

# What is normal ?

## A tale of bilharziasis in a rural village in Kenya

In rural villages of east Kenya, bilharziasis (*Schistosoma haematobium* infestation) is heavily prevalent. The infection is transmitted by the larval parasite (cercaria) penetrating through the intact skin, finally to result in adult fluke colonization in the pelvic veins. The ova are secreted through the urine together with gross hematuria. The adult worms can survive in the vein for decades. Most children playing in the local field inevitably suffer from the infection, and they manifest hematuria around the age of 12 years. Neither pain nor fever is associated. When the girls and boys present with gross hematuria, the families celebrate them as the evidence of adulthood. Importantly and seriously enough, they do not recognize that the hematuria is caused by infection, because the children can keep health and almost all of the adults have experienced gross hematuria. Hematuria is a “normal event” in the village!

**Ref.:** A lion standing in the wind and everydayness of death. Igaku-no-Ayumi 1994; 171(9): 75841 (in Japanese)

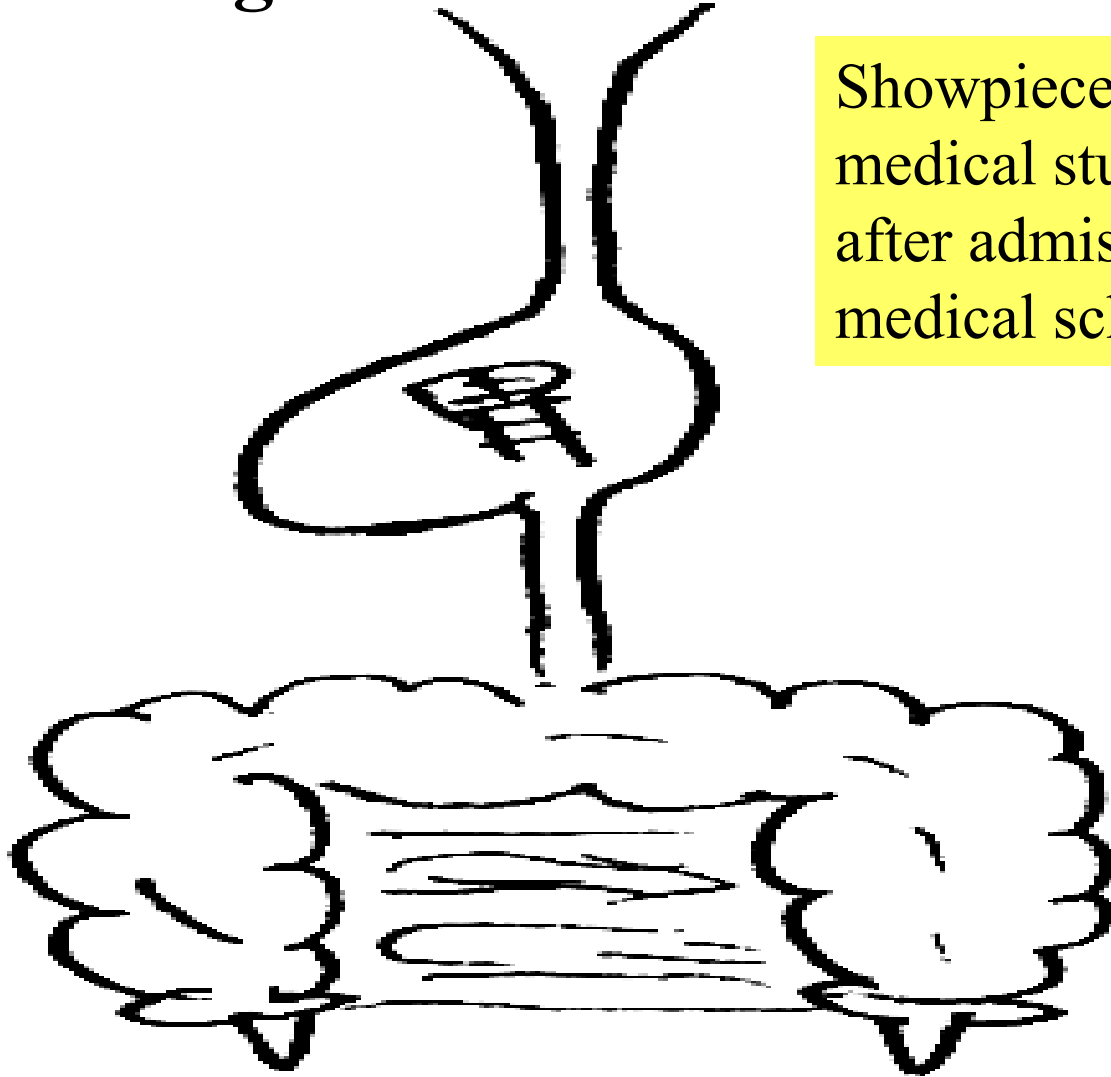


Note that da Vinci sketched **an imaginary string-like connection** between the uterus and breast.

**Anatomy during sexual intercourse by Leonardo da Vinci (1452-1519)**

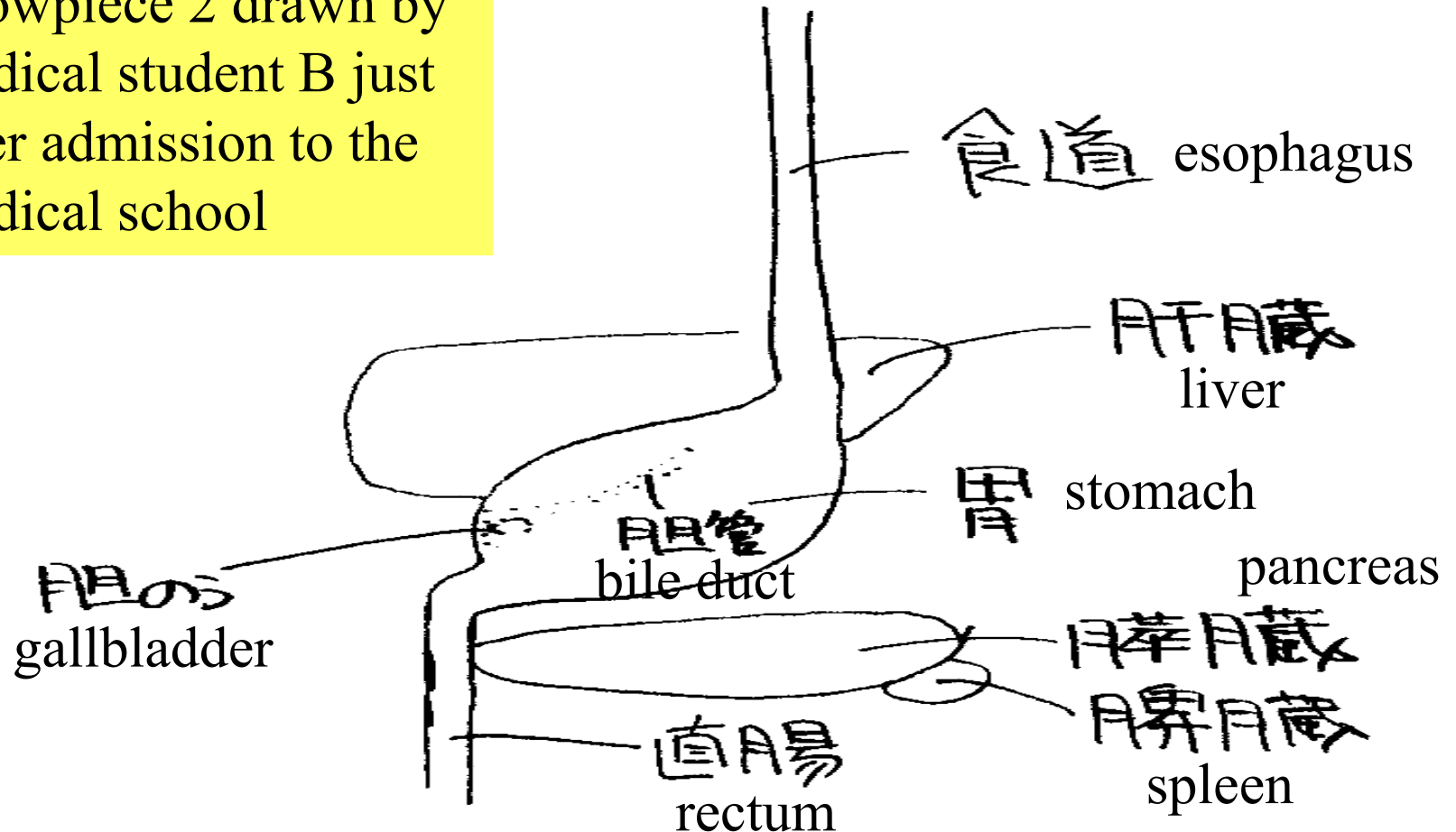
# Anatomy of the gastrointestinal tract

Showpiece 1 drawn by  
medical student A just  
after admission to the  
medical school

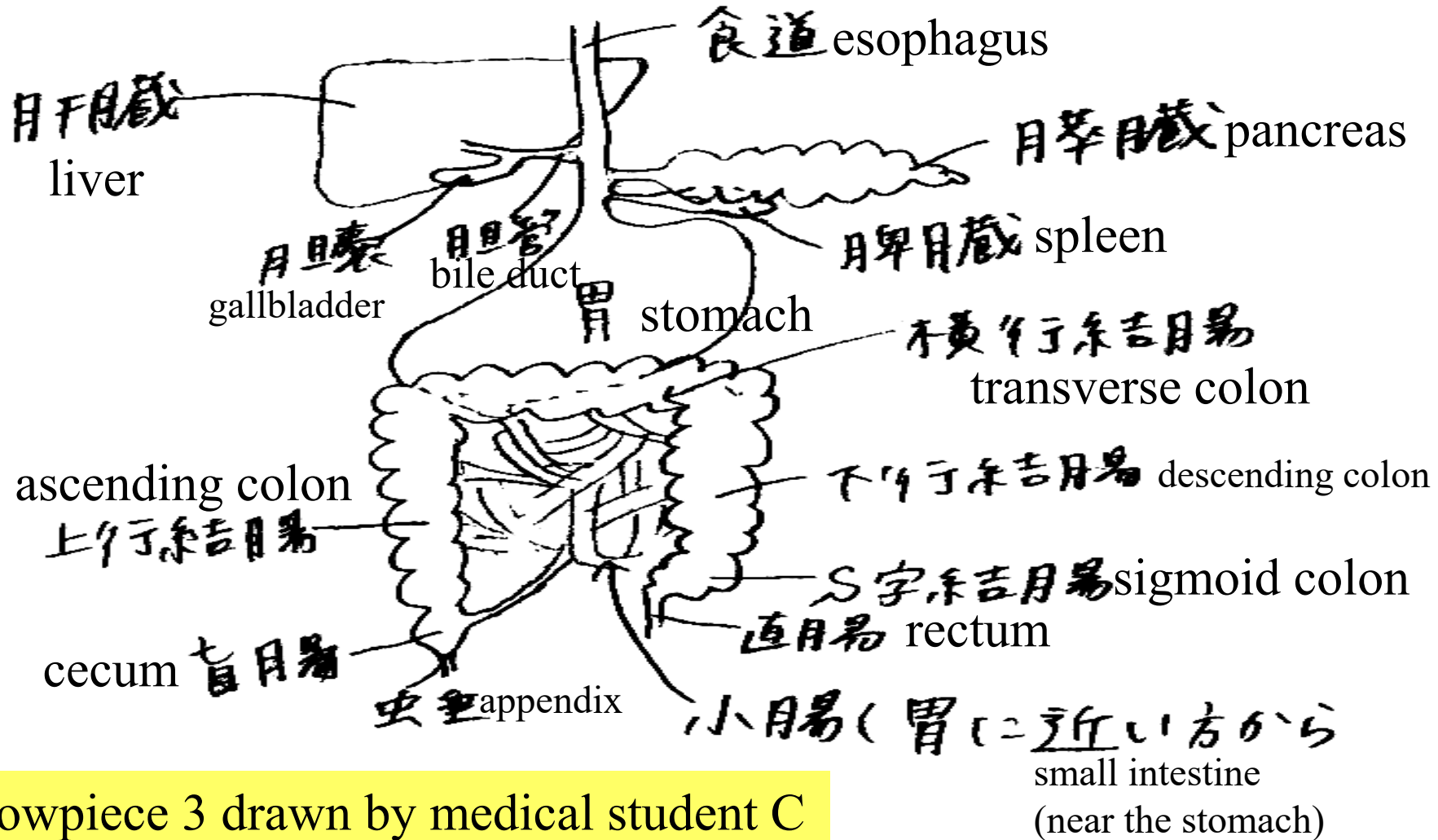


# Anatomy of the gastrointestinal tract

Showpiece 2 drawn by  
medical student B just  
after admission to the  
medical school



# Anatomy of the gastrointestinal tract



Showpiece 3 drawn by medical student C  
just after admission to the medical school

# Definition of normal state

Dictionay says: the normal is a state comparable and invariable with others, and the absence of uncontrollable issues.

- 1) How about Mr Gulliver in Lilliput?
- 2) How about aged persons without wrinkles?
- 3) How about wild animals without intestinal parasites?



Kilimanjaro in twilight time





Coast of Mombasa facing to the Indian Sea





ライオンに襲われたカバ

A hippopotamus attacked by lions in savannah



Ladies in a small rural village in east Kenya  
standing in front of an elementary school





The classroom of the elementary school in rural Kenya. No desk, no chair, no light and plentiful stones.

## 小学校の女子用トイレ



A washroom for girls outside the school. One of my colleagues stands in front of the secret room. There was no washroom for boys.





Children of the second-year class in the elementary school.

# カシューナッツの 実をもつ小学生



An elementary school boy handing a cashew nut. The nut was gained by throwing stones! The cashew nut gives us safe water.



The urine was sampled from the second- and seventh year class elementary school pupil. Some urine contains blood, caused by bilharziasis. The incidence of gross hematuria is much higher in the 7<sup>th</sup> year pupil than in the 2<sup>nd</sup> year pupil.





Ovum of *Schistosoma haematobium* in the urine of a Kenyan boy. A large 150  $\mu\text{m}$ -long spiculated egg contains miracidium. Red blood cells and leukocytes are seen around the egg (unstained preparation).



Ovum of *Schistosoma haematobium* in the urine of a Kenyan boy. A large 150  $\mu\text{m}$ -long spiculated egg contains multinucleated miracidium. Red blood cells and leukocytes are seen around the egg (Papanicolaou).





Procedures against bilharziasis.

- 1) Removal of the grass
- 2) Digging down the base of the stream with a shovel

These procedures can prevent the survival of snails, the intermediate host of *Schistoma haematobium*.





The pond is the water source for villagers. However, the turbid water is full of wigglers (mosquito larvae) and snails. Both malaria and schistosomiasis are endemic in this area.



A huge footprint of an elephant seen beside the pond.





A baobab tree knocked down by a stray/rogue adult male elephant.





A row of malaria patients waiting for lab testing, in front of a branch office of the state hospital.



A trial of digging a well to save safe water. The trial often failed because of the presence of a big bedrock underground. How to keep safe water is the important agenda in rural Africa.





Ladies gather from the village far away from the water source prepared by JICA (Japan International Cooperation Agency). They have a bucket on the head to carry water back home.





Rice plant growing on the Savanna ground has little firs, and the firs are often empty. People can not get enough rice harvest.

# Agricultural and medical supports for Kenya by Japan

The agricultural support is highly recognized by the Ministry of Foreign Affairs of Japan.

Paddy fields are efficiently developed in the Savanna area to get consistent rice harvest.

As a result, however, the developed rice fields full of water cultivate wigglers (mosquito larvae) and snails to allow prevailing malaria and schistosomiasis in the village.

This necessitated additional new medical support, and agricultural supporters do not know the resultant infectious disorders happened by their own support.