the prominent genital primordium that distinguishes it from hookworm.
- In hookworm the (bc) is long & the (gp) is inconspicuous.
Side by Side

- Strongyloides larva
- Plant hair
Consequences of Error

- Strongyloidiasis
- Larvae normally very scant in feces, many infections go undiagnosed
- Infections are frequently latent
- Hyperinfection due to “autoinfection” (could be fatal)
- Patients from endemic areas selected for immunosuppressive therapy should be screened for this infection.
Fact or Artifact?
Fact or Artifact?
Pathogenic or not?

- T. hominis is pyriform has both an axostyle & undulating membrane. The membrane extends to the entire length of the body, in contrast to that seen in T. vaginalis.
- Note the large anterior nucleus and the four anterior flagella of T. vaginalis.
Compare!!

Epithelial cell

flagella

*T. hominis*

*T. vaginalis*

*T. vaginalis*
Consequences of Trichomoniasis

- Vaginal infections in female
- Infections of the prostate and the epididymis in males
- *T. vaginalis* infection is an important STD disease throughout the world.
- *T. hominis* is non-pathogenic
Fact or Artifact?
Fact or Artifact?
Fact or Artifact?
Fact or Artifact?
Fact or Artifact?
E. histolytica/dispar & Artifacts

Pencil Sketches

E. coli

PMN’s

macrophage

PMN’s
Both Stages of E. coli

- Note the large diffuse eccentric karyosome
- Peripheral chromatin is block-like
- Cytoplasm is vacuolated
- Note the cyst with seven of its eight nuclei.
- A chromatoidal body(cb) is also present
Phases of *E. histolytica/dispar*

- **Trophozoite**
  - Karyosome

- **Cyst (2 nuclei)**

- **Cyst (bar & 4 nuclei)**

- **Cyst with chromatoid bar**
Fact & Artifact!!

- Macrophage
- WBC
- E. histolytica/dispar troph
- E. histo.dispar (cyst)
Consequences of E. histolytica

Amebiasis (amebic dysentery)
Ulcers in the lumen of colon and cecum

Tissue envasion may involve colon & extraintestinal locations (liver, lung, brain, skin & other tissues).
Fact or Artifact?
Fact or Artifact?
The Giardia troph exhibit the pyriform shape & two anteriorly placed nuclei, located on either side of the axonemes.

The dark stained median bodies are also visible below the nuclei. Because they stain poorly, flagella are rarely seen.
Fact and Artifact!

- Spore
- Giardia troph
- Giardia cyst
- T. hominis
Consequences of Giardiasis

• Trophozoites colonize the upper intestine & penetrate the mucosa and attach to the underlying epithelial cells
• Infection range from asymptomatic ----severe diarrhea
• Host factors play a role in the pathogenesis of the organism
• Usual symptoms are cramps & diarrhea, prolonged infections may result in malabsorption
Fact or Artifact?
Fact or Artifact?
Description

Note the thick radially striated shell, containing a six hooked embryo (oncosphere).

This pollen grain has a similar type of shell and could resemble a *Taenia sp.*
Fact or Artifact

- Pencil sketch
  - Image a
  - Image b

- Pollen grain

- Taenia ova

- Triple threat
Consequences

- Taeniasis or beef tapeworm (*T. saginata*)
- Taeniasis or pork tapeworm (*T. solium*)
- The eggs are identical for both species.
- (A)-The eggs of *T. solium* are infective to humans, and may cause human cysticercosis if ingested.
Consequences

- Close up view of a Cysticerci caused by *T. solium*.
- It can measure up to 1 cm in diameter.
- Any body tissue can harbour the cysticerci (cerebral is the most common site).
Fact?
Fact?
• A. *Plasmodium falciparum* rings: multiple rings per cell are typical of *P. falciparum* than the other species of malaria

• B. Babesia rings: “Maltese cross” arrangement when present is diagnostic for *Babesia sp.*
Fact or Artifact?

- platelet
- Babesia sp.
- *P. falciparum* gametocyte
Consequences of Malaria

- Malaria caused by *Plasmodium falciparum* can be a life threatening disease.
- It is considered a medical emergency, and it is necessary to facilitate rapid and proper laboratory diagnosis.
- The potential fatal outcome is related to cerebral malaria and multiorgan failure.
- It is essential to distinguish between *P.falciparum* and the non-falciparum species due to specific therapeutic needs.
- Especially the wide spread drug resistance among *P.falciparum* strains.
Fact or Artifact?
All Fact!

- Cyst
- Group of mature cysts
- Starshaped cyst
- Acanthopodia
- Trophozoite
Consequences of Acanthamoeba Infection

Contact lens wearer showing early stage of infection
Consequences of Acanthamoeba Infection

Final outcome can be loss of sight
Consequences of Acanthamoeba Infection

Acanthamoeba isolates vary in sensitivity to antimicrobial agents

Sight can be lost in spite of combination drug therapy
A corneal transplant in this eye is the final attempt to restore sight.
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Fact or Artifact – can you identify this?
Answer: Fact!

Broken *Ascaris lumbricoides* ova