The Physician as Medical Illustrator

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Week 5
A good picture is worth a 1,000 bad ones
Narrative

- How to illustrate an operation
  - Choose the correct orientation
  - Be consistent – or clear
Narrative

- How to illustrate an operation
  - Choose the correct orientation
  - Choose the key moments
Narrative

• How to illustrate an operation
  – Can you reduce the number of figures?
How to illustrate an operation

- Can you reduce the number of figures?

Narrative

- Herniated fat
- Linea alba
- Fascial defect
Show incomplete maneuvers:

This shows the ‘before,’ ‘during’ and ‘after’

- Resect the duplication cyst, including the common serosa, exposing the muscularis of the stomach
Narrative

• Show incomplete maneuvers:
• This shows the ‘before,’ ‘during’ and ‘after’
  – After placing a first piece of tape on the right of the mouth, a second piece starts on the left cheek, comes across over above the upper lip and is secured circumferentially around the ET tube
Narrative

• Show incomplete maneuvers:
• This shows the ‘before,’ ‘during’ and ‘after’
  – The clamp is partially open, showing the suture being grasped
  – The scalpel is partially through the vein
Narrative

• Show what was removed:
• This shows the ‘before,’ ‘during’ and ‘after’
  – The proximal vena cava is tapered by excising a corner, and suturing it close
  – The distal vessel is “fish-mouthed”
  – The diameters now match,
  – and can be anastomosed
Figure and Organ Drawing

- Use symbols and other tricks
  - Arrows
  - Icons (scissors, blade)
  - Insets
  - Labels
Narrative

• Number the steps
Narrative

• Number the steps
Narrative

• Successive steps explained in a single image

1. Pinch the tube upstream (top right)
2. Squeeze the fluid downstream (arrow, bottom)
Narrative

- Successive steps explained in a single image
  1. Palpate the symphysis pubis
  2. Angle the syringe slightly toward the pubis
  3. Insert the needle into the bladder
Successive steps explained in a single image

1. Stabilize the pylorus with the left index finger in the duodenal end and the left thumb in the gastric end
2. Spread the muscularis to expose the mucosa
Successive steps explained in a single image

1. Grasp the incarcerated bowel loops with the index finger and thumb of the left hand
2. Push the hernia further down first,
3. Then push it back into the canal
• Successive steps explained in a single image
1. Insert the needle into the artery
2. Once there is blood return,
3. Advance the guidewire into the vessel
Narrative

• Successive steps explained in a single image
1. Cut the right ureter above the obstruction
2. Make a longitudinal incision in contralateral ureter
3. Swing the proximal right ureter across the midline
4. Anastomose in a end-to-side fashion
• How did *they* do?
Narrative

• Fetal tracheal occlusion to treat lung hypoplasia
  – Congenital diaphragmatic hernia: liver, intestines in the thoracic cavity, through a hole in the diaphragm
  – Abdominal viscera compress the lung
  – The lung fails to develop properly
  – Occluding the trachea in utero traps lung fluid
  – Increased lung fluid causes some alveolar stretch
  – Stretch causes accelerated lung growth
  – Lung hypoplasia is reversed by term
Narrative

- Fetal tracheal occlusion to treat lung hypoplasia
Narrative

• Fetal tracheal occlusion to treat lung hypoplasia
  – Image reads top-to-bottom
  – Arrow helps explain the dynamic
  – Diaphragmatic hole suggested by a few bowel loops
  – Text reads top-to-bottom as well
Narrative

• Fetal tracheal occlusion to treat lung hypoplasia
Fetal tracheal occlusion to treat lung hypoplasia

- Top image shows how it’s done
- Key elements: scope, ultrasound, head and neck
- Insets show balloon inflated, then detached
- Orientation is the same – insets are close-ups
• Fetal tracheal occlusion to treat lung hypoplasia
Narrative

- Fetal tracheal occlusion to treat lung hypoplasia
  - Top image shows how it’s done
  - Bottom images are close-ups, but...
  - ... different orientation
  - ... unclear which body part
  - Left inset redundant?
Narrative

• Fetal tracheal occlusion to treat lung hypoplasia
Narrative

• Fetal tracheal occlusion to treat lung hypoplasia
  – 4 images seem essentially the same
  – Shows progression (scope in, balloon inflated, balloon detached, balloon retrieved)
  – Close-up is on head, not on trachea
Narrative

• Gastroesophageal reflux:
  – The abdominal portion of the esophagus is too short, or non-existent
  – The esophageal hiatus is too wide (hiatal hernia)
  – Increased gastric pressure causes vomiting

• Fundoplication:
  – Narrow the hiatus
  – Wrap gastric fundus around the esophagus
  – Adds “turtle neck” to the lower esophageal sphincter
Narrative

- Fundoplication for gastroesophageal reflux
  - 11 images – too much details, too confusing
Narrative

• Fundoplication for gastroesophageal reflux
  – 3 images – too similar?
Fundoplication for gastroesophageal reflux

- 3 images – the essence of the operation
  1. Free the esophagus and place sutures in the diaphragm
  2. Pass the fundus behind the esophagus, place sutures
  3. Complete the wrap
Narrative

• Fundoplication for gastroesophageal reflux
  – Only 2 images – clear, but less detailed
Narrative

- Fundoplication for gastroesophageal reflux
  - One image – doesn’t show the approach
  - Clear idea of what the operation achieves
• Intestinal malrotation and volvulus
  – The posterior attachment of the mesentery normally runs in a line from the duodenum to the cecum: midline upper abdomen to right lower quadrant
  – In malrotation, the duodenum doesn’t describe a C-loop, but runs straight down; all the small bowel is to the right of midline, the colon to the left
  – Duodenum and cecum are next too each other: the posterior attachment of the mesentery is now a single point, rather than a line
  – This makes it more prone to twisting: volvulus
• Intestinal malrotation and volvulus
  – Normal rotation (left)
  – Malrotation and volvulus (right)
Narrative

- Intestinal malrotation and volvulus
Intestinal malrotation and volvulus
Narrative

- Intestinal malrotation and volvulus
Narrative

- Intestinal malrotation and volvulus
Narrative

- Intestinal malrotation and volvulus
Assignment # 5

• Illustrate one of these three operations
  – Using only 3-4 figures
    – Laparoscopic appendectomy
    – Laparoscopic cholecystectomy
    – Laparoscopic right adrenalectomy