

A METHOD OF TEACHING 20 WEEK OBSTETRIC ULTRASOUND TO A RURAL CLINIC IN GUATEMALA

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INTRODUCTION:

At 20 weeks, an obstetric ultrasound performed that looks at placenta location, fetal presentation, and presence of multiples, can save lives by alerting clinicians to the need for a possible C-section. Although an ultrasound is an indispensable tool in basic obstetric care, most clinics in rural communities around the world do not have one. There are two reasons for this. First, it is expensive. Second, there is a steep learning curve, making it difficult to use even if it is available. The good news is that prices have started coming down recently, making the devices more affordable. Many companies have started to develop less expensive, smaller units. Because of this trend, we anticipate that in the years to come, more ultrasounds will be available in these rural clinics.

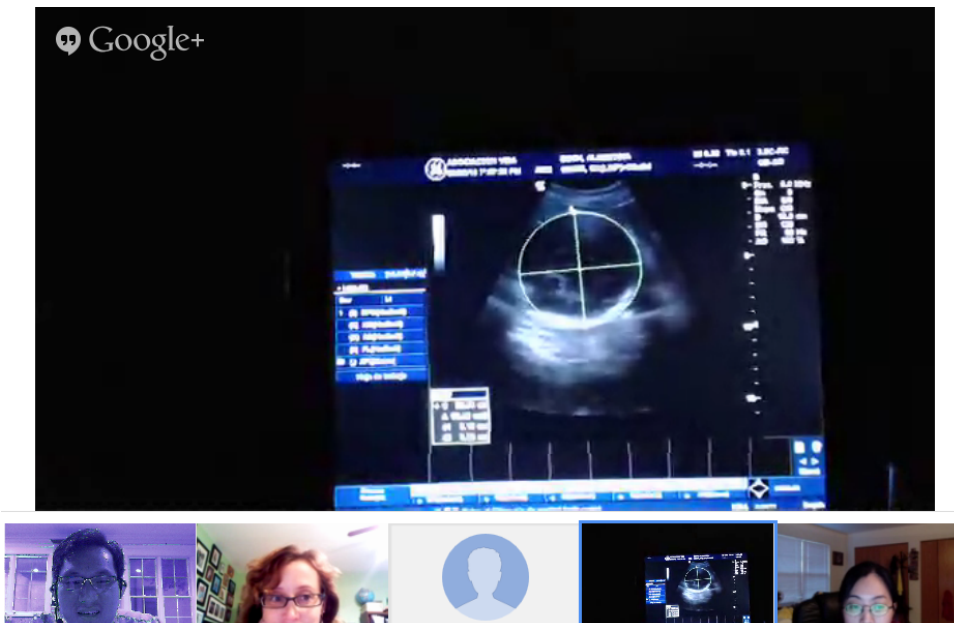
However, the second problem, steep learning curve, still poses a major challenge. Most serving trips to underdeveloped countries are short term, usually lasting one to two weeks. And this time is typically divided into multiple activities. During a short term medical trip, typically, about a half to one day is devoted to teaching ultrasound scanning. It is difficult to teach even basic scanning in such a short time. So the question we pose is whether we can develop an alternative method of teaching obstetric ultrasound scanning—one that allows clinic staff to practice and learn on their own without direct hands-on teaching. Can we then scale that solution such that others can replicate the efforts throughout the world?

One idea would be to develop a completely asynchronous method where we would send a package consisting of an ultrasound and teaching material. Clinic staff would then learn on their pace using the tools we have developed without the need for direct hands-on training. Obviously, this is not ideal because nothing can replace hands-on training by professionals. However given that there are so many rural clinic with need for obstetric ultrasound and lack of volunteers who can travel to remote locations to teach, this might be the next best alternative.

In this case study, we discuss the experience of physicians at Willow Creek Community Church in developing a method of teaching obstetric ultrasound remotely. By working with local doctors in rural Guatemala, we feel that we have developed some methods that might be scalable. By no means have we found the best solution and we are still in the process of learning. However, we feel that others who might be interested in such a project might find our experience beneficial.

BACKGROUND AND INITIAL METHODS:

In December of 2012, a group of physicians at the Willow Creek Community Church embarked on an innovative program to teach doctors in Guatemala ultrasound scanning by using a free teleconference program, Google Hangout.



[Screenshot of Google Hangout interface used for teleconferencing]

We did not know if this would work because of the technical challenges to such an endeavour. Not only was there a language barrier, there were lots of technical barriers--Internet connection problems as well as problems with webcams on both sides. We sent them an HD Webcam to use but there was still the issue of them having to hold the camera focused on the ultrasound monitor while we tell them where/how to move the probe. It was very difficult.

We supplemented these sessions by creating separate teaching videos on youtube that they could review outside of these sessions. Amazingly in only five teleconference sessions we were able to teach them not only basic orientation and placenta location, but also fetal gestational aging using the four standard measurements (femur length, abdominal circumference, head circumference and biparietal diameter) as well as AFI (amniotic fluid index) measurement.

Although we were very pleased with the success of the teleconferences, we knew that this was not a sustainable solution. It was taxing for volunteer physicians in the U.S. and was not scalable. Also much time was spent telling them where and how to move the probe. It was frustrating that we could not hold their hands and help them move the probe. We knew we needed another solution. However the teleconferences were very valuable because from these sessions we understood the specific challenges to learning ultrasound scanning and set forth to develop a better methodology.

NEWER METHODS:

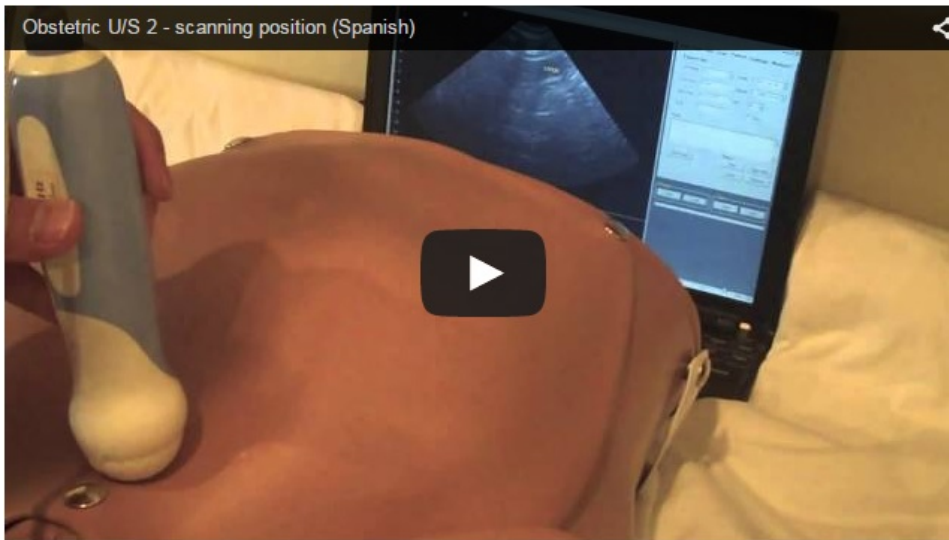
In September 2014, we donated a 3.5MHz Interson transabdominal ultrasound probe and a laptop to a clinic run by Guatemala's ministry of health in El Palmar, Quetzaltenango, Guatemala.



[3.5MHz transabdominal probe connected to a laptop]

There were six physicians who wanted to learn how to use the device in the clinic and we had only half a day to teach them. So a few months before the trip we asked them to watch, learn, and master five videos we had created and uploaded onto

YouTube showing basic orientation and sample scans with interpretation. Below is a screenshot for one of the videos we had created. We also created a dedicated website for the clinic (<http://elpalmarclinica.org/>) that has an organized list of videos for them to watch translated in Spanish.



[Screenshot of a sample teaching video on youtube]

During our trip we were pleasantly surprised at how well they had learned the material we had asked them to review in advance. The videos were useful because they taught basic concepts and probe orientation so that during our visit we could go straight into scanning live patients and did not have to spend any more time on the basics. We realized that basic orientation is something that can be taught easily through videos.

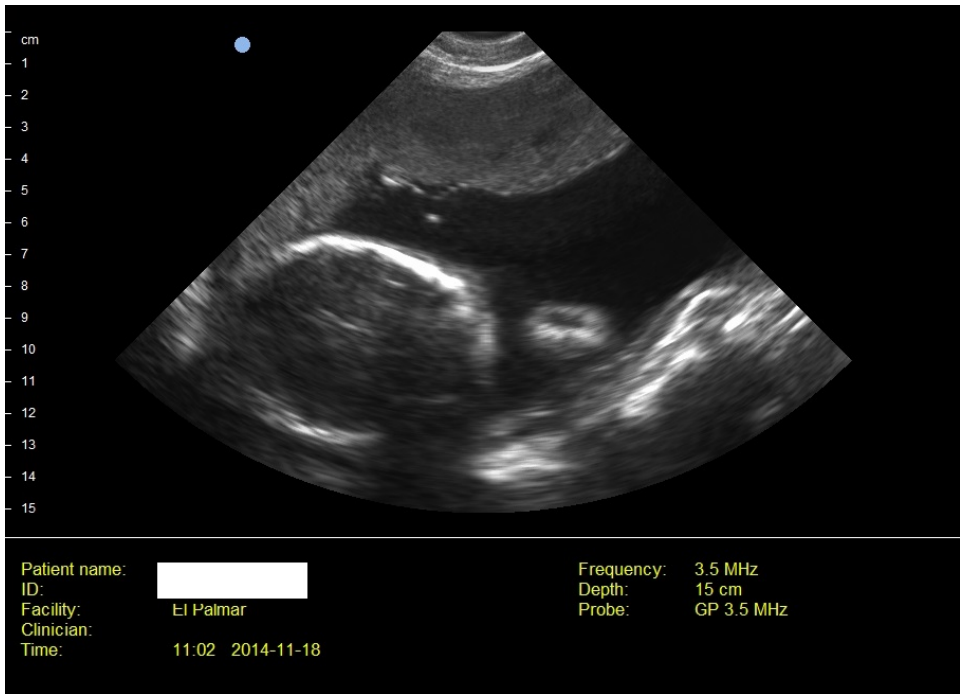


[Teaching clinic staff in El Palmar, Quetzaltenango, Guatemala during September 2014 trip]

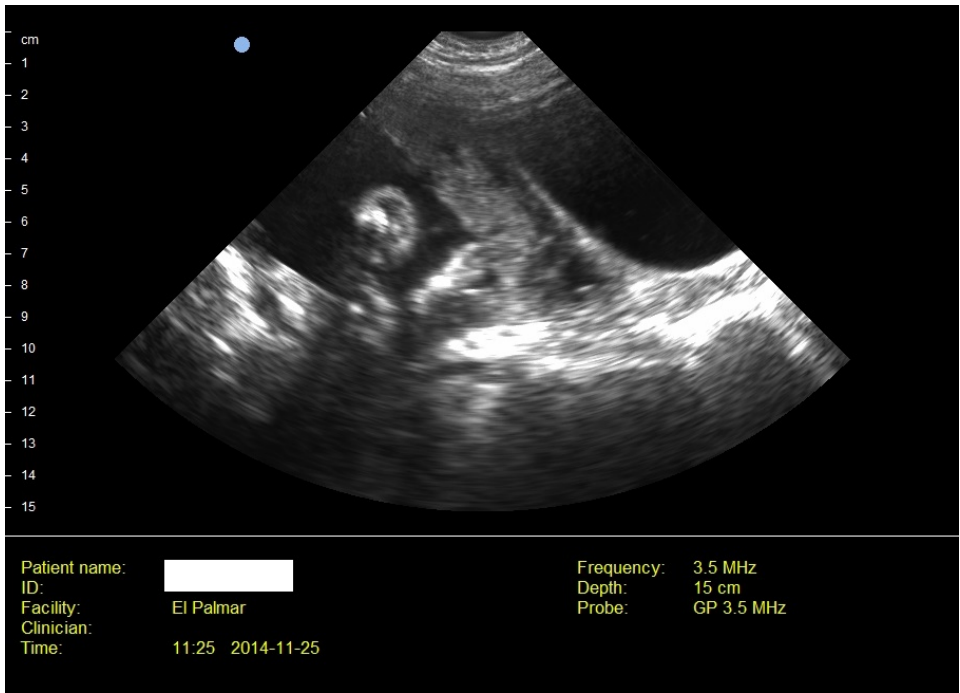
During the live training session we found out that they had no problem with identifying fetal presentation and locating the placenta but needed practice on following the placenta to identify its edge in relation to the internal os (essential skill for identifying placenta previa). Because they were so well prepared, we had enough time to teach them how to perform gestational dating using femur length, head circumference, and biparietal diameter. After the trip, we sent them a table showing corresponding ages for various femur lengths and biparietal diameters.

RESULTS:

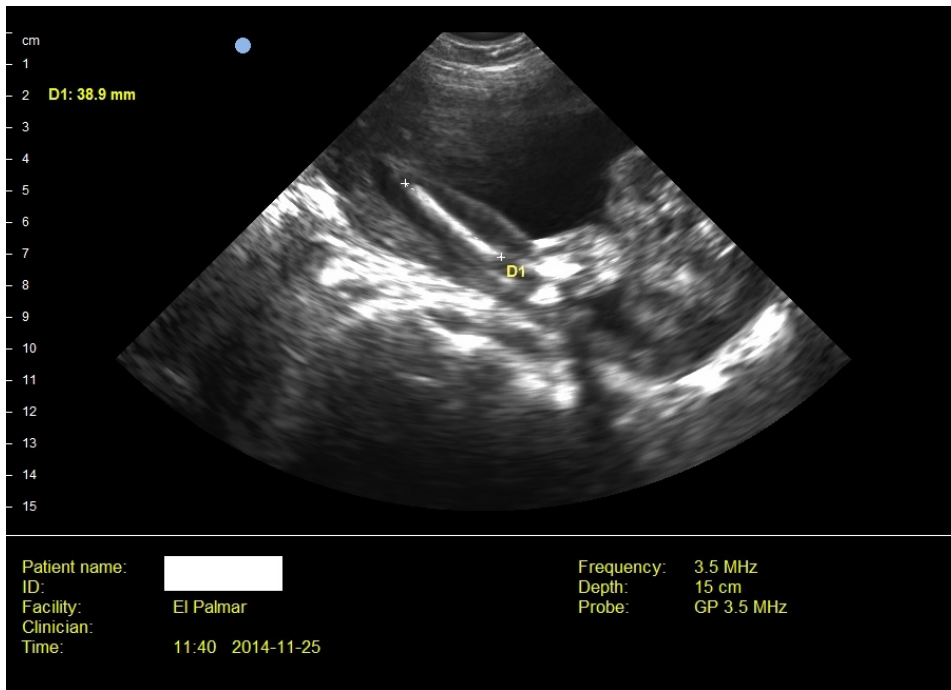
Three months after our September 2014 trip we received sample ultrasound images from the El Palmar clinic that clearly illustrates their competency:



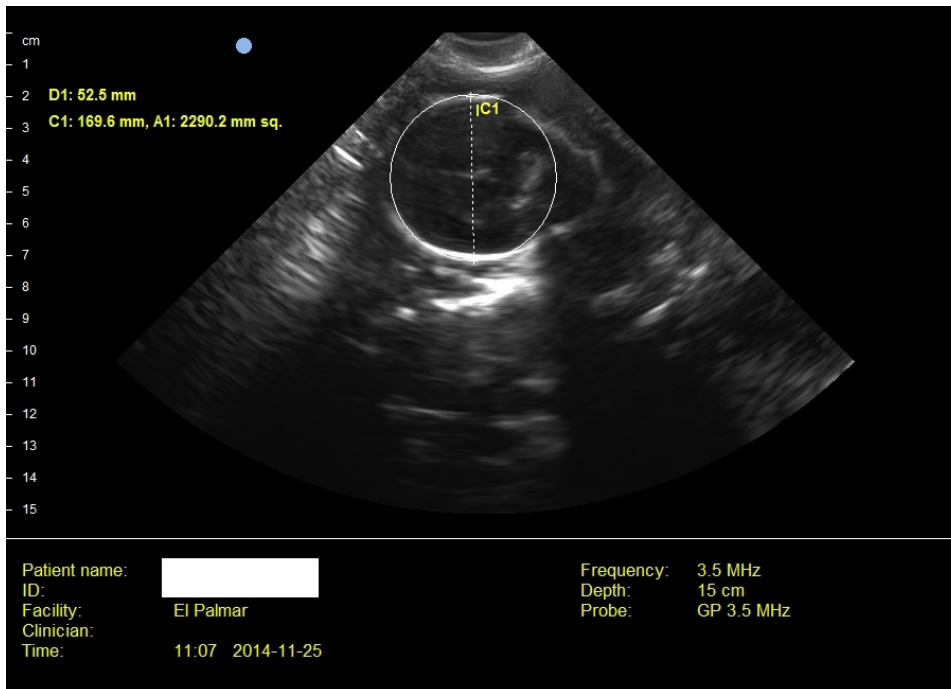
[Image sent from El Palmar clinic showing cephalic presentation]



[Image sent from El Palmar clinic showing low lying placenta]



[Image sent from El Palmar clinic showing femur length]



[Image sent from El Palmar clinic showing head circumference]

From the images sent by the clinic we can conclude that the equipment and the training we had provided was sufficient in teaching a clinic staff on how to perform a 20 week obstetric ultrasound. This outcome is better than we had anticipated and demonstrates that when combined with pre-visit training videos, obstetric ultrasound scanning can be taught to rural clinics during a short term trip (half day session in our case). We will continue to improve our ultrasound training program and enroll more clinics in both Guatemala and other underdeveloped areas of the world. We will add annual updates to this case study.