



Introduction:

Welcome to CUGH's bi-weekly clinical case-series, "Reasoning without Resources," by Prof. Gerald Paccione of the Albert Einstein College of Medicine. These teaching cases are based on Prof. Paccione's decades of teaching experience on the medical wards of Kisoro District Hospital in Uganda. They are designed for those practicing in low resource settings, Medicine and Family Medicine residents, and senior medical students interested in clinical global health. Each case is presented in two parts. First comes a case vignette (presenting symptoms, history, basic lab and physical exam findings) along with 6-10 discussion questions that direct clinical reasoning and/or highlight diagnostic issues. Two weeks later CUGH will post detailed instructors notes for the case along with a new case vignette. For a more detailed overview to this case-series and the teaching philosophy behind it, see [Introduction to "Reasoning without Resources"](#). Comments or question may be sent to Prof. Paccione at: gpaccion@montefiore.org

Note: If you would like to be notified when a new case is posted (along with instructor notes for the previous one), send your e-mail to Katherine Unger at kunger@CUGH.org.

About the Author:

Dr. Gerald Paccione is a Professor of Clinical Medicine at the Albert Einstein College of Medicine in the Bronx, New York. His career has centered on medical education for the past 35 years – as a residency Program Director in Primary Care and Social Internal Medicine at Montefiore Hospital, and director of the Global Health Education Alliance at the school. He has served on the Boards of Directors of Doctors for Global Health, Doctors of the World USA, and the Global Health Education Consortium. Dr. Paccione spends about 3 months a year in Uganda working on the Medicine wards of Kisoro District Hospital where he draws examples for the case studies.

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CASE 45 – Of Course... But Really...

A. An 80 year old man is brought to the hospital for care of an extensive burn on his lower leg. His family says he was in his usual state of health, moving slowly around the house compound due to knee arthritis and “old age” with some degree of forgetfulness over the years.

He awoke in the morning with a large burn on his anterior lower leg over his distal shin. They said he must have fallen into the fire the night before. The patient concurred – he got the burn because he fell into the fire the prior night, but he himself didn’t remember that. (His family looked around quietly shaking their heads and rolling their eyes, and said he was forgetting things.) He had not lost weight nor had fevers, and wasn’t complaining of pain.

Physical exam demonstrated an afebrile patient in no distress; an ulcer bed of red-yellow oozing irregular granulation tissue covered about 15 square inches over his lower left shin and extended to the dorsum of his foot, exposing the lateral extensor tendon; the ulcer was surrounded by somewhat indurated soft tissue, and had raised clean edges with areas of overlying devitalized skin.

He was diagnosed with a Third Degree burn by the clinical officer and by the resident, and started on diclofenac, antibiotics and xeroform burn dressings (brought from the U.S.).

1. What is the “frame” of this case (i.e. the key clinical features the final diagnosis must be consistent with)?

- *By history from patient and family, patient fell into kitchen fire the prior night*
- *Large ulcer with exposed granulation tissue is in the area of the burn*
- *Patient can’t recall the event because of senility.*

2. What additional information from history and/or exam would be relevant in this case?

- *Were there any witnesses to the patient falling into the fire? Who first said the patient fell into the fire and how did he/she know?*
- *How did the patient get out? Did he call anyone?*
- *Was anything else burned? Were his clothes burned too?*
- *Were any changes noticed on his lower leg before the previous night?*
- *What is the patient’s mental status? Can he remember events, tell a coherent story?*
- *Does the exam reveal any other stages of burned flesh?*
- *Is there sensation over the wound? Is the wound or the surrounding area painful to touch or pressure, or painless and anesthetic?*

3. What is the implicit purpose of acquiring the additional information requested and why is it important?

The history in this case provides not only clinical data from which to infer the diagnosis, but actually the diagnosis itself: a “burn”. The additional information cross-checks the reliability and accuracy of the data, which if accurate would indeed secure the presumptive diagnosis of “burn”. It’s particularly relevant in this case because the story strains the imagination and lacks face validity: a large acute burn that went unnoticed by even the patient?

B. A young man was brought in comatose with a large laceration on his scalp, accompanied by a group of friends and his cousin. He is put in a side room temporarily and the medical staff summoned. When you see the patient about 5 minutes after arrival, he’s far from comatose – rather agitated, lashing out, violent - taking 5 of his friends to restrain him.

While grappling to hold him down, his friends provide the following history: he owns a banana-beer brewery, was drunk and carrying money, someone tried to rob him by hitting him on the head with a rock, he then became crazy and violent and was taken to the police station where he was restrained. He continued to act aggressively drunk, and, having been clobbered on the head in the street, lapsed into unresponsiveness. The police called a taxi, and he was taken to the hospital.

In the hospital, he was initially unresponsive, but then suddenly awoke and became violent again.

Exam was notable for a muscular 24 year old fighting and struggling against his friends, each clamped down on a limb while another tried to hold his head still. Yelling, spitting, straining. Blood oozing from a 2 inch deep laceration on the back of his head. Pupils equal and reactive to light; (gross) neurologic exam revealed a very strong man without focal signs.

Diagnosis by clinical officer and resident: severe agitation due to drunkenness and head trauma; sedation was ordered.

4. What “frame” (i.e. key clinical findings the final diagnosis must be consistent with) was the resident and clinical officer working from when they made their diagnosis?

- *brewery owner*
 - *drunk and rich,*
 - *head trauma from a robbery attempt,*
 - *concussion... leading to change in mental status ...*
- (N.B. it “makes sense” at a gut level)*

5. “What’s wrong with this picture?”

- *How could trauma so profoundly alter mental status without causing any gross focal neurologic signs?*
- *Rapid alternation between violent behavior and unconsciousness.... How would alcohol or trauma cause that?*
- *If you stop and think about it, the story itself is quite unusual:*
 - *a robbery attempted with a rock...(really?);*
 - *organized, violent behavior due to trauma – (how?);*
 - *incarceration of the victim rather than the perpetrator?*
 - *delayed coma... (although possible with an epidural hematoma, it’s rare.. and then followed by full awakening?)*
- *Robber, police station, friends, cousin, taxi driver What a scene!*
- *The scalp laceration noted after police detention for violent behavior invokes a causal hypothesis that competes with the “rock-in-the-street”, and unfortunately is probably more common... police justice (or police brutality).*
- *Should sedation have been given? Was that decision also “wrong with this picture”?*
Although clinicians should think twice before ordering sedation in a patient with a change in mental status, especially when clinical monitoring is key to diagnosis (i.e. when labs or CT scans aren’t available), sedation is often essential - as in this case. Nothing could be accomplished (e.g. even taking the patient’s temperature) without sedating him. Furthermore, without neurosurgery as a therapeutic option it’s highly unlikely that “monitoring” without sedation could facilitate a cure. Sedation should be withheld if the patient’s alteration is hypoxia-induced – a condition that could be exacerbated by numbing the respiratory drive, but otherwise it’s often necessary with violent patients.

6. What are the next most important steps in the diagnostic process?

- *Confront the incongruities! Clarify the history by first doubting it, and then double-checking its reliability.*
Ask:
 - *How do you know this happened? Did anyone witness it? Was anyone with the patient at any point? Was he alone when “getting robbed” and clobbered? Who gave the history and how does he/she know?*
 - *Has the patient ever had similar experiences before... i.e. acting violently, problems with the police?*
 - *Does the patient get drunk? If so, how frequently? If so, does he ever act like this when drunk?*
 - *Especially if this is not a common occurrence for the patient (but even if it is), explore other explanations for an acute change in mental status in a young man in Uganda.*
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7. What is *common* to the above patient vignettes?

- *both patients are brought to the hospital by family and/or friends - who provide the history*
- *both histories provide CAUSAL explanations which seem to make “common sense” at one level, but after careful reflection from a biomedical perspective, gaping holes become apparent....*

Revisiting Case A: Answers to the additional questions:

- There were no witnesses to the fall into the kitchen fire and family members didn't know how he got out. He didn't call anyone, just went to bed.
- Nothing else was burned, clothes were okay.
- The patient's mental status seemed reasonable, though he was illiterate. He was alert and oriented to person, place and month/year, knew the names of the president of Uganda, the Chief of his village, his family. He could relate aspects of his life, like occupation, places lived, military service, etc., but not their dates.
- There were no other stages of burn on his leg.
- The wound had normal sensation, but was not tender.
- The patient said it was his 13 year-old nephew who first said it was “a burn” - not because he saw the man get burned, but because when he saw it for the first time in the morning, it looked like “a burn”. His family agreed. He “must have” fallen into the fire, and they told the doctor so.
- In the weeks leading up to the burn, the patient noticed the skin over his lower leg was swollen, and had become puffy.

8. With the additional information above, how would you re-formulate the frame of Case A?

- *large painless ulcer on lower leg with base of granulation tissue, indurated surrounding tissue and overhanging edges;*
- *area of ulcer preceded by painless swelling for at least weeks, afebrile*
- *patient can recall life events and is reasonably oriented;*
- *family did not witness a fall into a fire and patient was unaware of having done so, but the area looks to them like a “burn”.*

9. What's your diagnosis in Case A?

- *An undermining Buruli Ulcer (due to mycobacterium ulcerans) on the leg. It had been a painless subtle swelling over his shin until the overlying devitalized skin suddenly sloughed off the night prior to presentation exposing a red-yellow oozing bed of irregular granulation tissue about 15 square inches in area – that looked like a “burn”.*

Revisiting Case B: Answers to the additional questions ... and more:

- *no one* who brought the patient to the hospital had witnessed anything first hand – they had heard the “drunk bashed with a rock” story from the taxi driver who brought them all to the hospital with the patient. The taxi driver hadn't been with the patient either, but figured that that must've been what happened with this kind of thing i.e. rich guys who own breweries... or else he had heard it from the police. No one really knew if the patient had indeed been robbed at all... but one thing was certain: he had been acting strangely in the street and somehow wound up in the police station.
- His cousin, helping to hold him down, said, yes he drinks, but he's *never* seen him like this.
- Once sedated, his temperature was taken: 100.8 axillary.

10. With the additional information above, how would you re-formulate the “frame” in Case B?

- young man acting strangely in the street, taken to the police station and then the hospital
- scalp laceration noted on admission to hospital after street and police station
- alternating unconsciousness and hyper-vigilant, agitated, bizarre purposeless behavior
- febrile

11. What’s the probable diagnosis in Case B, and what test would confirm it in the Kisoro setting?

A febrile young man with a change in mental status is likely to have malaria, even in low prevalence areas like Kisoro. In this patient the “paracheck” (a rapid diagnostic test for malaria requested by the attending) was indeed positive.

Diagnosis: Cerebral malaria causing change in mental status either directly, or through non-convulsive status epilepticus (NCSE, “temporal lobe epilepsy”; NCSE would explain the sudden alterations of consciousness). The agitated bizarre behavior in the street invites trauma and the police station (in either order), a call to devoted friends, and lots of assured, sensible (but wrong) reasons why it happened.

The patient fully recovered, and was very apologetic, within 24 hours of IV quinine.

12. What “universal truth” about human behavior was overlooked by the clinicians caring for both of these patients, leading to the initial diagnostic error?

How can these common errors in clinical practice be avoided?

- *“To explain is human”: all patients and their families have causal hypotheses ... and doctors go to medical school to assess whether these causal hypotheses are likely to be true from a biopsychosocial perspective.*

- *When diagnosing, whether in the U.S. or Kisoro, physicians must think independently of the patient’s causal reasoning. Listen carefully, but treat causal statements with “a grain of salt” unless they meet your own medically-based assessment.*

This sounds obvious, but in practice it’s not. Patients’ causal reasoning - viewed through the prism of their prior life experiences - are not “outta space” (unless they invoke witches) and can seem quite logical on first blush. They always make some sense, but if you take a step back and think about them, the explanations can be extraordinary and improbable.

In Uganda, our lack of familiarity with both the culture and the spectrum of disease, compounded by the lack of diagnostic resources we’re used to in the U.S., further inhibit our objective, critical appraisal of the patient’s or family’s reasoning. On unfamiliar turf, we may be more afraid to challenge. In most situations however, the common ground of human experience should win out, and common-sense causal reasoning held accountable to biologic plausibility.