



# Surprising Differentials Uncovered

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A case for point-of-care ultrasound in tropical medicine, from Zambia.

A Case Study by:  
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“Bedside ultrasound has truly changed the way I practice global health.  
This story is but one of many.”

## Introduction

Sometimes, while scanning patients, you are truly surprised at what you find. This is all the more true when scanning patients in low-resource settings. Where I work in Zambia—a small government hospital in a poor part of Lusaka—patients often present with advanced pathology, and medical imaging is either too expensive, or simply unavailable to them. Point-of-care ultrasound (POCUS) has been an invaluable tool to help me better serve my patients and teach my resident physicians in this setting.

## Case history

Recently, we admitted a 35-year old male patient for abdominal pain. He was from a rural area of Zambia but was visiting relatives in Lusaka. Over the previous three days, he had experienced worsening abdominal pain, mild abdominal distension, nausea, and vomiting. Upon admission, the ER clinician started him on IV fluids and IV antibiotics. An initial abdominal X-ray read as negative for bowel obstruction.

When I rounded the next day with the Family Medicine team, we found this patient still in pain, but the pain had now localized to the right upper quadrant. We ordered an ultrasound of his liver and gallbladder, but were told he was too sick to go to ultrasound—and the machine at our hospital was not portable. “Let’s scan him ourselves,” I said in response. One of our 3<sup>rd</sup> year residents plugged the Butterfly iQ into my phone and began scanning his gallbladder.

The gallbladder was easy to find...but did not look normal. “What’s inside of it?” the resident asked me. I took a closer look. I didn’t see a gallstone, and while the gallbladder wall appeared thickened, it wasn’t quite the 3mm thickness that suggests cholecystitis. But unlike a normal gallbladder, there wasn’t much biliary fluid visible inside. “I think it’s completely full of gallbladder sludge,” I said. “Let me save the image and send it to a colleague in the U.S. to get a 2<sup>nd</sup> opinion.”

Later that day, I sent the images to the U.S. for an over-read. My colleague got back to me quickly via email. “Looks like a gallbladder with sludge. Usually you will see a sludge bile level which I don’t see here. Also, there are strange serpiginous hypoechoic areas. Could this be some kind of tropical parasite infection in the gallbladder? Does that fit with anything? I’m going out on a limb a bit here.”

So, I began to do some research. From my tropical medicine training, I remembered a parasitic worm that can sometimes migrate up the common bile duct and into the gallbladder itself, causing inflammation. After a few minutes of reading, I had found it. *Ascaris lumbricoides*, a soil-transmitted parasitic worm, known to do this very thing, which is termed “Ascariasis cholecystitis”. Multiple studies have demonstrated this phenomenon.<sup>1</sup> And it made sense for this patient—he was from a rural area, his symptoms were consistent with gallbladder inflammation, and his scan showed serpiginous tracks in the sludge, suggestive of a worm.

The next day on rounds, we asked the patient when he had last been dewormed. “It’s been years,” he replied. We ordered a stool sample to look for parasite eggs and de-wormed him with albendazole. After a couple more days of treatment, his condition had improved and he was discharged home, with follow-up appointments scheduled with our clinic and with general surgery, to schedule him for gallbladder removal. Despite these plans, he left for his rural village prior to follow-up, and any chance of reviewing his stool sample results disappeared with him...so we didn’t have definitive proof that *Ascaris* was the culprit. But without bedside ultrasound, we likely would’ve never even thought to consider it.

## Sample Imaging Exam



## What Does This Teach Us?

Point-of-Care ultrasound is a valuable asset for the clinician in any setting, but its value in low-resource settings—where patients often have no other imaging options—cannot be overstated. POCUS truly has the potential to transform healthcare delivery in resource-limited settings globally.

# References

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