This year we have been experimenting with the capabilities in fetal diagnostics offered by HDlive on the Voluson® E8.

HDlive is an enhancement and modification to the Surface Rendering post-processing tool. It enables Voluson users to alter the position of the virtual light source, giving a more natural image display with optimized depth impression. HDlive is designed to enhance the 3D display of fetal structures and surfaces, helping the user to detect anatomical and surface abnormalities, such as cleft lips.

**Diagnosing cleft lips**

The diagnostic criteria for cleft lips are well known in sonography and establishing an exact diagnosis is not difficult. However, the criteria for aesthetic repair, requested of surgeons by parents during antenatal consultations, have not yet been established.

Echo-anatomy is very precise. In practice, the two anatomic planes are the white lip and the red lip (Image 1). We have been using HDlive to help us assess the ratio of red lip to white lip, both on the side of the cleft lip and on the opposite side, as well as to measure the size of the white lip, between the nose aisle and the red lip.

Our experience to date is that HDlive can be a useful aid in the diagnosis of cleft lips, one orienting towards a pathological process and offering better prognosis.

The choice of surgery technique – Millar or Tennisson - depends on the ratio between red and white lip on both sides of the cleft lip (Image 2).

If you think back just a few years, ultrasound examinations were generally two-dimensional. Remember how the first 3D images of fetal faces surprised the medical community?

Today, with our help, Volume Ultrasound has conquered the ultrasound lab, becoming the standard by which healthcare professionals analyze anatomic fetal details, and heralding advanced features including STIC, B-Flow or the Inversion Mode. The innovations continue – get ready to welcome new automatic biometry measurements on the Voluson E series.

Stay ahead of all these advances by joining your colleagues as a member of VolusonClub. Enjoy free access to a wide variety of educational materials and special membership rates for the 160 ultrasound training courses run each year by our International Academy of Medical Ultrasound. Lifelong learning is essential in today’s professional environment, so I invite you to come join us - and use your Voluson system to the max.

Your
Michael Stockhammer

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**EDITORIAL – Michael STOCKHAMMER**

Dear Readers,

The march of technological progress never slows, and when it comes to extending ultrasound capabilities, GE Healthcare is proud to be leading from the front. Our promise to you, our customer, is continual innovation, the tools to enhance your work as a healthcare professional and help in getting the most from your Voluson system.

Voluson® FOCUS shows how we put this promise into practice. This edition takes a closer look at HDlive, a 3D enhancement to Surface Rendering for obstetrics. Users can now alter the position of the virtual light source to get a more natural image display of fetal structures and surfaces with optimized depth impression. HDlive is designed to help in the detection of anatomical abnormalities.

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Your
Michael Stockhammer
Using ultrasound to diagnose tubal patency – a case study

One in three infertile women will present with a degree of tubal pathology resulting in the occlusion of one or both fallopian tubes. Consequently, the evaluation of tubal status is an initial step in the diagnostic workup of infertile women.

Transvaginal ultrasound is a diagnostic tool used to evaluate various pelvic conditions such as uterine malformations and endometrial pathologies that can be responsible for infertility, but it does not permit evaluation of the patency of the fallopian tubes. It is, however, a valuable technique for evaluating infertility as it is non-invasive, inexpensive, quick and easy to perform, and provides information on both pelvic disorders.

**HyCoSy**

Hystero-Salpingo-Contrast-Sonography (HyCoSy) is performed to assess tubal patency or occlusion in patients with infertility or who have undergone previous tubal surgery. HyCoSy was introduced in the early 1980s and is a simple outpatient technique. It can be performed in the same setting and at the same time as transvaginal ultrasound, giving additional information on tubal patency.

**2D HyCoSy**

HyCoSy is performed during the proliferative phase of the cycle (day 5 to 12). After inserting a speculum, a 5Fr salpingographic balloon catheter is placed in the uterine cavity and filled in with 1 to 2 ml of air. This ensures that the cervical canal is closed, preventing leakage of fluid and keeping the catheter in position. The vaginal ultrasound probe is then inserted and a transversal section of the uterus is taken to localize the interstitial part of the tube.

When the intruterine injection of contrast fluid is visualized by ultrasound, the contrast medium is first seen in the tube, if proximally patent, before spilling into the abdominal cavity, if distally and totally patent. Where there is tubal occlusion, the contrast medium remains concentrated only in the uterus or in the tubes. Where the contrast medium fails to spill into the abdominal cavity then further solution is injected slowly and with constant pressure. Should the procedure become intolerable, or at the patient’s request, then the examination is interrupted for a short period to allow the tubal spasm to pass. Common adverse effects include pelvic pain and cramps, for which analgesic drugs are administered after the procedure. Vaginal reactions, with symptoms including nausea, bradycardia, sweating and hypertension, are rare.

**Saline solution and other contrast media**

In initial studies, saline solution was applied transabdominally before performing transabdominal sonography. However, although excellent for visualizing intrauterine pathology (sonohysterography), saline solution is not particularly accurate in determining the state of fallopian tubes and their patency. Combining transvaginal ultrasonography with color Doppler sonography and/or ultrasound positive-contrast media increases the accuracy of this method.

The most simple and inexpensive contrast medium is saline solution mixed with air. Media such as albumin or galactose micro air bubbles are more stable and have a more echogenic appearance, making them easier to visualize moving through the tubes. The latest contrast media, gas microspheres, are used in Contrast Coded Imaging (CCI), their substantial harmonic response at low acoustic pressure making them clearer and visible for longer.

**3D CCI HyCoSy**

3D CCI HyCoSy is the most advanced development in HyCoSy, combining 3D sonography with CCI to automatically acquire the volume of the uterus and tubes and reconstruct the tubal course. Images can be stored, shared and analyzed with other clinicians. The method has a high diagnostic feasibility and is simple and reproducible.

Dr Caterina Exacoustos, Rome, Italy

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**Images:**

- HyCoSy with air bubbles: visualization of tubal course, note the overlapping with the surrounding tissues.
- HyCoSy with gel foam: visualization of tubal course with and without Contrast Tuned Imaging.
- HyCoSy with gel foam and different ultrasound techniques.
- Automated 3D CCI HyCoSy: multiplanar volume view of the gel foam in the uterus and tubes with and without Coded Contrast Imaging (CCI) and automated reconstruction of the volume.
Visualization methods for Corpus Callosum

Depending on which system and software options are enabled, there are several ways of achieving visualization of the Corpus Callosum:

- VCI-C
- OmniView
- Sectional planes
- Render mode

The first two techniques, VCI-C and OmniView, are optional features and may not be enabled on your system. The second pair, Sectional planes and Render Mode, can also be used to visualize the Corpus Callosum. Each of the 4 techniques is explained in greater detail in this article.

Corpus Callosum via “VCI-C”

Starting plane in 2D is an axial section, parallel to the skull base and midline of the brain – Cavium Septum Pellucidi must be visible. Adjust depth and focal position to optimize image representation and zoom when necessary.

Activate 3D, and select “VCI-C plane” as acquisition mode (Default VCI-C user setting is fine). Don’t forget to select an appropriate slice thickness – in case of the Corpus Callosum 3 – 5 mm. Move the horizontal dotted green line with the trackball to the midline of the fetal brain. If necessary, adjust the inclination of the line through the Z-axis (+/- 45°) and start the acquisition.

Adjust depth and focal position to optimize image representation and zoom when necessary. Activate 3D, adjust the ROI so that it includes the full skull, make sure that the volume angle is large enough (55° or more) and start the acquisition. Choose “Sectional Planes” and select your A-plane image (this should be an image similar to the one below) then activate OmniView, select Line and indicate the starting and end point on the midline in the A-plane. Confirming the endpoint will result in the image below:

A-plane

Corpus Callosum via “Omniview”

Starting plane in 2D is an axial section, parallel to the skull base and midline of the brain – Cavium Septum Pellucidi must be visible. The same level as where you would measure BPD and HC look at the image in the A-plane below.

Adjust depth and focal position to optimize image representation and zoom when necessary. Activate 3D, select “Render” (default rendering will do fine) and adjust the ROI so that it includes the full skull, make sure that the volume angle is large enough (55° or more) and start the acquisition.

A-plane

Corpus Callosum via “Sectional Planes”

Starting plane in 2D is an axial section, parallel to the skull base and midline of the brain - Cavium Septum Pellucidi must be visible. The same level as where you would measure BPD and HC look at the image in the A-plane below.

Adjust depth and focal position to optimize image representation and zoom when necessary. Activate 3D, select “Sectional Planes”, adjust the ROI so that it includes the full skull, make sure that the volume angle is large enough (55° or more) and start the acquisition.

A-plane

Corpus Callosum via “Render” mode

Again, your starting plane in 2D is an axial section, parallel to the skull base and midline of the brain - Cavium Septum Pellucidi must be visible. The same level as where you would measure BPD and HC (look at the image in the A-plane below).

Adjust depth and focal position to optimize image representation and zoom when necessary. Activate 3D, select “Render” (default rendering will do fine) and adjust the ROI so that it includes the full skull, make sure that the volume angle is large enough (55° or more) and start the acquisition.

A-plane

To enhance the contrast of the Corpus Callosum representation, VCI (Volume Contrast Imaging) can be activated via the touchscreen, selecting a size of 3 – 5mm. A similar visualization of the Corpus Callosum can be seen as below:

A-plane

Making full use of the built-in reporting solution

The OB department quickly recognized the value of ViewPoint reporting capabilities. “Today we can provide one standard report on all routine scans. We have standardized what we look at, the way we describe it and the indication and procedure codes we assign to it. Structured reports guide us through the examination, making sure nothing is missed and the final reports are generated with just a few mouse clicks,” said Dr. Bergman.

Improved efficiency to come

The integration request into the local HIS is currently queueing with similar requests from other departments. “I can’t wait for the day this is done. Once we have it, we just need a few clicks to generate our reports and the rest will be taken care of,” said Dr. Bergman.

Dr. Eva Bergman is Head Doctor in the OB department of the Academic Hospital in Uppsala, Sweden. The hospital has around 1,100 beds and is located 70km north of Sweden’s capital Stockholm.

For more information about ViewPoint please contact us at vpinfo@med.ge.com or visit http://www.gehealthcare.com/aeu/en/ultrasound/ultrasound-it/index.html
VolusonClub – a global meeting point for ultrasound professionals

Now numbering 11,000 members worldwide, VolusonClub is a truly international group of Voluson ultrasound users. Over 150 new users are signing up for free membership each month, keen to become part of this dynamic group of healthcare professionals, each determined to get the most from their Voluson system.

VolusonClub website gets a new look and feel

To honor this growth, the VolusonClub website has undergone a new look and feel, using the latest web technologies to offer users an even better online experience. Easy and comfortable to navigate, the VolusonClub website is your first port of call for catching up on local news, product updates, new releases and educational offerings.

Download white papers written by fetal ultrasound and gynecology experts, and view application video clips, with GE ultrasound experts walking you through the applications on your Voluson system.

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Be the first to learn about new ultrasound products and software upgrades. Discuss and exchange information with ultrasound users worldwide and learn about best practices in ultrasound from specialists around the globe. VolusonClub also runs Annual User Days in your region and hosts VIP lounges at major congresses.

New DVD collection for VolusonClub members

We are delighted to announce the release of Volume 2 of the Voluson Signature series of DVDs presented by

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The extremest sophistication of modern ultrasound technologies and the increasing number of applications on each Voluson system makes using your ultrasound system to its full capacity on ongoing learning experience.

Users benefit greatly from specialized training on the more advanced technologies, particularly on 3D/4D systems. Recognizing this, GE has established the International Academy of Medical Ultrasound (IAMU). The IAMU runs courses aimed at familiarizing physicians with the latest ultrasound innovations and applications and giving them the opportunity to benefit from the experience of respected practitioners in their field.

What started as customer training programs around a decade ago has now developed into a regular series of courses on ultrasound. Courses are now run on a regional basis, both at basic and advanced level, throughout Europe, the Middle East and Africa.

Advanced VISUS course

In order to meet the high levels of demand, the advanced VISUS course in Vienna is now being run three times a year, in spring, late summer and autumn. The course focuses on advanced 3D/4D sonography, examining basic procedures as well as the clinical relevance of 3D, and is run by Professor Dr. Kratochwil of the University of Vienna.

The 3-day course covers:

• Technical aspects of 3D/4D
• Obstetrics
• Gynecology: IVF, sterility, benign & malignant tumors
• Fetal cardiology

Discounts for VolusonClub members

VolusonClub members benefit from discounts on several courses, including the VISUS courses.

For further details of all these courses and discounts please see the VolusonClubCourse Activities 2012 course book, available to download from the VolusonClub website. You can also register for courses online.

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Dr. Marcin WIECHEC. Both Volume 1 and 2 are available exclusively to club members, either to view online or order, free of charge, from the club website.

Volumes 1 and 2 cover:

• Acquisition of right 2D image
• Fetal ultrasound volume
• Clinical cases
• New 2D features
• Volume Ultrasound in gynecology
• ViewPoint documentation

Simply log in to the VolusonClub website and order your copy.

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