

Typhoid and Other Surgical Emergencies

Considering the Challenges to Surgical Practice in Northern Ghana

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Objectives and Disclosures

1. Discuss the challenges of surgical practice in a resource limited setting
2. Discuss the challenges of surgical management of typhoid fever and other interesting conditions in such settings
3. Consider challenges to providing surgical care in cross-cultural settings
4. Discuss the importance of capitalizing on available resources in any setting

I have nothing to disclose

As I talk this morning about my experiences over the past 5 years in Ghana, I would like to discuss some of the challenges that I found are inherent in practicing surgery and managing various diseases in a resource limited setting - especially when the culture and language are different from my own. Finally, I realized that for me to be successful, I would need to capitalize on the resources which are available to me.



Let me share how I went from being a resident here at the Medical Center to working at a mission hospital in Northeast Ghana.

During my 4th year of medical School, I did a 3 month international rotation at the Baptist Medical Center in Nalerigu, Ghana. My time in Ghana confirmed for me that this was the path God had called me to follow. I volunteered again for a month in 2013 right at the end of residency. Finally, after I finished my fellowship in Cordele, my family returned for our first term as missionaries with the International Mission Board, starting in October 2014.

My History at BMC

2007

2013

2014 - 2019



We spent our first 6 months studying the language and culture in order to be more effective in building relationships and communicating both inside and outside of the hospital.

In that first year, I also took the licensing exam to become a Surgical Specialist in Ghana.

We are currently in the States for a sabbatical year. Next June, we plan to return for our second term.

Baptist Medical Center

Nalerigu, Ghana
West Africa



-The Baptist Medical Center was founded in 1958 by the International Mission Board of the Southern Baptist Convention.

-After the missionary doctors did mobile clinics in the region for a few years, ...

Baptist Medical Center

Nalerigu, Ghana
West Africa



Naa Sheriga
Overlord of Mamprugu 1947-1966

-...the land for the hospital was given to the founders by Naa Sheriga the king of the Mamprusi people — the dominant tribe of the region... because the king knew that the hospital would be greatly beneficial to his kingdom and Northern Ghana as a whole.

-In the beginning,...

Baptist Medical Center

*Nalerigu, Ghana
West Africa*



- In the beginning, the hospital was completely run by Americans - doctors, nurses, pharmacy, maintenance...
- Over the years, the hospital has slowly been transitioning to Ghanaian administration, nurses, doctors, and ancillary staff.
- In 2014...

Baptist Medical Center

*180+ Beds
10K In-Patients Annually
60K+ Clinic Patients Annually*



- In 2014 – the hospital was finally handed over to the leadership of the Ghana Baptist Convention, ****
- BMC has grown to have over 180 beds, serving over 10,000 inpatients and 60,000 clinic patients annually.
- Down in the Theatre ...

Baptist Medical Center

*Operating Theatre
~1200 major operations
3000+ small procedures*



- Down in the Theatre (as we still call the operating room from the days that Ghana was a British colony) we perform approximately 1200 major operations which includes C-Sections as well as over 3000 smaller procedures every year.

Baptist Medical Center

Nalerigu, Ghana
West Africa



Dr. Isabella Amese

- Currently, BMC is staffed by Ghanaian practitioners and I was the only general surgeon. However, a young Surgeon from Ukraine is now working in my stead, while I am here in the US.
- Because of the heavy work load, we greatly appreciate the help we get from Short term Volunteers. Doctors, residents and students come from the US, Canada and Europe to help us out.
- Even our own

Baptist Medical Center

Dr. Vince Culpepper
January 2017



- Even our own Dr. Vince Culpepper came out to BMC in 2017.
- At times, specialized teams come out to focus on particular needs, like plastic surgery and I learn new skills in the process.
- I teach visiting medical students and residents as well as young Ghanaian doctors who do rotations at BMC.
- All of the Ghanaian doctors are required to practice obstetrics and perform cesarean sections. So, I have not added obstetrics to my repertoire.



Challenges in a Resource-Limited Setting

Lack of Human Resources

Limited Laboratory and Imaging Services

Language and Culture Barriers

Patients' Financial Hardships

While working in Northern Ghana, I have found that there are many challenges that must be overcome when resources are limited.

- The first notable challenge is the lack of human resources - Our hospital does not have an adequate number of physicians because it is difficult to convince doctors to work in such a rural location.
- The number of nurses on duty does not always match the demand of our patient census and even in the OR, we are limited by the number of staff on duty.
- At any given time, only one anesthetist is on duty. Therefore, if any obstetric emergencies arise, they usually trump the general surgery cases.
- We have very few laboratory services available on a consistent basis. This limits our ability to closely monitor electrolytes or liver and renal function in our critically ill patients.
- Language and cultural barriers are more complex than just needing a translator (This is why I learned the

language and continue to be a student of the local culture)

- Finally, patients in this region are mostly subsistence farmers who have very limited financial resources to spend on healthcare.
- All Ghanaians are eligible to buy-in to a National Health Insurance Scheme, but it isn't comprehensive, especially for advanced care

— But, instead of just listing the difficulties, I would like to discuss various cases that I have managed over the past 5 years as I navigated these challenges and found ways to care for my patients despite the limitations. I had to start by identifying the resources that WERE available to me and be thankful for the help they gave me.

I am grateful for my colleagues at BMC. We consult each other on a daily basis.
But...I am also grateful for technology that has allowed me to stay connected to colleagues and attendings abroad... to ask for ideas, recommendations or even if just for confirmation that my management plan was reasonable. Many of you in this room have been that help to me.

A subscription to UpToDate was an incredible point-of-care resource that I carried in my pocket.
I had my library of reference textbooks and atlases to build my knowledge, but many times, the proposed treatment included many things that were not available in my setting.

This is why Primary Surgery - a book that is actually geared towards the nonsurgeon, was a good resource for management of surgical problems that was more consistent with what was available to me.

The picture to the right of the screen is an excerpt from PRIMARY SURGERY.

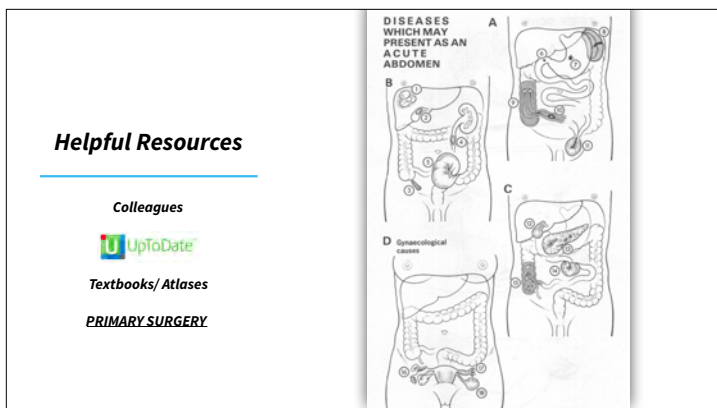
Of the 18 disease processes noted in the diagram, Liver abscess, biliary duct stones, sigmoid volvulus and ovarian cysts, just to name a few — I've managed 16 — using the resources available to me

Besides abdominal emergencies, I have managed everything from, chronic wounds and necrotizing fasciitis, hernias of all sizes, breast tumors, bone tumors, traumas and much more than I could discuss in an hour presentation.

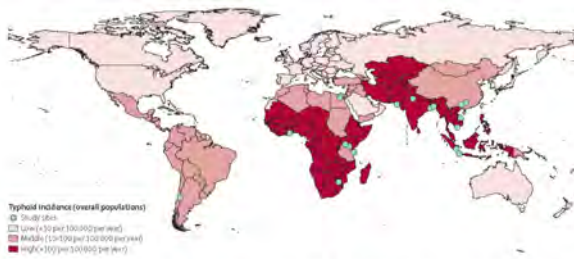
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I would like to first talk about one of the most common causes of an ACUTE ABDOMEN where I work...Typhoid Fever

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Typhoid Fever



Typhoid Surveillance in Africa Programme (TSAP)
Marks F, et al. Lancet Global Health 2017; 5: e310-23

During medical school and residency, we all learned about “Typhoid Mary” who was an asymptomatic carrier of *Salmonella Typhi* and infected many people around the turn of the 20th century in New England. Thanks to sanitation and clean water, most of you in this auditorium today have never treated a patient with Typhoid Fever.

In low to middle income countries across Southern Asia and Sub-Saharan Africa, however, Typhoid Fever continues to ravage populations who don’t have regular access to sanitation or clean water sources. Up to 21 million new cases occur each year and claiming up to 200,000 lives. In Northern Ghana, the majority of my surgical emergencies are related to typhoid fever. In peak season, new cases arrive at the hospital on a daily basis. Children are most affected by the disease, likely because the older populations have already build up immunity.

Typhoid fever gives patients high fevers with a range of symptoms including Headache, Cough, Constipation/ Diarrhea, Abdominal Pain, and Malaise.

Often, antibiotics and supportive care will help the patient overcome the disease.

However, if a patient allows the disease to go untreated, complications like shock, encephalopathy, intestinal hemorrhage and intestinal perforation or even death may occur.

Typhoid Perforation

Multiplication in the Peyer's Patches lead to hemorrhage and ulceration



As the bacteria are ingested, they gravitate to the lymphoid tissue of the Peyer’s patches in the ileum. During an incubation period of about 1-2 weeks, they enter the bloodstream to create a systemic illness, but continue to replicate in the Peyer’s patches. Inflammatory responses against the bacteria lead to necrosis of local tissue causing ulceration and ultimately hemorrhage and perforation of the bowels.

The rate of perforation increases after about two weeks of untreated disease...even up to about a third of cases may result in perforation.

This is where typhoid fever enters the realm of surgery.



Case Study

History:
10 year old girl with
7 days of recurrent fever and headache
3-4 days of abdominal pain / constipation
Increasing abdominal distention
Decreased urine output

Exam:
Patient is lethargic, T 39C
Heart: HR 150s, no murmur
Lungs: tachypnea, clear
Abdomen: distended, guarding throughout
GU: minimal concentrated urine in catheter
Rectal: empty vault

Let us consider a typical presentation of a patient with typhoid fever with a perforation.

**A 10 year old girl is brought to the hospital from a village with a history of about 7 days of fever and 3-4 days of abdominal pain and constipation. She has a decreased appetite with poor nutrition over the past week. Her abdominal pain has been accompanied with increasing distention.

On exam, the patient is lethargic, febrile to 40C, she is tachycardic. She is also tachypneic - often exaggerated by the distention of the abdomen pushing on her diaphragm. Guarding and rebound are present throughout the entire abdomen. As the nurses place the urinary catheter, the urine is a very concentrated scant amount. On digital rectal exam, the vault is empty.

Typhoid Perforation

Resuscitation
Antibiotics
Nasogastric Decompression
Urinary Catheter Placement
Monitoring



So how do we manage Typhoid Fever with perforation?

Management of typhoid perforation begins with resuscitation of the patient based on their level of dehydration and shock, just like any other case of peritonitis.

Intravenous Broad Spectrum Antibiotics are started right away. (Usually, we use Ceftriaxone or Ciprofloxacin as the mainstays of treatment. When perforation is suspected, anaerobic coverage is added in the form of metronidazole.) A nasogastric tube is placed for decompression of the stomach and a urinary catheter is inserted for monitoring output and color, because a patient's urine output and vitals are our only true markers available to indicate how the patient is responding to resuscitation.

Our laboratory services can give information regarding concomitant malaria infection, hgb or hct levels - but renal function panels and electrolytes have been unavailable for years. Private labs have sprung up in town, but their results have proven to be unreliable and are expensive for the patient.

Therefore, before we take the patient to the OR, the patient must be able to make urine and demonstrate an ability to excrete the anesthetic medications used in the OR.

Role of Ultrasound in Typhoid Fever

Findings:
Intraperitoneal fluid

Presence of Fibrin or stranding

Thickened / edematous bowel walls



[African Journal of Emergency Medicine](#)
Volume 6, Issue 1, March 2016,
Pages 44-46

We have an ultrasound machine which has become my best clinical diagnostic tool.

Even when I have already convinced myself that a patient has a Typhoid Perforation, I use the Ultrasound to confirm my diagnosis.

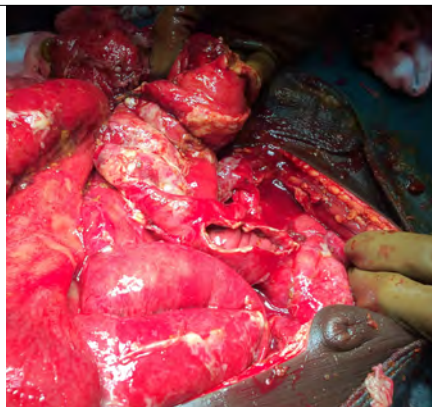
When I was a resident here, I always looked at my patient's ultrasound or CT scan images FIRST...then I would look at the official radiologist report. Only by doing this was I able to become adept at understanding the nuances of the images.

Sometimes, the patient's presentation is not quite typical. This is where an ultrasound can help guide my decision making process, but if I hadn't looked at all the others first, I wouldn't be able to decipher.

When a perforation is present, there is usually intraperitoneal fluid. Sometimes, only a small amount of thick fluid in the pelvis. Other times, the fluid extends to the areas usually checked on a FAST exam. The heterogenous appearance of the echogenic patterns helps to confirm intraperitoneal contamination.

Operative Management

Primary Repair
vs
Resection / Anastomosis
vs
Resection / Ostomy
Irrigation and Drainage



Once the diagnosis is made, I discuss the need for operation with the family and ask if I can pray for them. No matter whether they are Christian or Muslim or follow African Traditional Religion, everyone welcomes the prayer. We then prepare the patient for the operating room.

Usually, children are intubated with a general anesthetic. Often teens and adults are given spinal anesthesia, unless we suspect that the operation will take longer than 2 hours.

Through a midline incision, I begin my inspection of the abdominal cavity. Sometimes, there is minimal contamination from a single, recently perforated hole. It is on the antimesenteric bowel about 15cm from the ileocecal valve. In these cases, I debride the necrotic tissue surrounding the perforation until I see healthy bleeding edges with healthy mucosa. Then I repair the hole in transverse fashion using two layers.

* More often than not, I find multiple holes in the ileum or

areas of near-perforation where the ulceration hasn't completely eroded all layers of the bowel wall.
If the number of holes is limited to 4 or 5, and the patient is relatively stable, I will do primary repairs of each hole.

Operative Management

*Primary Repair
vs
Resection / Anastomosis
vs
Resection / Ostomy
Irrigation and Drainage*



However, many holes may be present.(The most I counted was 18!) Resection is the only choice at that point.

If I believe that the patient is strong enough , I will resect and do a hand-sewn, double-layer anastomosis.
If, however, the patient is extremely ill or much of the right colon is involved, I will give the patient an ostomy - This allows the patient to fight for her life and regain strength until I can reestablish bowel continuity.

We end the case with copious irrigation of warmed saline, being diligent to remove as much of the contaminated fluid and exudate as possible, and wash out all the nooks and crannies.

If drains are available, I often will leave a JP drain for a few days.

At times, I have skipped the drains in patients with minimal contamination and they have done well....but typhoid perforations are fraught with complications...

Typhoid Perforation - Complications

*Electrolyte Disturbances
Surgical Site Infections
Re-perforation
Intraabdominal Abscess / Fistula
Fascial Dehiscence
Death
Incisional Hernia*

Typhoid Perforations are associated with post-operative complications in about 40%-50% of cases. My patients are no different from the norm. I have spent much time dealing with the complications and working to find sustainable solutions which will improve patient outcomes.
These complications include electrolyte disturbances and edema, Surgical site infections and well as re-perforation and intra-abdominal abscesses or fistulas may occur.
Fascial dehiscence is very common but often related more to the patient's malnourished state than to infection. The mortality rates are as high as 23% in some areas of SubSaharan Africa. A late complication that often develops as a result of other complications in an incisional hernia.
On average, I have been able to repair these defects using component separation or primary repair - about 6-12 months later.

Building Rapport



Returning to my patient from before. The 10 year old girl was brought to the operating room and I primarily repaired multiple holes, irrigated and closed her. After the first operation, she developed edema throughout her entire body which also caused one of the perforations to re-open. I brought her back to the OR to re-close the hole.. She then developed intra-abdominal abscesses and fascial dehiscence. I drained the abscesses and repaired the fascial defect. Her post-operative course was very difficult, but with nutrition, antibiotics and supportive care, she finally got better. Through my daily interactions with her and her mother in their own language. I was able to develop a relationship with them.

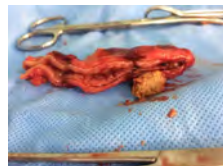
Thankfully, not all of my patients have this kind of struggle, but Its during the day to day postoperative course that I have opportunities to encourage my patients, to build rapport, and to share with them my faith in Jesus....

The girl's name is Mankulobi..which translated means, "I won't throw away." It was a name given to her after her mother had suffered multiple miscarriages before Mankulobi was born.

I was reminded of Dr. Feliciano's commencement address years ago in which he encouraged us NEVER to abandon our patients — never to "throw them aside". She is a young teen now, going to school and growing. Every couple months, I get a phone call from her and her mother, just to say hello!

Appendicitis

Use of Ultrasound as a point-of-care diagnostic and therapeutic tool



For me to transition from the more exotic tropical disease of typhoid fever back to run of the mill appendicitis may seem like a let-down, but nothing in Nalerigu seems like it's ordinary. Over the past 5 years, I have found that the ultrasound is ALSO a great tool for both diagnosis and therapy in appendicitis.

In 2017, I had a run of 5 patients with appendicitis in 5 consecutive days, each needing some form of surgical intervention.

but....

Early Missed Opportunity



In 2014. Another doctor had taken a 10 yr old boy to the OR for an appendectomy. She could not find the appendix and therefore closed him and gave him antibiotics. He improved for a couple days, but then started spiking fevers. It was at this time that the doctor called me. I was still in the middle of language learning and not yet working in the hospital.

I examined the child. He was tender along the right side of his abdomen.

I looked with ultrasound but I didn't understand the images. I didn't have much experience at that time.

We took him back to the OR. We found a retro-cecal, retro-peritoneal appendix...with a huge abscess. As I traced the appendix up, I saw a bigger problem. The inflammation had worn a hole in the duodenum.

I left drains next to the duodenum, did an omental patch and an appendectomy and closed him up.

2 days later, when I saw bile coming out of his drains, I decided to divert him.

I took him back for a 3rd operation and placed a Stamm gastrostomy and a jejunal feeding tube and I left the drains in place.

We fed him via the j-tube for 2 months. He didn't have to remain in the hospital that entire time, because he had family who lived in town and was able to give him the tube feeds. Eventually, the hole in the duodenum closed up and we removed all his tubes.



The first photo is from about a month after his tubes were removed in 2015. The second photo is from this past Christmas. He is in high school and doing very well!

I know that I have made myself very vulnerable to share some of my failures and struggles, but I have learned through this process...because

...I can't help but think what hardship I could have saved him IF I had appreciated the abscess on the ULTRASOUND and if it could have been drained percutaneously...

Since that early missed diagnosis,...

Ultrasound

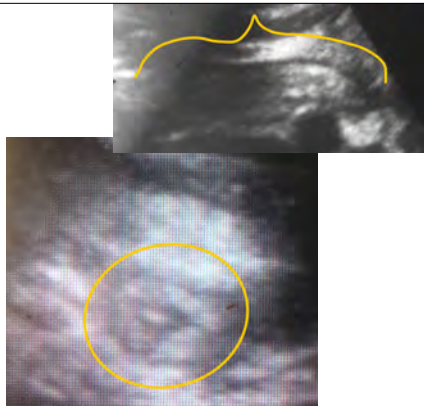
Practice Makes Perfect



Since that early missed diagnosis, I have been studying the ultrasound to improve my competency.

Appendicitis Week at BMC

1. 45 M - classic early appendicitis
2. 28 M - appendiceal abscess
3. 26 F - appendiceal abscess
4. 35 M - classic early appendicitis
5. 40 M - ruptured appendicitis with diffuse purulent ascites



These 5 cases in 5 days gave me a condensed course on using ultrasound as a point-of-care tool for both diagnostic and therapeutic purposes in the management of appendicitis.

What do I look for?

I have learned to look for a “small target sign” or evidence of edema around a non-compressible tubular structure. Greater than 6mm is considered to be enlarged, but usually, the appendix is at least 1cm when inflamed. I look for echogenic structures that shadow, representing appendicoliths. I look for fluid collections representing perforation or abscess formation. I keep doing ultrasounds again and again, picking up the nuances that will help me become a better diagnostician.

1. My first patient of the week was a 45 yo male, an employee of the hospital, with RLQ abdominal pain, nausea and vomiting, diarrhea at onset of symptoms. His Pain began periumbilically and relocated in the RLQ. Exam revealed a slight fever, focalized peritonitis in RLQ only. Ultrasound showed an inflamed appendix. This was classic appendicitis, but I used the ultrasound to confirm my ability to find the appendix when it was so clinically evident. —> I performed an open appendectomy through a right-lower-quadrant, muscle spreading incision.

3. (my 4th patient of the week was managed in a similar fashion to the first and they both healed very well.

Appendiceal Abscess

Percutaneous Drainage

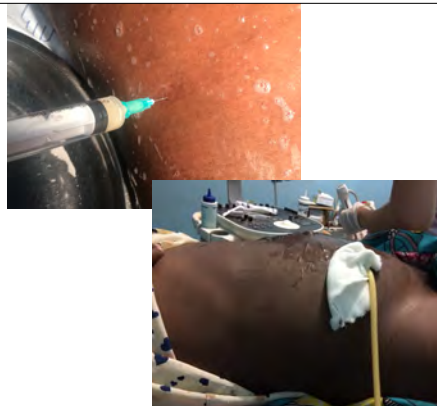


The second patient of the week was a male in his late 20s with a week-long history of abdominal pain in the right lower quadrant but he now had a growing mass in the same location.

On Ultrasound, I found a large abscess that abutted the anterior abdominal wall. I gave him IVF and antibiotics and scheduled him for a percutaneous drain.

Appendiceal Abscess

Percutaneous Drainage



—> The following day, I brought the patient to the procedure room and once again confirmed the abscess with ultrasound

I marked the best site for access to the abscess and injected lidocaine at that location.

Once we were completely ready, the patient is given a very low dose of ketamine,

Using sterile technique, I aspirate the abscess to confirm location. Leaving the needle in place, I make a small incision, spread it open with hemostats, pop through the fascia and into abscess, then thread in the foley much like placing a chest tube.

Most often, I just attach a foley bag for management of the drainage. We don't have fancy drainage kits or pigtail catheters, so we just use what is available

The 3rd patient had a similar story and I also drained her abscess percutaneously with ultrasound guidance

Ruptured Appendicitis

Abscess with Appendicolith



1. The 5th patient was the most interesting. He was a 40 yo male with 9 day history of abdominal pain and distention with fevers. He was treated at our hospital for "gastritis." Still in pain, he went to the teaching hospital more than 2 hours away. There, an ultrasound was performed and the diagnosis of "perforated appendicitis with purulent ascites" was determined; however, he was given oral antibiotics and sent home, because he looked "too well." Finally, at day 9, he came into my exam room. I did the ultrasound and came to the same conclusion before he even gave me the ultrasound report. We, however, decided that an exploration with appendectomy and drainage of the purulent ascites was the right treatment.

***** Interestingly, He is a butcher in our town's central market.

Once when I was shopping in the market, He offered me a huge bag of COW's FEET as a thank you gift for how I helped him. I declined the gift the first time, but once he

his generosity.*****

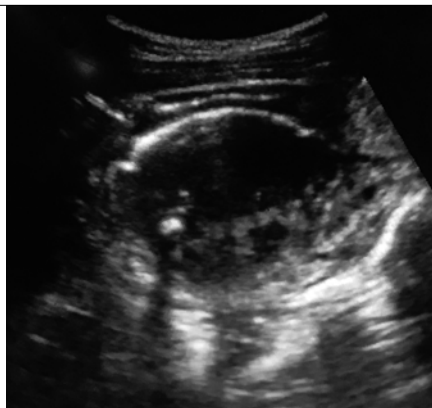
3.

Bonus Appendicitis Case

Abscess with Appendicolith

but...

*NOT appropriate for
percutaneous drainage*



In cases of Appendiceal abscess, I would much rather drain percutaneously if the abscess is amenable to such treatment. However, it isn't always feasible.

I have learned that small Appendiceal abscesses may be treated with antibiotics alone (especially if no appendicolith is present), but most of my cases have larger abscesses than that.

During this past year, a young man presented with over a week history of abdominal pain and fever with constipation and a growing abdominal mass in the right lower quadrant.

On examination, I thought for sure this would be another abscess that I could drain percutaneously.

As I inspected it on US, I realized that it did not FULLY reach the abdominal wall, but instead there appeared to be intervening tissue - whether omentum, bowel, mesentery - I couldn't be certain.

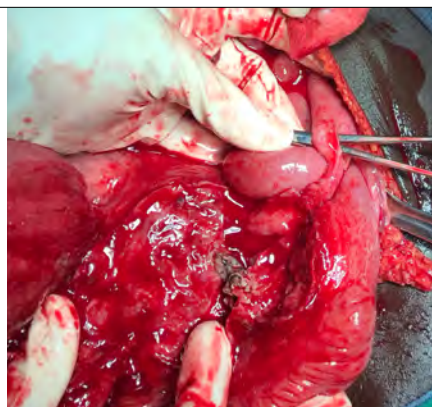
Instead...

Bonus Appendicitis Case

Abscess with Appendicolith

but...

*NOT appropriate for
percutaneous drainage*



Instead, I took him to the operating room and found that his terminal ileum had folded over on the ileocolic mesentery to surround the appendicular abscess. I was able to drain the abscess and remove the appendix with its appendicolith. The photo shows after I have already unroofed the abscess and ready to do the appendectomy.

Interval Appendectomy



Finally, I have managed many cases of Appendiceal phlegmon with antibiotics and non-surgical management because so many patients delay presentation to the hospital.

Only one patient, a young man from TOGO (our neighboring country to the East) has agreed to an interval appendectomy. This was his 4th episode of recurrent appendicitis, but he presented about 10 days into the current attack. We did the appendectomy without any difficulties, but his appendix had evidence of chronic inflammation.

We had a different language barrier this time as he spoke French. Thankfully, GOOGLE TRANSLATE helped us overcome that challenge.

Intestinal Obstruction

Common surgical emergencies due to not-so-common causes



In Nalerigu, I have dealt with intestinal obstruction from all the expected etiologies —> adhesions, hernias and tumors

But I have also opened abdomens for exploration to find completely unexpected etiologies for the obstructions

Intestinal Obstruction

Sisibi (Bush Grapes)



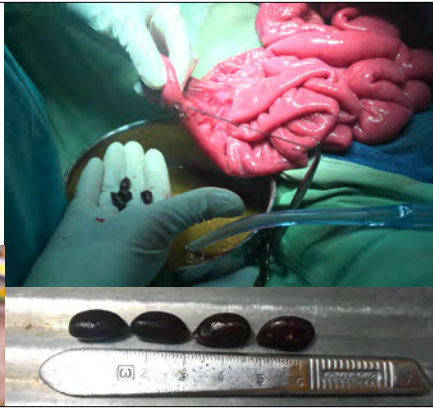
Some of the local fruits in our area seem to have little flesh in comparison to the size or number of its seeds. Oftentimes, people will just eat the fruit in its entirety... swallowing seeds and all. I suppose this habit is usually tolerated and the seeds are eventually discarded. However, From time to time, an anatomical variation will keep the seeds from passing forward and an obstruction is created.

5 year old boy presented with a bowel obstruction and an incarcerated umbilical hernia. The hernia felt lumpy, but it would not reduce. At laparotomy, we found that a floppy cecum was full of Sisibi seeds and incarcerated through the fascial defect! I made a small colotomy, removed all the seeds and repaired the hole. Then I repaired the hernia defect primarily.

An 8 year old boy...

Intestinal Obstruction

Gaya (Jackalberry)



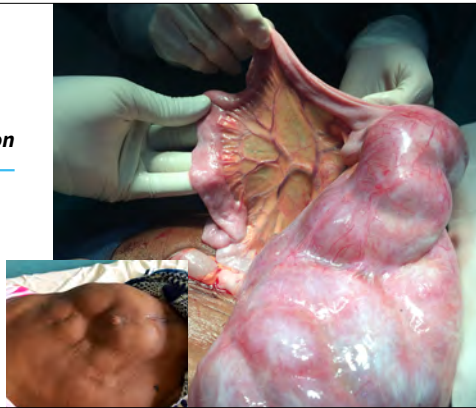
An 8 year old boy presented with a bowel obstruction that was not resolving with NGT decompression. At laparotomy, I found that the last 10 cm of terminal ileum were completely filled with approximately 50 seeds of the Gaya fruit. (Everyone in the OR could identify them right away). The child's ileocecal valve was not wide enough to let the seeds pass into the colon. Through an enterotomy, I also removed the seeds.

We affectionately named him the Jackalberry king.

Intestinal Obstruction

*Idiopathic sclerosing
encapsulating peritonitis*

(Abdominal Cocoon)



An elderly woman presented with a bowel obstruction. Instead of a diffuse distention of the abdomen, a large kidney bean shaped mass was palpated through the abdominal wall. Her son stated that similar previous episodes had revealed this "mass" but then resolved spontaneously, as did the mass.

Upon exploration, we found that her bowels were folded up like an accordion in a cocoon of adhesions that arose from over-zealous mesentery and enveloped the bowel. After careful lysis of the fibrous sheets of adhesions, it became clear that at the most distal fold of bowel, the seeds of the dawa dawa fruit were unable to make the turn and instead created the obstruction.

So what is this cocoon?

Upon investigation, these cocoons have been related to previous abdominal TB cases or other infections, Some are hypothesized to be the result of retrograde menstruation, while some are just deemed idiopathic. Here in the states, the most common etiology is secondary to peritoneal dialysis. I remember seeing it only once here in Macon - a case that Dr. Amy Christie managed with Dr. Ayoub.

Role of Ultrasound in Intestinal Obstruction

Diameter > 3 cm

Hyper-Peristalsis Proximally

Correlation with X-rays

Identification of other causes of obstruction



So, how does ultrasound help me manage intestinal obstruction?

As I place an NG tube for decompression, I also evaluate the bowels for signs that suggest a high-grade obstruction that will NOT resolve with non-operative management,

I look for...

Loops of small bowel distended beyond 3 cm, especially when transition points can be identified...a swirling or abrupt change in the diameter of a loop

Hyper peristaltic movement or a slushing back and forth of intestinal contents

Sometimes the juxtaposition of edematous bowels and dilated bowels can be a grave sign - representing strangulation

Often, I try to correlate my findings on x-Rays (if X-rays were available)

Ultrasound investigation can also give a more precise picture of the etiology of the obstruction

pyloric stenosis

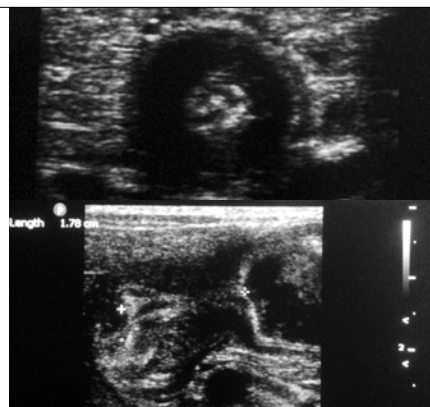
Intussusception

tumors

Intestinal Obstruction

Pyloric Stenosis

Pyloric Muscle Length → 15-19mm
Pyloric Muscle Thickness → 3-4 mm
Pyloric Diameter → 10-14mm



Pyloric stenosis can fairly easily be identified on ultrasound, which is helpful when the “olive” is not easily palpated.

Measurements within the parameters listed here are consistent with the diagnosis of pyloric stenosis.

The trickiest aspect

Intestinal Obstruction

Pyloric Stenosis



The trickiest aspect of operating on babies with pyloric stenosis is perioperative management - caring for a child who is usually much delayed in the proper diagnosis and presents with electrolyte imbalance and dehydration.

After adequate resuscitation, we take the child to the operating room

The open pyloromyotomy through a right upper quadrant incision is a straight forward operation. I know you can use a regular hemostat to spread the muscle edges, but I was so happy the day that I found a pyloric spreader among my tools.

In the postoperative course, I usually wait about 4-6 hours after the operation and then slowly allow the child to start breastfeeding again. The few that I have managed have recovered very well.

Intestinal Obstruction

Intussusception



When a patient with obstruction has been passing bloody mucus per the rectum, I suspect an intussusception.

Then I look on the ultrasound for a larger target sign than what is seen with appendicitis.

Once I see the target sign, I turn the ultrasound probe 90 degrees to view the intussusception longitudinally and can follow the bowel as it enters into itself.

Lymphadenopathy in small children is by far the most common cause of intussusception.

Intestinal Obstruction

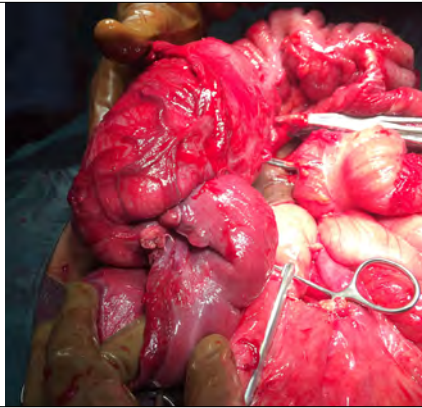
Intussusception



Especially in babies, I have seen the ileum progress all the way to the sigmoid colon and even prolapse out the rectum. It usually rips itself open as it strangulates itself.

Intestinal Obstruction

Intussusception



If it isn't from lymphadenopathy, tumors like lymphoma are often the lead points that cause the bowel to enter itself. We don't have the capability of using a controlled enema to reduce the intussusception, but with the track record of what I have seen, most of these patients will require a resection anyway. Therefore, I operate on every intussusception case that I see.

Intestinal Obstruction

Peutz Jegher Syndrome



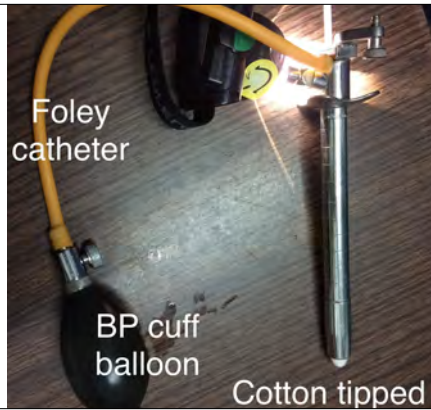
One of the most interesting cases of intussusception was a young man who had intermittent small bowel obstructions after a previous laparotomy in which he had a bowel resection. When I opened him up, I realized that he had multiple small tumors throughout his intestinal tract. The current intussusception was caused by a large pedunculated tumor. I was able to excise it through an enterotomy to preserve his bowel length. I did several other enterotomies to remove the largest tumors. As I was operating, I realized that I had noticed before surgery that he had dark macules on his palms and feet and lips! He has Peutz Jegher Syndrome...something I remember studying for ABSITE, but had never actually seen a case.

Here is where culture and limitation of resources comes into play. I instructed the family that they will need regular colonoscopies as the child gets older. It has been several years and to my knowledge, they haven't gone yet. I don't have capability of doing endoscopy at my facility right now....

Although, I have been able to do a few Proctoscopies...

Intestinal Obstruction

Do-It-Yourself Proctoscope

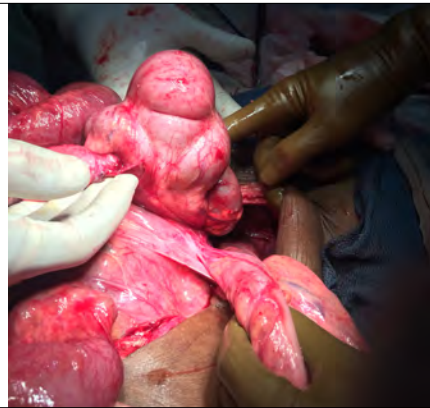
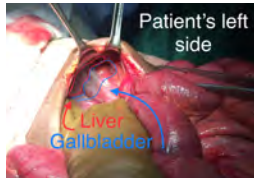


There was a day that I really needed to do a proctoscopy for a young girl.

I couldn't find a light source for my proctoscope. I couldn't find much of anything for it...so we improvised with a foley catheter, a BP cuff balloon, a cotton tipped applicator and a head lamp. The small girl had a small rectal polyp.

Intestinal Obstruction

Situs Inversus Totalis



Sometimes, surgery is indicated for a small bowel obstruction, but the findings inside are very surprising. I took a middle aged woman with signs and symptoms of intestinal obstruction to the operating room. A small band in the pelvis was the culprit. I excised the band and the obstruction was relieved. In due diligence, I wanted to run the entire length of the bowel to make sure that I had not missed something.

I first noticed that the cecum and appendix were unnaturally pulled over to the left lower quadrant, but I couldn't follow the bowels proximally. Instead, I started at the one constant I knew —> the rectum. To my surprise, the rectum followed up to the right lower quadrant as it transitioned to the sigmoid and descending colon. The transverse colon led proximally to the left side where the cecum gave rise to the ileum. It was situs inverses! The ligament of treitz gave rise to the jejunum, but as it swung out from the patient's right side! The Liver and Gallbladder were on the patient's left. Due to dense curtains of adhesions in the upper quadrants, I was not able to visualize the spleen.

I am not in the habit of performing incidental appendectomies, but in her case, I thought it may clear any confusion for future surgeons, so I removed her appendix.

Postoperatively, I used the ultrasound to confirm that indeed her heart was situated in her right hemithorax. Her spleen was on the right and her entire insides were a mirror image of what you and I are currently carrying around.

She was one in ten thousand with her Situs Inversus Totalis



This Guy is “Doorudoo” which is translated “Sick Man.” He is a character in a traditional performance who embodies all diseases and sicknesses that people fear.



Here he is terrorizing children.



Challenges of Surgical Care in a Cross-Cultural Setting

- *Influence of ATR*
- *Cultural Stigmas & Taboos*
- *Superstitions*
- *Language Barriers*
- *Shame Culture*
- *Lack of health education*

Culture and worldview have a huge impact on how a patients views health. In my setting, this is influenced by African Traditional Religion, cultural stigmas and shame culture alienate people from their communities, Language barriers and a lack of health education interfere with a patient’s ability to interact with the healthcare system.

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I have had many opportunities to listen to my patients, to advocate for them and to help them be restored to health and to their communities.

Intestinal Obstruction

African Traditional Religion

*Herbal remedies tied to
ancestral spirits*



- My youngest operative patient was a 3-week baby girl. Her family explained that after birth, the baby developed a terrible, infected skin rash across her buttocks and perineum.
- The young mother followed the advice of her elders to make sacrifices to the ancestors, asking them to bless these traditional herbs which she then fed to the baby as treatment for the infected rash. The rash seemed to improve, but the child's overall condition deteriorated.
- She presented with vomiting, massive abdominal distention and obstipation for several days. She was obstructed and needed an exploration.
- After resuscitation of this tiny baby, we took her to the operating room,
- We found that a thick sludge of herbs within the bowels had caused an intraluminal obstruction, stopped at the ileocecal valve.
- Not wanting to make a hole in the bowel, I was able to milk the substance into the colon and much of it was expelled per rectum onto the operating table.
- Thankfully, She recovered well without complications.

We took the time to explain to the mother the danger of some traditional practices, especially when dealing with illness in babies. The mother appeared to have learned many lessons from this experience and was grateful for our compassion.

Assault

African Traditional Religion

Black Magic



One of the most infuriating cases that I helped to manage was that of an 8 year old boy who had been assaulted one morning on his way to school. His assailant grabbed him and pulled down the boys pants. Using a knife, he cut off the boy's right testis and penis and then tried to also slit the boy's throat. The child escaped with his life, but will be forever scarred.

The perpetrator was apparently following the instructions of a traditional medicine man or soothsayer. He believed that if he obtained the severed genitals and followed the rest of the "instructions" he would gain wealth or power...or appease whatever spirit that was troubling him. African Traditional Religion is not a particular set of codes or beliefs. Instead, it is a worldview built on fear and the desire for power through the manipulation of the spirit world.

The child was transferred to urology specialists at the nearest teaching institution about 2 hours away. I heard that his hometown was collecting a love offering to give financial assistance to his family to afford reconstructive surgery, but he was otherwise lost to follow-up.

In this case, I had made very detailed notes and drawings (harkening

back to the days of drawing out diagrams on the trauma paperwork). Those notes were also submitted in police reports and came back around to me a year later. I was called to be an expert witness for the prosecution and therefore had my day in the Ghanaian court system. The accused was found guilty and sentenced to 15 years in prison.

Bladder Stone

Language Barriers



Listening to our patients sometimes takes more than just hearing the words, but understanding what may be the cause leading to the effect about which they are talking.

One toddler with rectal prolapse was brought to the hospital. This is usually a self-limited condition that improves with good nutrition.

I was able to reduce the prolapse and keep the prolapse reduced with buttock strapping.

The mother however kept talking about how the boy would always pull on his penis when he needed to urinate. It took her explaining it to me a couple times before I decided to Look at the bladder with the US. A large bladder stone was sitting right at the opening of the urethra which was causing a ball-valve effect until the tug on the penis opened the path for urination.

Through a suprapubic incision, I was able to do an extraperitoneal cystotomy to remove the stone.

With the stone gone, the child no longer had to strain to urinate so the added pressure on his rectum causing the prolapse resolved as well.

Rectal Prolapse

Perineal Rectosigmoidectomy



In adults, Rectal prolapse is a different story. Due to the shame of his condition, he delayed coming to the hospital until he could no longer stand it.

When he finally was admitted to the hospital, no amount of sugar or salt wraps would reduce this inflamed and edematous rectum.

Like I do with many cases, I pulled out Zollinger's surgical atlas and studied. I even had it opened in the operating room for reference.

Slowly but surely, I was able to excise the redundant rectosigmoid tissue and create a new anus with a coloanal anastomosis.

The patient found a new lease on life with his new anus.



Malignant Phyllodes



In cases of cancer, patients present to BMC in such an advanced state of disease that treatment options are often only palliative. When chemotherapy or radiation could still be considered, the patient and her family must find the financial means to afford such expensive treatment that is only offered at the large teaching institutions, hours and hours away from her social network. ****

Last year, a young woman in her 30s was brought to the hospital. She didn't speak the local language, but her family member did. She covered herself with a large cloth draped across her left chest. She held her breast in a sling. It was enormous. She said it had only been growing for approximately 5 months. Her husband had abandoned her and she had no money to pay for medical care.

I did a modified radical mastectomy and was able to close the wound primarily. The pathology revealed a malignant phyllodes tumor.

The patient healed very well. She was so happy to have such a huge burden removed. She never returned for follow up, but family members reported to me that she was doing well.

She was admitted a year later with a cough, hypoxia and difficulty breathing. Her entire left hemithorax was filled with fluid. We supported her, but within 2 days, she was dead. Our treatment was only palliative, but it gave her an extra year to live without such a huge burden to bear.

Trauma

Hand Injuries



In America, I don't usually expect to get trauma patients from funeral gatherings, but every dry season, when the Mamprusi give their final funeral celebrations for the deceased, they do it with a "bang"...a very LOUD bang!

Those bangs are usually secondary to homemade mortars and guns, packed with gun powder. When mortars and home-made guns are not handled properly, our patient population increases...and usually the hands are the victims****.

Trauma

Hand Injuries



- A 30 yr old man had been celebrating at a funeral all night long.
- In the morning, he was setting up the mortars. 4 went off well, but the last did not, until he picked it up with his right hand to check it.
- Upon examination in the theatre, his entire thumb was intact. The index finger still had skin but it was circumferentially detached from anything else.
- the lumbricles were absent but the tendons were present and working.
- The rest of the metacarpals and fingers were gone.
- The distal ulna and part of the radius were displaced medially. It was a mess.
- Several of the staff and students told me just to amputate the hand...But HIS THUMB WAS INTACT!



You can see his thumb is intact. His index finger is present, but looks more like an animatronic puppet.

Trauma

Hand Injuries



I was determined to follow the golden rule. If MY thumb was still intact, I would hope someone would do all they could to help me salvage the mangled mess.

Over the course of a couple weeks, we debrided his hand every other day.

We considered applying an abdominal wall pedicle flap to cover the exposed bones and tendons, but due to the risk of infection, we were discouraged from this route.

Instead, we did our best to close the wounds with available skin and splinted the hand and arm in a position of function.

The accident happened this past January. The photo on the right is from July.

He is still rebuilding his ability to use his hand and pincher grasp. My colleague sent me this photo and told me that she saw him lifting and carrying loads using both of his hands.

Amputations



In many cultures, patients are reluctant to agree to amputation.

Among the Mamprusi people, a man loses his eligibility to become a chief if he has had an amputation.

People fear that the disability of an amputation will take away their autonomy and make it difficult to farm, to work or do anything.

I have done amputations for gangrene, diabetic foot wounds, osteosarcomas in young men as well as other tumors in older patients. Often, trauma is the culprit - whether snake bite induced wounds, gunshots, or mismanaged fractures - but it still takes a lot of convincing to get consent for a much needed operation.

Amputations

... and getting people back on their feet again



One patient in particular was a young man who was shot in the leg by bandits while riding his motorcycle. The bullets shattered his tibia and fibula. Pulses in the foot were absent at first, but improved slightly after splinting the leg. We gave him the option of amputation or transfer to the teaching hospital for expert orthopedic care and possible external fixation. He, instead, chose to return to his hometown and trust the care of the local "bone-setter" against all of our advice.

3 weeks later, he returned. His toes were black and lifeless, but the muscles in his calf were still working. After much discussion, he finally agreed to a below knee amputation.

He healed very well and was extremely motivated to get a prosthetic leg. Thankfully, we have a program in Ghana which creates prosthetics and trains patients to use them. Once he returned home, he rode his bike 5 miles to the hospital to show me his new leg.



Final Notes

1. *Capitalize on the resources that are available to you.*
2. *Be open to learning new skills that will help you serve your patients better*
3. *Always be an advocate for your patients*

While the last 5 years have been exhausting in some respects, they have also brought me joy.

I have found success in using the resources available to me despite the challenges and limitations.

I believe that I have become a better surgeon by acknowledging my weaknesses and continually working to improve my skills.

In this broken world, we have disease and suffering and pain,

But as a surgeon, I can use my hands to bring healing to broken bodies,

I can show my patients love and compassion in the midst of suffering.

Just as God has shown me great love through Jesus.

I am thankful for the opportunity to serve where God has called me to serve.

I am grateful for many of you who have equipped me for this work.

And I hope that some of you will join me in Nalerigu one day, even if just for a short while.

Thank you

Typhoid and Other Surgical Emergencies

Considering the Challenges to Surgical Practice in Northern Ghana

Heidi Haun, MD, FACS

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