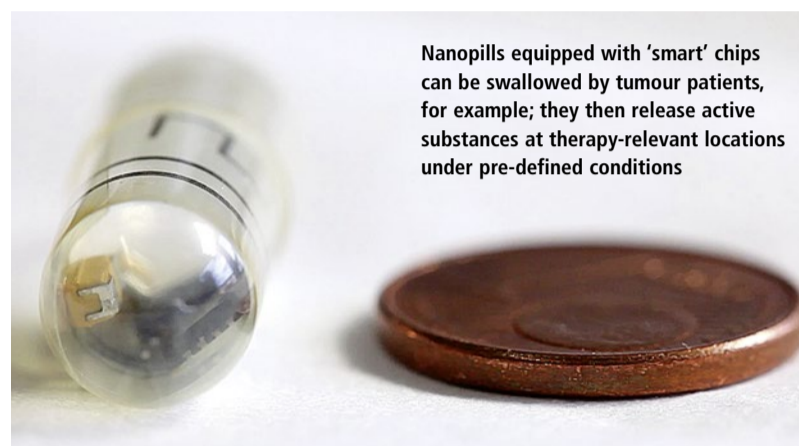




SPECIAL ISSUE: MEDICAL, TECHNICAL, PHARMACEUTICAL, INDUSTRIAL NEWS

DUSSELDORF • MONDAY • 16 NOVEMBER 2015

In the world of technology the term Industry 4.0 is already well known. Dr Bernhard Wolf, Professor of Medical Electronics at the Technical University of Munich, has revealed a comparable development in medicine, and is convinced that smart systems and personalisation have enormous potential



Nanopills equipped with 'smart' chips can be swallowed by tumour patients, for example; they then release active substances at therapy-relevant locations under pre-defined conditions

Medicine 4.0 - The term obviously alludes to 'Industry 4.0', through which we could follow the development from pre-industrial times via the introduction of the steam engine and electricity to full automation and computer technology. There have been similar developments in the world of medicine. Beginning with natural medicine, big advances arrived with the discovery of antibiotics and the introduction of X-ray technology. Tuberculosis was almost eradicated thanks to X-ray technology, and the rate of complications during surgery was considerably reduced through the use of antibiotics. A further important step forward was made because of nuclear magnetic resonance and semi-conductor technology.

individualised and optimally dosed treatment. It is even conceivable for medication to be administered directly to the tumour from a tank located within the implant. Personalised treatment appears particularly promising when it comes to the choice and dose of chemotherapeutics. As the metabolic condition of cells and tissues not only depends on genes but also on environmental conditions it is highly encouraging to characterise metabolic products and cell signals. We have developed electronic sensors that can monitor the metabolic state of cells directly and without auxiliary reagents. The reaction of cells to medication can be followed through changes of the oxygen concentration or the pH of the tissue.

Medicine 4.0

New technological opportunities will revolutionise healthcare

systems could supply these patients with their respective medication. American research teams are even working on an implantable system that is for use to treat allergies. Our American colleagues are assuming that allergies are ultimately caused by electric malfunctions in the tissue structure. The treatment is not carried out with medication but through electrical signals.

How do people accept these technological developments? Surveys show that the general public is usually a little sceptical towards technology in medicine. However, when it comes to the concrete application of technology for a specific medical problem the majority are

actually in favour of technological innovations. The clinical tests for a complex telemedicine system that monitors blood pressure, diabetes and obesity, showed that almost all patients accepted the system. It consists of a mobile telephone and sensors, which can measure blood pressure, breathing or blood glucose. The sensors transmit the data to the mobile telephone, which in turn is connected to a database. The patient can receive suggestions for treatment directly from the database, and the system also offers the opportunity to collate the data, so that doctors can keep a closer eye on high-risk patients. I am convinced that these new technological opportunities will revolutionise the healthcare system.



Bernhard Wolf is Professor of Medical Electronics at the Technical University of Munich

MAKE A NOTE:

MEDICA Health IT Forum

Medicine 4.0 – The medical electronics towards ingestible sensor and smart pills

Prof. Dr. rer. nat. Bernhard Wolf, TU München

Monday, 16th November, ● 12:00 – 12.50 p.m.

That era of Medicine 3.0 is characterised by improved X-ray and imaging procedures, as well as use of implantable pacemakers. Now we are on the cusp of a new era. Smart systems and personalisation will open up new opportunities for treatment with Medicine 4.0.

In which fields might those be? One important area is oncology. A project sponsored by the Federal Ministry of Education and Research, for instance, has developed an implant system for the selective monitoring of dissolved oxygen. In many solid tumours, lack of oxygen correlates with abnormal metabolic profiles and sensitivity to therapeutic radiation. A sensor placed in the immediate proximity of a tumour can register increasing hypoxia and therefore deliver important information on tumour activity, which can guide

We have developed a fully automated analysis platform that can produce a larger series of measurements in a short period of time. This is currently undergoing clinical trials.

Are there other areas?

A capsule containing a micro-camera has already been licensed for practical use – a development achieved by another research group. Patients can simply swallow this and do not have to undergo an endoscopy. Many other products are currently still at the experimental stage and demonstrate the principal possibility of miniaturisation, which basically we have received as a gift thanks to advanced developments in the semiconductor industry.

In view of demographic developments the care of dementia patients has developed into another important topic. Intelligent drug delivery

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New atlas will redefine OB/GYN imaging

Real-time virtual ultrasound turns fusion imaging on its side with a dynamic synchronisation of ultrasound with MRI

Using the Arietta V70 from Hitachi, a French diagnostic imaging team is rewriting the book on obstetrics and gynaecology. Entitled the 'Atlas d'échographie de fusion en gynécologie obstétrique', the new edition by Jean-Marc Levaillant MD, and colleagues from the diagnostic imaging centres at the Bicêtre and Créteil hospitals in Paris, will be published before the end of 2015.

Driving the excitement behind the new atlas are unique double views of anatomy acquired using the Real-Time Virtual Sonography (RVS) feature on the Hitachi Aloka Arietta V70 ultrasound system, according to Laurence Gitz MD at the Prenatal Diagnostic Centre at Bicêtre. 'Here we have a synchronisation of images rather than superimposing one image on top of the other, as with the usual fusion imaging. This means that we have a dynamic comparison with side-by-side viewing, which allows us to

focus more clearly on a zone of interest and scrutinise better the anomaly,' Gitz explained during a presentation at the French Radiology Congress.

The new atlas will include what she described enthusiastically as side-by-side views of a foetal cranium where the Hitachi echo images confirm a suspicion raised on the MRI images.

During the workshop, Naïma Chaïbi MD noted that there could be uncertainties and disagreements about a diagnosis among clinicians when the MRI and ultrasound images are viewed separately. 'In such cases where the condition is not clear on one modality, there is an advantage to bringing them together, in having both examinations simultaneously displayed,' she said.

Chaïbi currently leads a project to create a scoring method that will relate visualisations acquired by the Arietta V70 using RVS with an evaluation of risks for a patient. Originally developed for interventional radiology applications, Hitachi Aloka combined this new approach to fusion imaging with the company's deep experience in OB/GYN examinations to develop



Foetal brain sagittal view illustrated via Hitachi Aloka's Fusion Imaging (RVS)

the new application for the Arietta V70. After a scanner sequence is loaded onto the platform, a clinician clips a mini-sensor to the ultrasound probe that is tracked in a magnetic field projected from an antenna. According to Senior Product Manager Frédéric Philippe, the registration of the patient's anatomy with the scanned data set is so robust that it can maintain the accuracy of a synchronised ultrasound exam even where there has been a shift of organs, or a foetus has moved.

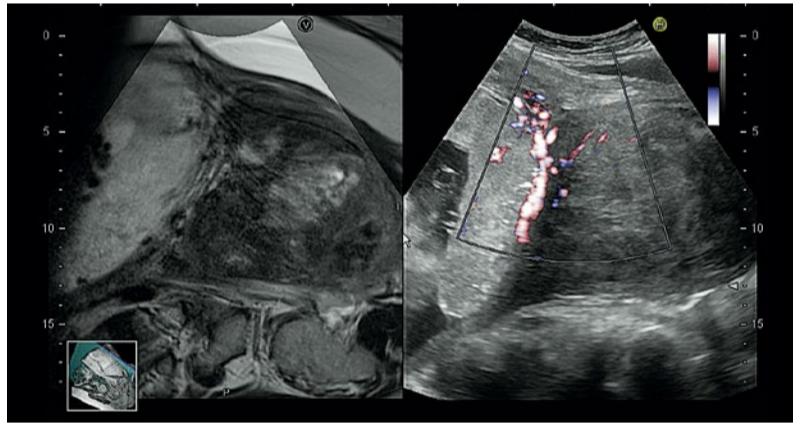
The lightweight and ergonomic design of the Arietta platform has been accelerated for the top-of-the-line V70 with the addition of high performance processing power that Philippe said is more than three-times more powerful than earlier versions.

The clinical advances Hitachi Aloka brings are the result of maintaining a horizontal, global approach to development that crosses ultrasound specialties, he added. 'We bring to OB/GYN advanced tools and technologies originally developed in other clinical specialties. For example, the speckle tracking developed for cardiology has been applied to obstetrics for track-

ing a foetal heart. In bringing fusion developed for the liver and kidneys to the foetal brain and have since shown the clinical relevance of echo fusion exams for diagnosing placenta abnormalities. Studies are now exploring cervical and ovarian cancers,' he said. 'We have stayed focused on a fundamentally different approach oriented to improving the clinical value of our technology. Sometimes ultrasound is used for clever marketing techniques, such as showing a snapshot of the unborn baby's face. But this does not have a lot of clinical value. Our goal is to precisely monitor the development of the foetus or organ and detecting any abnormalities as early as possible,' he said.

'As a result of this commitment, starting in the first trimester of pregnancy, a clinician can see a level of information with an image quality that has never been available before. Clinicians have told us they are now able to see specific conditions of a foetus several weeks earlier in its development by using our probes and imaging platforms.'

A suspicion of placenta accreta – detected with Hitachi Aloka's high-definition blood flow imaging (eFLOW) and illustrated with Fusion Imaging (RVS)



Flexi US sy

Dimensions fit individual places

Esaote specialises in designing and manufacturing diagnostic ultrasound systems and probes, shaping solutions to answer demanding clinical needs in any application, as the firm outlines, from abdomen to vascular, passing through musculoskeletal, internal medicine, cardiology, emergency and physiotherapy.

'Esaote's state-of-the-art technologies provide top image quality for confident diagnosis, from difficult-to-scan patients up to fully detailed superficial image resolution,' the firm points out. 'Our offer of transducers ranges from traditional phased, linear, convex, and endocavity to dedicated solutions for surgery and intervention.'

'Esaote's probe family is now enhanced by the brand new High Frequency Hockey Stick probe IH 6-18 and the biopsy dedicated convex transducer SI2C41. 'Customisable buttons on the probe body enhance comfort and increase possibilities.'

Advanced haemodynamic evaluation tools, such as XFlow and HD CFM, tissue stiffness evaluation with ElaXto and easy to perform real-time Fusion Imaging with the system's Virtual Navigator are examples of advanced technologies tailored to customer requests, the manufacturer adds. 'Virtual biopsy and needle enhancement technology are valuable tools to facilitate needle insertions from simple biopsies up to percutaneous treatments.'

Ergonomics and innovative design are also leading influences on the final products.

'Workflow optimisation and automation tools are designed in collaborations with important clinical and technical reference centres and Universities. Interviews and long scanning sessions with lots of ultrasound users from radiographers to radiologists and physicians, from surgeons to paramedics, have helped us to have a clear view of the different

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the possible uses needed by today's clinical trends, the company adds.

Then there's Esaote's EVolution, a continuous programme to update systems, bringing them the latest technological and clinical solutions

to match future standards. Inviting visitors to its stand, the Esaote team promise: 'We'll be glad to talk with you about our solutions designed for your work, from everyday clinical routine to advanced research.'



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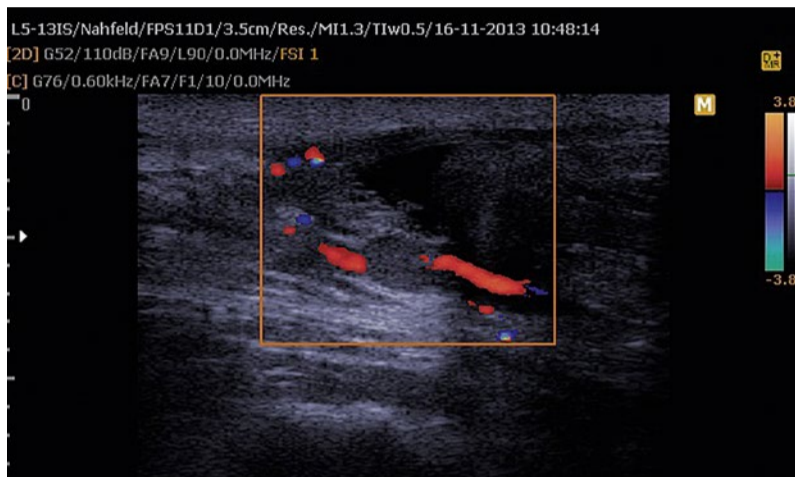
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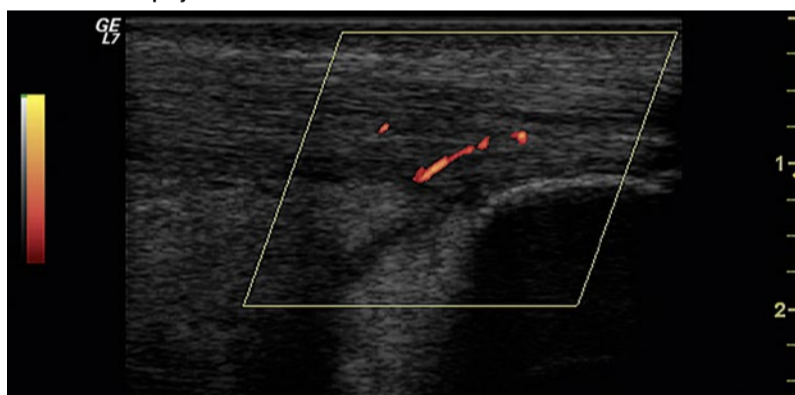


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Fresh rupture of the Achilles tendon in a 76-year-old male amateur wine maker

Achilles enthesitis with calcifications and increased vascularisation in a 70-year-old male tennis player



Ultrasound proves for Achilles tendon

An Achilles heel describes a human's weak point, but this is an ultra-tough tendon

Pain in the Achilles tendon can be caused by a whole range of indications. Dr Horst Sattler, a rheumatologist and specialist in sports medicine based at the Department of Internal Medicine at the Park Hospital in Bad Dürkheim, Germany, is an expert at differentiating between the various characteristics and indications using ultrasound. He is so renowned for this expertise that even orthopaedic specialists refer patients suffering Achilles tendon pain to him. Dr Sattler spoke with EH about the different causes of Achilles tendon pain and what is important in an ultrasound examination.

Undefined pain

Too much strain caused, among other reasons, by the running culture currently very much in fashion, can lead to Achilles tendon problems. The patient suffers, but can't specify exactly where it hurts. 'Patients experience pain around the Achilles tendon, the insertion point and the heel,' says Sattler, 'which can be

more precisely specified with the help of ultrasound.'

In 2007, an examination of 1,000 marathon runners showed that it was not, as had been expected, the knees that were the runners' biggest weakness but in fact the Achilles tendon. 'The most important pathological finding was the hypo-echoic distension of the Achilles tendon, a widening and sprouting of vessels, the so-called angioneogenesis. This was even more noticeable and occurred more frequently than possible problems with the knees,' Dr Sattler points out.

Ultrasound loves the Achilles tendon

'The Achilles tendon is a showcase for ultrasound with regards to the pathology of the tendons,' reports Sattler. 'It has a synovial tube just like the biceps tendon and therefore no fluid around the tendon which can swallow sound. In turn it can have hypo-echoic widening of the so-called Peritendineum externum.'

This can occur in isolation and can cause pain, as Sattler has already diagnosed in many patients. 'We can specify the pain in the Achilles tendon very accurately with the help of ultrasound. We can see whether peritendinitis is present, whether the tendon is directly intratendinous, whether it is the insertion point of the Achilles tendon which causes the pain (insertional Achilles tendinopathy) or whether the diagnosis may be bursitis, which can also occur in isolation.' Often a combination of the aforementioned problems may be present.

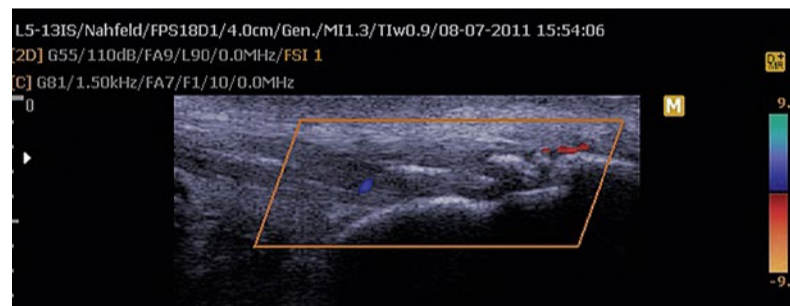
'As a rheumatologist I'm very interested in seronegative spondyloarthritis. Rheumatology patients frequently have problems with their Achilles tendons, such as those ankylosing spondylitis. But sometimes the patient may also have bursitis and changes to the Achilles tendons, which they are not aware of because they can't feel them. There's a very broad range of indications.'

What methods are used for specification?

'The best device is a high frequency transducer from 9 MHz and above,' says Sattler. 'We can use transducers up to 18 MHz. It's important that the Achilles tendon is examined length- and crosswise. The foot should be positioned over a roller and freely movable,' he explains, adding: 'The tendon must not be tense and the foot must be dynamic.'

The colour Doppler ultrasound makes it easier to detect the sprout-

Angioneogenesis with chronic tendinopathy of the Achilles tendon in a 56-year-old housewife



UROSTATION, A JOINT DEVELOPMENT BY SAMSUNG AND THE FRENCH FIRM KOELIS, IS PROVING A SUCCESS AT THE UROLOGY DEPARTMENT IN FÜRTH HOSPITAL

Prostate diagnostics: increased accuracy

Samsung and the French company Koelis jointly developed a urology workstation that combines the advantages of multiparametric magnetic resonance imaging (mpMRI) with the practical advantages of 3D ultrasound-guided biopsy in the diagnosis of prostate cancer. Linking these two imaging procedures improves diagnostic accuracy and supports planning for focal therapy

In mid-2015 the second generation of the ultrasound system H60 and the Urostation Touch was launched. At the Urology Department of the Hospital Fürth in Fürth, Germany the H60 and Urostation Touch are already being successfully used with 4 to 5 patients a week for prostate diagnostics. Patients who present with increased PSA levels undergo an mpMRI scan of the prostate since MRI achieves higher sensitivity in the detection of cancer lesions than other imaging modalities. "I have been a radiologist for

35 years and have been watching the development of multiparametric Magnetic Resonance Imaging – mpMRI – of the prostate from the very beginning," says Professor Josef Gmeinwieser, Medical Director of the Radiology Department at Klinikum Fürth. "Today, mpMRI yields much more reliable results than prostate ultrasound. While sonography has a 50 percent sensitivity in the detection of suspicious areas, diffusion and perfusion imaging multimodality MRI has been achieving a sensitivity of 80 to 90 percent."

Hand in hand: radiology and urology

"However, if a mpMRI finding indicates that a biopsy is necessary, it is rather difficult to perform it using MRI. It is much easier with ultrasound if you know where to take the tissue samples," explains Professor Gmeinwieser. Therefore these two modalities have been merged.

After an mpMRI scan was made, both the radiologist and the urologist assess the suspicious findings and decide on the areas to be marked for biopsy. Then the mpMRI scans of the prostate including the markings are loaded in the Urostation.

Using a 3D endocavity probe a 3D ultrasound image of the prostate is generated and sent to the Urostation where it is fused with the MR images. The 3D ultrasound image is used to guide the biopsy while the mpMRI data show the location of the tumours. As soon as the images are matched and fused, the physician performs a virtual



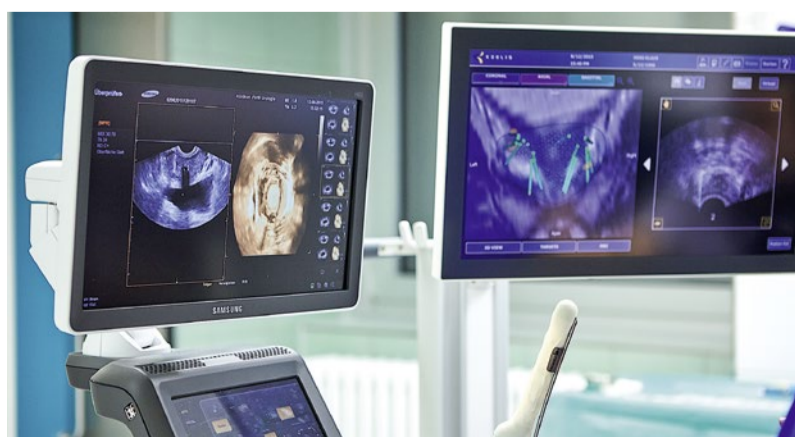
biopsy using the ultrasound image to control whether he would really "hit" the suspicious areas. Once the target is confirmed the actual biopsy is carried out. While the biopsy needle is still in the prostate the 3D images are transmitted to the Urostation where they are displayed to check if the target was hit. "With the Urostation we achieve high accuracy in the detection of tumours, especially aggressive and dangerous ones," says Professor Blana, who is Head of the Department of Urology at Klinikum Fürth.

Elastic fusion improve detection rate

The so-called Elastic Fusion technology matches the mpMR and 3D ultrasound images since the prostate shape changes despite its relative stiffness, firstly because the patient is in different positions during the ultrasound and the mpMRI scan and secondly because the 3D probe exerts pressure on the prostate.

No more superfluous biopsies

A biopsy is a stressful procedure



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Horst Sattler MD is a rheumatologist and specialist in internal medicine, as well as a specialist in physical and rehabilitative medicine. A former head of the Park Hospital in Bad Dürkheim he has authored four books and numerous other publications. Although he has been enjoying his official retirement since 2009, Sattler is still working in private practice and continues to work in the ultrasound department in the rheumatology unit for one day a week. He also still holds advanced training sessions in his particular areas of specialty, i.e. abdominal ultrasound and arthrosonography.

are caused by an inflammation or by other pathologies affecting the tendon.

What kind of treatment do patients receive?

'Initially they are given antiphlogistics, i.e. a standard anti-inflammatory treatment,' Sattler explains. Patients should also receive advice from someone specialising in sports medicine. Activities that expose the Achilles tendons to particular strain should either be reduced or temporarily stopped. 'Cryotherapy, i.e. a specific physical therapy, is also of benefit,' he believes.

Achilles tendon pain can also be caused by foot deformities. 'Therapy

to treat these deformities should then be considered,' he advises. 'Arthritis of the ankle also puts strain on the Achilles tendon. Sports medicine means giving the patient comprehensive advice.'

Conveniently, therapy monitoring can also be carried out with the help of ultrasound. The perfusion of the vessels shows quickly and reliably whether or not treatment is effective. 'If the flow recedes quickly under medicinal treatment, and if fewer vessels are intratendinous, the better the final result,' the rheumatologist concludes.

The position of the applicator over the Achilles tendon



ing of the vessels in the Achilles tendon: 'An intratendinous neovascularisation is a sign of destruction, or respectively intrusion of vessels into the Achilles tendon. These press on the nerves and cause the intratendinous pain,' he says. When the colour Doppler procedure is utilised it is important not to exert too much pressure so that the sprouting vessels remain clearly visible.

A new feature in the diagnosis of Achilles tendon problems is the use of elastography, which allows measurements of the different degrees of tendon elasticity. Additionally, Sattler adds that elastography can help detect whether the symptoms

PITAL, GERMANY

Accuracy

for any patient. Therefore any technology that helps to avoid multiple or unnecessary biopsies is highly appreciated by patients and physicians alike. Professor Blana: "The Urostation allows us to avoid repeat tissue sampling. During an untargeted biopsy you often fail to hit the tumour – and then, after a few weeks, you have to repeat the procedure if you continue to suspect a malignant tumour. With the Urostation usually one biopsy is sufficient as we hit the suspicious areas right the first time.

"In addition to the targeted tissue samples we sample 12 further locations systematically in compliance with current German guidelines."

Professor Blana moreover uses the Urostation as a tool for focal lesion therapy which requires extremely precise diagnostics. "Our experience with the Urostation is excellent," Professor Blana underlines, "The biopsy results are highly satisfactory. More and more patients ask for biopsy with image fusion."

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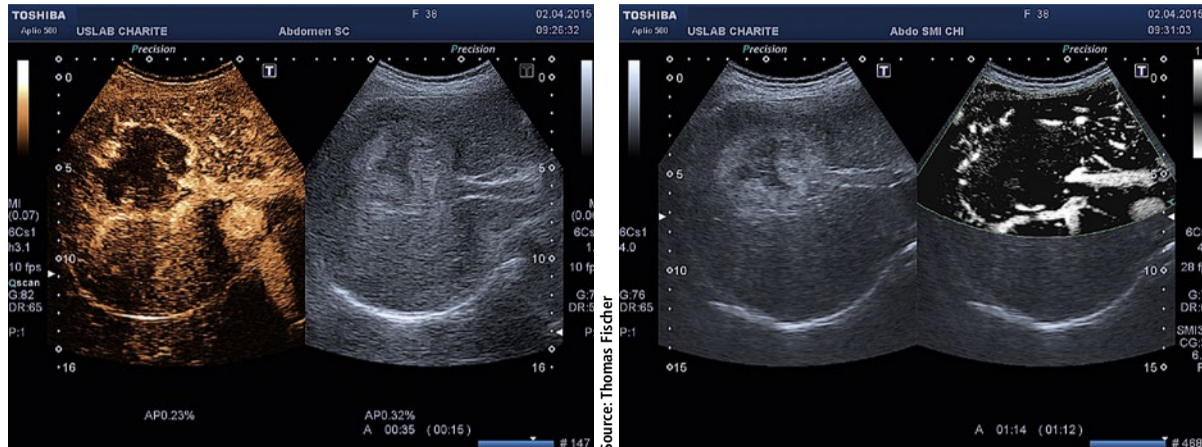
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In a whirlwind world tour, here's what they say:

Superb Microvascular Imaging
'Estimated very conservatively, I'd say that in around 20% of cases a different approach to treatment results from the use of Superb Microvascular Imaging (SMI),' reports Professor Thomas Fischer MD, Head of Ultrasound Diagnostics at the Institute for Radiology at the Charité Mitte Hospital in Berlin.

SMI is a Doppler imaging procedure that reacts a lot more sensitively to low flow speeds than normal Doppler imaging – with the added benefit of increased spatial and temporal resolution. The new version of the software has also reduced clutter artefacts that can affect the visualisation of perfusion. SMI can be used with contrast agents, can be visualised in 3-D and is compatible with more transducers.

In clinical diagnostics SMI proved to be a game changer.

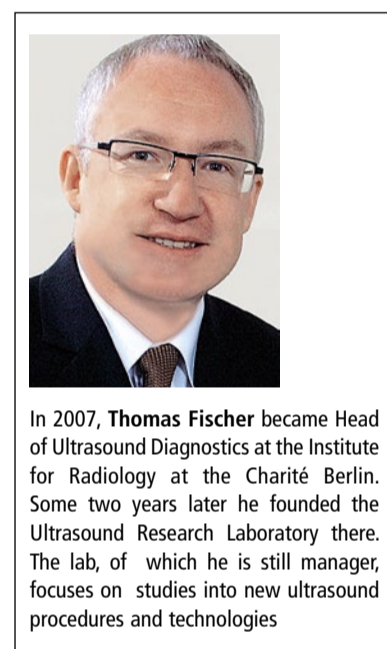
Fischer suggests this functionality can be used wherever the objective is the diagnosis of vascularisation and he sees a particular advantage for the diagnosis of liver disease and, specifically, cancers. After the wash-in and wash-out phases of the contrast agent, the examiner can switch to SMI, now optimised for use with contrast, and visualise vascular pat-

terns, long after the bolus injection, he explained. 'It is important for the detailed diagnosis to see how vessels grow into the tumour and to visualise exactly the vascular tree of the tumour, which is now also possible in 3-D technology with SMI.'

Meanwhile, half a world away at the Royal Melbourne Hospital in Australia, Robert Gibson MD finds Version 6 enhancement on the Aplio platform to be refined SMI and simplified its use with filter controls, which, he said, 'should prove a real clinical advance in displaying small vessel flow and vascular morphology.'

Shear-wave elastography
An essential innovation of the Aplio Platinum series was the introduction of the shear-wave elastography with propagation mode, also making it possible to visualise the propagation of the shear-wave generated in the tissue as a colour-coded image, while simultaneously measuring the absolute value of elasticity in a chosen region.

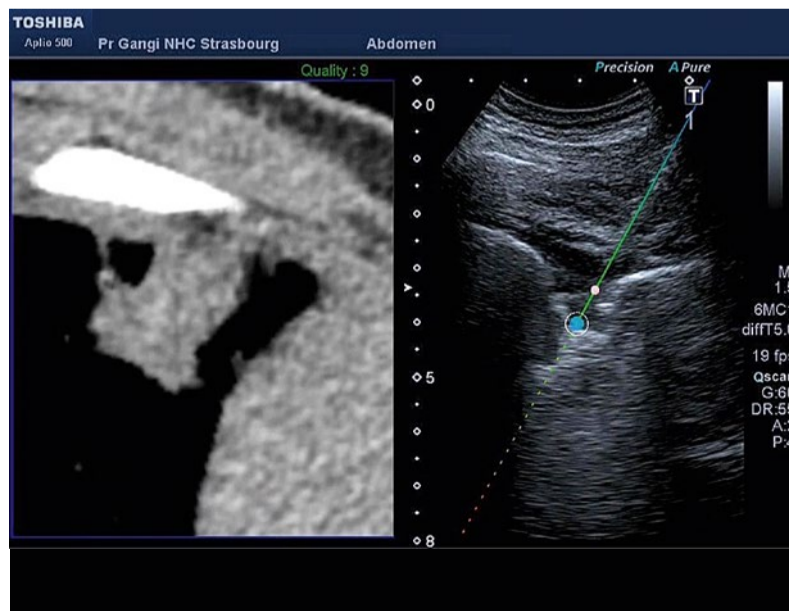
'Having these available in twin view allows a greater degree of confidence in selecting reliable regions of interest for elastography measurement,' Gibson said. Elastography mapping in general has been enhanced with the Version 6 upgrades to the Aplio platform, he added, with propagation map cleaner than ever. 'The Aplio 500 can indicate whether an elasticity measurement was successful, or not, because of the propagation mode, and the new version has even further improved this,' Fischer said. 'The examination procedure used to be a case of guessing the region of



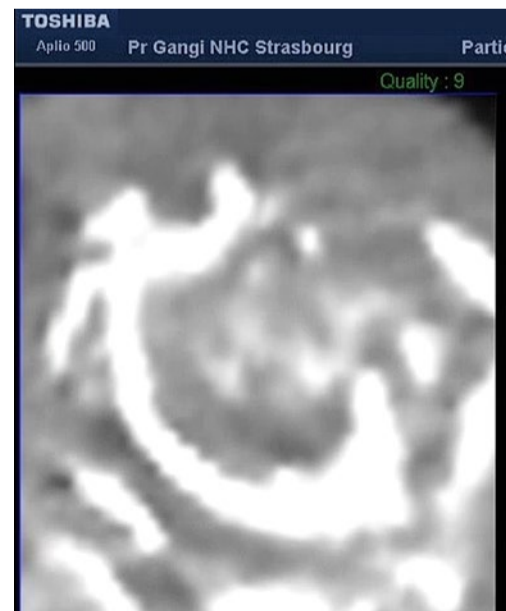
In 2007, Thomas Fischer became Head of Ultrasound Diagnostics at the Institute for Radiology at the Charité Berlin. Some two years later he founded the Ultrasound Research Laboratory there. The lab, of which he is still manager, focuses on studies into new ultrasound procedures and technologies

interest in a certain section of the image, starting the measurements and hoping that shear-wave signals were actually being measured. Now we can actually see whether or not the quality of the shear-wave propagation is adequate and then measure where propagation lines occur most evenly within the region of interest.'

'This enhanced functionality carries clinical impact,' he pointed out. 'It will lead to long-term changes for the diagnosis of liver disease. Whilst it is possible to diagnose fibrosis with the help of a biopsy, shear-wave measurements can document much larger sections of the organ. To me this makes more sense than examining just a small sample.'



Lung biopsy with thoracic contact to rule out malignancy: Smart Fusion allows the interventionist to find the lung lesion attached to the pleura easily – and even the smaller ones. The needle navigation improves his depth targeting confidence and makes the biopsy safer for the patient



Bone biopsy in a humerus fracture to exclude a bone n... interventionist to find the region of interest easily, without this system. Needle Navigation gives an extreme... it has entered the bone surface

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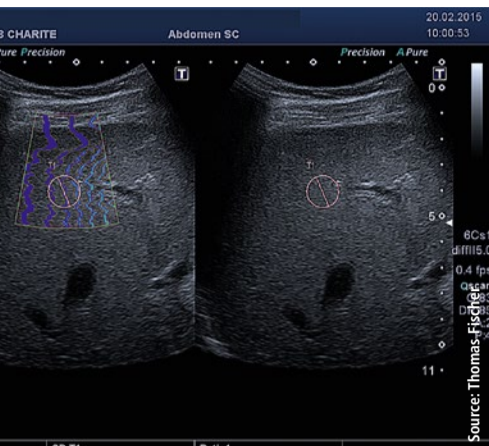
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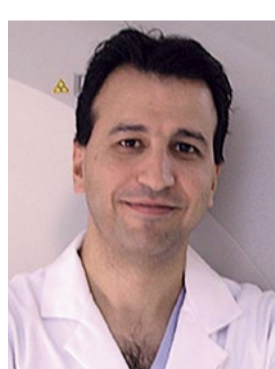
Toshiba is at Medica Hall 9 / D05



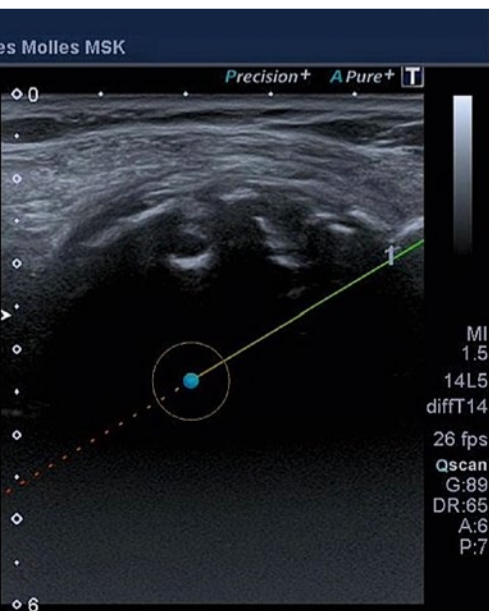
50-year-old patient has Hepatitis C and histologically confirmed stage three fibrosis. Shear-wave propagation on the left image. The ROI is determined within the area outside the vessels, which is free of artefacts and is simultaneously visualised on the B-image on the right to standardise the measurement

Fusion imaging and real-time 3-D needle tracking

Three rooms are equipped for interventional radiology at the University Hospital of Strasbourg in France and, according to the department chairman Afshin Gangi MD, 'They are packed with patients, completely full, because we are asked to do so many interventions. The majority of our cases are for biopsies, but patients



Afshin Gangi MD, is head of the department of Interventional Radiology at the Hospital of Strasbourg in France. He was educated at the International French School of Teheran, and graduated in 1980. During that summer he entered medical school at the University of Reims, in France, and gained his degree in 1987. He began his residency in Strasbourg in 1987, first in the intensive care unit of pneumology where he became excited about imaging and moved to the imaging department.



metastasis: Smart Fusion allows the which would not have been possible mely precise depth control even after

are lined up for ablations, as well.' When the upgraded needle-tracking capability arrived for the Aplio Platinum system, 'it was like adding a fourth room for biopsies and interventions,' he said. 'Once I have the image fusion and know where the tumour is situated, I can do the intervention anywhere I can correctly position a patient. With the Toshiba Aplio platform, I don't have to wait for the

CT or the MR room to be open.' Additionally, Gangi pointed out, 'The needle-tracking function is excellent, giving an ability to truly project the path for the needle into the lesion, and then keeping operating clinicians on-track, even in places where the actual needle cannot be visualised by ultrasound because of the bone structures or body fat. 'The system shows exactly where

the tip of that needle is and, even better, tells me if I am too high or too low. We can achieve far greater precision during biopsies now – more precise every time. With the help of image fusion and needle navigation we can now use ultrasound guidance for applications we would never have considered before, such as those of the bone or the chest wall.'

The ease-of-use and accuracy of

the enhanced image fusion software has also affected clinical routine and accelerated patient throughput, Gangi explained: 'Today the technicians can do this so that when the interventionalist comes into the room, it's done. This saves a lot of time, and I can tell you this is very important for us.'

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LEADING EXPERT POINTS TO SIX IMPORTANT INDICATIONS FOR AN ULTRASOUND EXAMINATION

Spleen – the forgotten organ

Although a small organ, the spleen can cause a considerable concern once it makes itself noticeable. Because this organ is rarely the cause of problems in the upper abdomen, most doctors tend not to pay it much attention. Professor Christian Görg, Consultant at the Department of Haematology/Oncology and head of the Ultrasound Department at the Centre for Internal Medicine, University Hospital Giessen and Marburg, is an exception. Through his background in oncology he has developed a well-trained eye for problems affecting the spleen, which, being the largest lymph node in the body, is particularly prone to cancerous diseases. When should an ultrasound of the spleen be carried out? Here Görg provides an overview



Christian Görg MD studied medicine, church music and protestant theology at the Justus-Liebig University Giessen. In 1992 he wrote his habilitation treatise on internal medicine at the Medical Faculty of the Philipps University in Marburg. From 1995 the professor has also served as a consultant in the Department of Haematology and Oncology at the Centre for Internal Medicine, in Giessen and Marburg University Hospitals and has also been head of the ultrasound department since 1996.

Perineal lesions

'Small lesions near the spleen are often detected during routine examinations. The objective then is to find out whether there is a serious pathology, or whether they may be just anatomic variations. Around 15% of the population have a so-called accessory spleen (see Image), which is a harmless nodule of splenic tissue located away from the main body of the spleen.'

sent as an actual clinical picture, but: 'We need to check whether the tissue is perfused normally or whether there is a functional asplenia/hyposplenia, that is, whether or not the spleen may have shrunk due to recurring infarctions (See image). This can be determined easily with the help of contrast enhanced ultrasound (image).' The use of echo enhancers works so well with the spleen because the tissue not only accumulates the contrast agent intensely in the arterial phase,

but also retains it for a long time during the parenchymal phase.

Large spleen

Possible causes for such a splenomegaly can be an infection such as glandular fever (Image 3), cirrhosis of the liver which leads to blood stasis in the splenic vein, or certain malignant lymphoma which go hand in hand with an enlarged spleen.

Inhomogeneous spleen

'Normally, parenchymatous organs, such as the liver and spleen, display an evenly homogeneous echotexture,' Görg points out. 'Occasionally this echo-texture may appear coarser (Image 4). Such inhomogeneous spleens are frequently found when infectious diseases are present, but they can also be caused by vascular pathologies. When the inhomogeneity is focal this can often be caused by splenic infarction. Again, this type of vascular pathology can be visualised with the help of contrast enhanced ultrasound.

Pain in left upper abdomen

The spleen is one of the organs most frequently affected by abdominal injuries. The initial question that needs to be answered is whether or not trauma is present. Is there fluid in the abdomen, or not? Is the spleen the cause of this bleeding, or not? Contrast enhanced ultrasound



Small spleen after radiation therapy of the spleen



Reduced enhancement in the contrast enhanced ultrasound



Hypoechoic round lesion as an incidental finding

suffer splenomegaly, which can rupture spontaneously (Image 5a). An intralial pseudo aneurysm, which entails arterial blood flooding the spleen, is life-threatening (Image 5b) and requires fast intervention or surgical procedures.

The focal round lesion

A biopsy is only rarely carried out in these cases, for example if an isolated splenic metastasis is suspected. Because the risk of secondary bleeding following puncture of the spleen is too high, the preferred option is to rely on the clinical anamnesis. In malignant lymphoma patients who have round lesions in the spleen, it

The small spleen

A small spleen initially does not pre-

Below: Accessory spleen



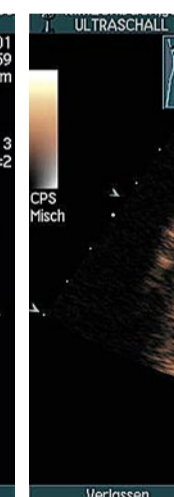
Large spleen in patient with glandular fever



Diffuse parenchymal inhomogeneity as an incidental finding



Spontaneous splenic rupture with liquid mass



Confirmation of an



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DIAGNOSTICS
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is assumed that these occur in connection with that systemic disease. In otherwise healthy patients, these round lesions, perhaps detected by chance, tend to be harmless.

Christian Görg always advises a small diagnostic tumour staging to be on the safe side, but otherwise recommends just to wait and monitor the symptoms (Image 6): 'Many colleagues find not being able to find clear answers to a diagnostic question difficult, but you have to be able to live with this. The uncertainty can be compensated for by diligence and by monitoring the patient closely with clinical procedures, including ultrasound.'

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Surgery and new operative techniques

ROOM 15

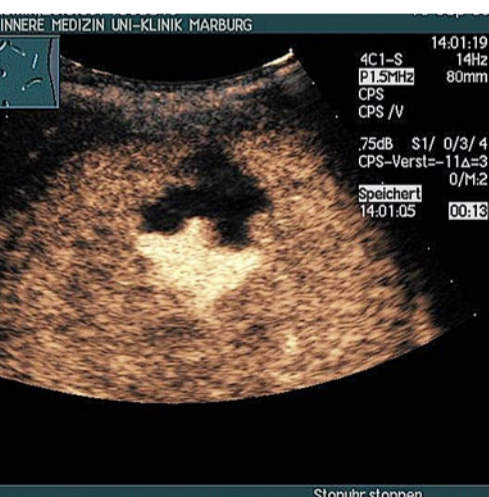
Monday, 16 Nov 2015 • 12.45 p.m. – 02.15 p.m.

SYMPOSIUM: Visceral surgery: Perspectives in hepatic surgery

ROOM 15

Chairman: Prof. Dr. Robert Schwab, Koblenz

- **12.45 p.m. – 01.15 p.m.**
Determination of the functional residual liver capacity
PD Dr. Martin Stockmann, Berlin
- **01.15 p.m. – 01.45 p.m.**
Klatskin tumour
Prof. Dr. Wolf Bechstein, Frankfurt/Main
- **01.45 p.m. – 02.15 p.m.**
Liver metastases
Prof. Dr. Hans J. Schlitt, Regensburg

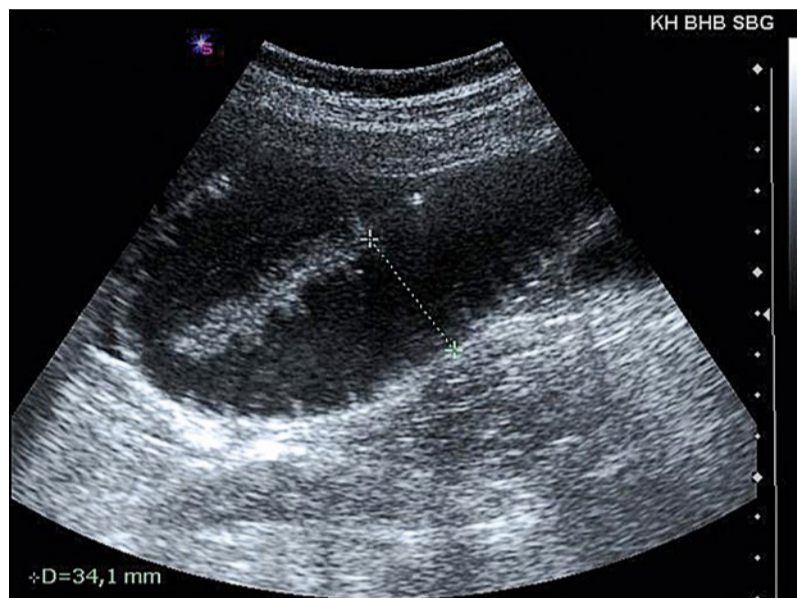


aneurysm on the contrast enhanced ultrasound image

ILEUS DIAGNOSIS IS A LONG-RUNNING DEBATE – PERHAPS WITHOUT END

Controversy surrounds intestinal obstructions

The guidelines – the Bologna Guidelines on the Diagnosis and Management of Mechanical Intestinal Obstructions as well as the respective guidelines from the American College of Radiology – recommend a plain abdominal X-ray and/or CT scan when an ileus is suspected. There is no mention at all of ultrasound in these guidelines. However, many clinicians do not agree with this. 'In our hospital we haven't actually carried out plain abdominal X-rays for patients with acute abdominal pain for the last 20 years,' emphasises Dr Alois Hollerweger, Consultant in the Department for Radiology and Nuclear Medicine at the Hospital of the Brothers of Mercy in Salzburg. 'For us, the primary imaging modality for these cases is always ultrasound. The plain abdominal X-ray is not sensitive enough for to diagnose acute abdominal pain.'



In most cases, an ultrasound scan can confirm the presence of the three most important criteria for ileus - dilated, fluid-filled intestinal loops, active peristalsis (early stage) and sudden change of the lumen (sudden change in diameter). A plain abdominal X-ray on the other hand does not help with the assessment of the peristalsis in the intestine, and other impending complications cannot be captured, either, Hollerweger explains. Furthermore, intestinal obstructions can be diagnosed around 6- 12 hours earlier with ultrasound than with plain abdominal X-rays because, in the early stage, the intestinal loops are not yet strongly dilated but already filled with fluid, which can only be seen on the ultrasound scan. Ultrasound also facilitates a more differentiated diagnosis 'The ultrasound image also shows possible other causes of acute abdominal pain, such as renal congestion or biliary colic. The X-ray on the other hand makes no contribution to a differential diagnosis,' Hollerweger stresses.

He does not accept the oft-cited argument that the abdominal X-ray visualises the fluid level in the intestines well. 'This may be the case – but the level is only an indirect sign that there may be air and fluid in the intestines. Ultrasound allows the direct detection of the fluid.' Hollerweger believes that the reason why so many hospitals carry out plain abdominal X-rays when an intestinal obstruction is suspected is mostly

Sample images for a mechanical obstruction of the small intestine:
Fig. 1: Fluid-filled and dilated loops in the upper small intestine

organisational: 'A plain X-ray can be carried out at any time during the day and night without the presence of a radiologist. For smaller hospitals this is a simple way of carrying out an initial, basic diagnosis outside the standard times of operation. Interestingly, the abdominal X-ray is something surgeons still insist on, in large hospitals as well.' Another reason for ignorance about ultrasound in the guidelines is most probably the situation in the United States, where it is not clinicians, but members of



Fig. 3: Coronary reconstruction. The loops in the small intestine are dilated and fluid-filled, the large intestine (white arrows) is largely contracted

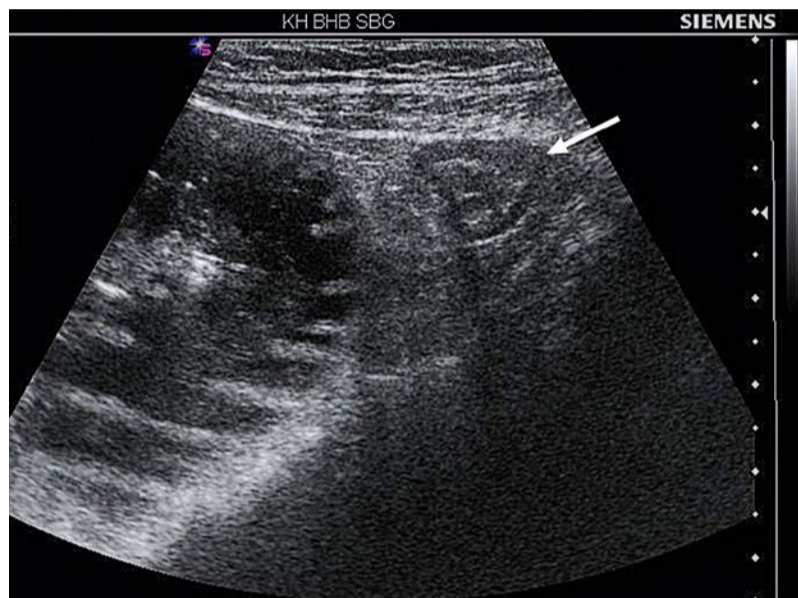


Fig. 2: Next to the dilated intestinal loop is the contracted colon (white arrow)

a specifically named profession, i.e. sonographers (radiographers) who carry out ultrasound examinations.

The guidelines and ultrasound examiners agree on one thing: the follow-on examination procedure of choice to establish a diagnosis should be CT.

'When an ultrasound scan does not deliver a result in cases where an intestinal obstruction is highly suspected, then the next diagnostic step should be a CT scan,' Hollerweger emphasises. A CT scan is also indicated for obstructions of the large intestine, not least because the most common cause of these is cancer.

In conclusion, this experienced ultrasound trainer offers some practical tips. In most cases of ileus there is gas in the intestines. When the patient lies on his back this rises to the front. 'Therefore, it's very important to apply the transducer in the lumbar region.'

He also recommends a clear system for the examination. 'Firstly, you should check via the side and spleen whether or not the stomach is full. Secondly, you need to check the upper small intestine via the left lumbar region, and check whether the adjoining large intestine is contracted.'

'Finally, you must check in the right, lower abdomen whether the lower small intestine has collapsed, or whether congestion continues to

the large intestine.' Afterward this, you need to try and narrow the site of the obstruction down – even more precisely.'

Hollerweger advises all colleagues to regularly update their knowledge of the gastrointestinal tract: 'Practice makes perfect!'



Alois Hollerweger is a Consultant in the Department for Radiology and Nuclear Medicine at the Hospital of the Brothers of Mercy in Salzburg. The key focus of his work is ultrasound diagnostics, particularly ultrasound of the gastrointestinal tract. He has 44 scientific publications on this topic to his name. Born in Upper Austria, the radiologist, who read medicine in Innsbruck and specialised in Salzburg, is a much in demand instructor: Hollerweger holds ÖGUM courses and also regularly runs courses in ultrasound for the abdomen, gastrointestinal tract as well as for Small parts

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Interfacing to large matrix arrays

The high channel count, open, embedded-ultrasound system

Cephasonics is at Medica
Hall 16 / D40-1

New ultrasound applications are being investigated in areas such as capacitive micro-machined ultrasonic transducers for 3-D imaging, unique-geometry transducers, elastography and photo-acoustics. 2-D arrays for 3-D imaging can display details never seen before and bring earlier diagnosis for tissue characterisation of the breast, prostate or liver, for example.

Elastography can measure tissue stiffness and open up new diagnostic possibilities. The photoacoustic ultrasound modality can visualise the internal structures and functions of soft tissues with applicability in areas

such as breast cancer screening and vascular disease assessment.

Shear-wave elastography imaging is a technique with vast potential for medical diagnosis due to its higher contrast properties compared to traditional B-mode or harmonic imaging. After generating a push pulse, a shear-wave is created in the tissue area. Capturing the shear-wave with a large ultrasound matrix array, and then generating and processing volumetric data can lead to research breakthroughs and, eventually, new clinical diagnosis methods for many diseases.

Clearly, R&D followed by eventual clinical adoption of new diagnostic techniques in fields such as these requires a high-channel-count (HCC) ultrasound system that can interface to large matrix arrays.

Cephasonics, based in Silicon Valley, California, provides a flexible, open embedded-ultrasound platform, the cQuest Griffin

HCC system, available in configurations that scale from 512 to 4096 synchronised channels '... enabling unprecedented ultra-

sound innovation that can be carried forward into OEM production,' the company reports. 'Other configuration options include 1:1 or 1:3 probe multiplexing, transmit-module options, multi-probe modules and encoder-interface modules.'

Clinical-quality imaging capability is a hallmark of all cQuest systems, the firm adds. 'This is requisite when moving from experimental devices in the lab to diagnostic products used in clinics. Incorporating advanced image-processing algorithms, the real-time, user-adjustable ultrasound image-enhancement software enhances anatomic structures with simultaneous speckle reduction and includes filters optimised for anatomy-specific details of texture, scale and morphology.'

'The Cephasonics cQuest Ultrasound Software Development Kit (CUSDK) suite provides a fast way to develop ultrasound-based products with pre-tuned configuration files and turnkey example applications. An entire family of products can be easily realised since the software only needs to be written once. Flexible data processing with custom algorithm extensions is unique to Cephasonics.'

'Developers can select the optimal signal format for their use case, add proprietary signal-processing algorithms, and synergise with the clinical image-processing stack.'



BLOOD, WATER AND BONE FRAGMENTS CAN CAUSE MANY REFLECTIONS

Swedish hospital endorses image

The ENT department of Uppsala University Hospital, one of Sweden's largest university hospitals, has tested an Ikegami medical grade camera, recorder and monitor for ear operations. The ENT department diagnoses and treats children and adults with ear, nose and throat diseases, with basic and highly specialised care.

In such operations, a mixture of blood, water and bone fragments tends to create a lot of reflections in the image, so very high picture quality is necessary. The ENT department needed to record each operation in high quality video for advanced research activities. 'Ikegami's MKC-700HD high-end medical grade camera could deliver clear images even with different combinations of objects, colours and reflections,' the company reports. 'This was achieved by setting each parameter optimally. Our MLW-2623C high quality medical grade monitor makes it possible to reproduce the image in full 1920 x 1080 high-definition. The MDR-600HD records in full HD resolution during each operation.'

'This is a perfect camera for this type of application,' confirmed Lennart Edfeldt MD PhD, at the Oto surgery/ENT department. 'We are very pleased with the colour reproduction, sharpness and especially the ability to reduce reflections in critical phases. The company's MLW-2623C monitor has a high level of bright-



Ikegami MKC-700HD 3-CMOS camera, 26 inch LCD video displays and full HD recording unit being tested in the ENT operating room at Uppsala

Ikegami MLW-2623C medical grade monitor being tested in the ENT operating room at Uppsala University

ness, high resolution and a wide viewing angle. It also provides a high level of continuity in image quality. The Ikegami MDR-600HD allows us to record images and photos in crystal clear high-definition via an intuitive front control panel. It should prove very useful for research work after each operation.'

The firm's MKC-700HD high-end medical grade camera employs a 3-CMOS sensor to achieve full high-definition 1920 x 1080 pixel resolution images. Sensitivity is approximately 40% higher than on the standard model and it can perform better even at the low illumina-

tion surgery, the company reports. 'Optimised signal processing circuitry delivers a high signal-to-noise ratio of 54 dB.'

The MLW-2623C medical grade monitor employs a full high-definition 1920 x 1080 pixel resolution panel for displaying extremely fine images, the firm adds. 'Images can be viewed comfortably from almost any angle. The LCD panel has a high response speed to ensure minimal after-imaging. 10-bit signal processing ensures smooth image gradation. A high quality internal processor converts interlaced source signals into natural-looking progressive-scan

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United Imaging is at Medica Hall 16 / F04-2

The new **iuStar600** ultrasound system from the manufacturer United Imaging System is '... powered by a revolutionary hybrid uMatrix beam-forming engine for unmatched high frame rate and colour sensitivity,' the manufacturer reports. 'Equipped

with the new generation HD transducers, automated image optimisation tools, versatile capabilities, ergonomic design and intelligent workflow, the iuStar600 redefines excellence in the mid- to high-end shared service segment.'

The system sits on a 19-inch large display, with a slim 11-inch touch panel. Featuring a wide array of ergonomic tools, iuStar600 is designed to speed workflow and simplify daily clinical work, United Imaging adds. The standard configuration with

five-probe connector also enables a broad range of clinical applications. The unique LED lighting transducer sockets also help when scanning in a dark environment, the firm points out. 'No matter if you are a beginner in general imaging, or you want

to explore more into breast stiffness tissue quantification in Women's Healthcare, or maybe you are looking to have more automated tools for cardiovascular, iuStar600 answers all of these in one system,' United Imaging confidently reports.



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images free of jagged line artefacts.' In addition, the MDR-600HD medical grade recorder is reported to record high quality SD/HD video and still images (640 x 480 to 1920 x 1080). 'Simultaneous recording on internal HDD and external USB device ensure data reliability. Three-way recording is available. Still images can be saved during video recording. Video or still images can be reproduced during the video recording process.'

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Peri-operative ultrasound monitoring

Sonoscape is at Medica Hall 09 / Stand E25

Using SonoScape's S9 hand carry ultrasound system, students and staff from the Department of Radiology/ Ultrasound and Anesthesiology at Sidney Kimmel Medical College of Thomas Jefferson University recently finished a study of mechanisms related in the cause of radial artery catheter failure. Radial artery cath-

eters (RAC) are commonly used in the emergency department, operating rooms and critical care units of a hospital to accurately monitor the arterial blood pressure and acquire blood samples. With the use of SonoScape's S9 ultrasound system, the researchers hoped to discover why RAC fail prematurely and the



S9's cross section ultrasound image of a catheter post insertion within a patient's radial artery.

causes of complications related to RAC clinical use. The clinical trial was designed to determine the causes of RAC failure and to confirm if a low artery diameter to catheter diameter ratio leads to decreased local blood flow and thrombosis. For this IRB-approved study, 25 patients

requiring a RAC for clinical care were enrolled. To evaluate and monitor the RAC insertions as well as blood flow dynamics in the radial and ulnar arteries, the 25 patients were scanned with a 12 MHz linear array probe before RAC insertion, immediately after, and intermittently during the day and the night (for 24 to 36

hours). By using the S9 ultrasound, they were able to literally see what was happening in the ulnar and radial arteries of the patients.

Using the S9's grayscale and Doppler technology, measurements were taken of blood flow and the diameters of both the ulnar and radial arteries. Assessments of RAC insertion factors also allowed for measurements for the composite vessel trauma score for respective arteries after insertion. To analyze the data, a paired Student t-test and a Wilcoxon Rank-Sum test were used to compare results. For the purpose of the study, a RAC initial failure and final failure were classified as difficulty/inability to aspirate blood through the RAC or a dampening/loss of the blood pressure waveform.

A total of 211 ultrasound scans were obtained from the 25 patients. From the 25 patients, 21 experienced a RAC initial failure and four patients experienced a RAC final failure. Each failed for a different reason: ranging from the catheter being outside of the vessel and in the subcutaneous tissue, the RA catheter tip was against the arterial wall, thrombus on the catheter tip partially/completely obstructed the RA catheter lumen, and thrombus within the RA lumen partially/completely obstructed RA blood flow.

Soon after RA catheter insertion, the RA and UA inner diameters increased from 2.21 ± 0.4 mm to

RA scanning using SonoScape S9 Ultrasound Unit (Shenzhen, China)



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Easy to learn yet high performance US

Siemens is at Medica Hall 10 / Stand A20

The Acuson NX3* and Acuson NX3 Elite*, two new ultrasound systems from Siemens Healthcare, are on show at this year's Medica Trade Fair. 'Both mid-range systems offer a simple, intuitive interface combined with innovative imaging solutions for examinations primarily in general medicine, obstetrics/gynaecology, paediatrics and neurology,' the manufacturer reports.

The Siemens Acuson NX3 features a new way of scanning with three times more customisable keys and faster workflow with 28% fewer keystrokes (data based on comparisons with competitor scanners using publicly available documents). 'The customisable control panel and touch screen combined with Siemens innovative workflow innovations make it possible to perform certain routine anatomical measurements up to 76 percent faster than traditional solutions,' the firm adds. 'The Acuson NX3 systems are equipped with the largest LED monitor (21.5") and the biggest touch screen (10.4") in their class, improving time to report.' For daily routines, the Acuson

NX3 systems feature advanced ultrasound innovations, including Clarify Vascular Enhancement technology. 'This Siemens exclusive technology provides multiple levels of clarification to optimise tissue contrast reso-



ACUSON NX3 ultrasound system



Uterine midline view with the EC10-5 transducer

lution and definition of both tissue and vessel walls.'

Higher image resolution is enabled with the firm's 16 MHz transducer, especially suitable for breast and musculoskeletal imaging. 'Another exclusive solution is the 220-degree endocavity transducer, which offers up to a 75 percent larger field of view than standard probes,' Siemens adds.

Susan Black, Programme Director and Senior Sonographer at Mercy Medical Center, in Canton, Ohio, USA, adds that use of the Acuson NX3 is simple to learn. 'It's easy to use, easy to learn, and this helps when I'm training staff because I don't have to spend a lot of time teaching them how to use the system. We can get patients in and out a lot quicker.'

Users of these ultrasound systems are provided with a wide range of services, including access to Siemens' 24-hour remote service with its selection of online services. Optional add-on applications give healthcare pro-



Case 1: US scan taken shortly after the nurse was unable to draw blood. The US over the RA revealed that the catheter was no longer in the vessel lumen but instead in the subcutaneous tissue, adjacent to the artery



Case 2: When dampening of the BP waveform, the US image showed the catheter tip to be positioned against the vessel wall. This event was intermittent. The waveform returned to normal when the catheter tip was more centred

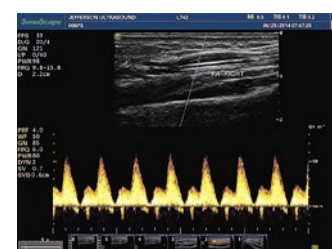
blood draws was 5 ± 3.3 . Median time to initial dampening of the RA waveform was 5.9 hours in 22 different cases.

By using the S9's color Doppler, the team was able to measure the velocities in the RA and UA arteries after RAC insertion. In the RA artery, the peak velocity decreased from 56.2 ± 18.7 to 36.6 cm/s after the RAC was inserted. Peak velocity in the UA however, increased from 53.7 ± 19.3 to 63.4 ± 20.5 cm/s after insertion of the RAC. Ultrasound scans also did not indicate a difference in vessel diameter or blood flow velocity when comparing successful

RACs to that of the four that developed a final failure; however this may be attributed to the limited number of final failures that were observed.

There was also no difference in velocity patterns or in diameter in the RACs that failed compared to those that did not fail.

The conclusions from this study are threefold. Both the RA and UA experienced significant dilation after RAC insertion. The data suggested that vasodilation and increased blood flow around the catheter may help to prevent thrombosis and protect the function of the arterial catheter. In some patients, the peak blood flow



Pre and Post Insertion of RAC Peak Blood Flow Velocity Doppler Ultrasound

velocity significantly decreased after insertion of a 20 g catheter, especially in RA with a small inner diameter. With the S9, in vivo observations were possible to reveal what caused RAC failure during the patient's clinical course. Failures consisted primarily of torturous vascular anatomy and RAC tip obstruction, thrombus formation on the RAC tip, and partial/complete thrombosis of the RA lumen.

2.54 ± 0.45 mm and from 1.91 ± 0.44 mm to 2.23 ± 0.48 mm respectively (no significant differences in RA and UA diameters).

For the 24 RACs that did not have a final failure, the median number of cannulation attempts was 9 and the median CVTS was 8.5. Comparatively, the CVTS for the four RACs that developed a final failure was 8.3 and the mean number of

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*Acuson NX3 ultrasound system is not commercially available in all countries. Due to regulatory reasons its future availability cannot be guaranteed. Contact a local Siemens organisation for details.



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FOR THE OPERATING THEATRE

The 43 LEDs shadow-less lamp

The Italian firm Acem Medical Company has a truly impressive range of medical lighting, sharing the firm's special LED optics to generate a shadow-less, clear and homogeneous light. The model StarLED5 NX is no exception, generating an IR-free light, excellent colour temperature and a practically endless life cycle at low consumptions, the manufacturer reports. 'The 43 LEDs that make the StarLED5 NX are circularly positioned and divided into five reflectors (with seven LEDs each) and other eight LEDs are radially placed around the handle. In this way, the lamp produces a high illumination level of 130,000 lux (160,000 lux optional) for a steady life cycle of about 50,000 hours.'

ACRIS ensures, by the use of a microprocessor, control of electrical curves typical of LEDs remain unaltered over time but maintain a long life cycle. The colour rendering index of this lighting is 95 and colour temperature 4,500°K. These two values allow the exact chromatic scale of the colours of the human body to be reproduced, the firm points out.

Focused and ambient light

To achieve the right illumination to meet different needs this model can produce either focused or ambient light: 'The light field focusing system adjusts the light spot diameter accurately, assuring an excellent sharpness of details in the operating area,' Acem adds. Ambient light is managed by the Endo function. This technology allows visual comfort as well as a correct vision of

the surrounding environment thanks to its particular light beam coming from the upper part of the lamp. StarLED5 NX is particularly suitable for minimal invasive surgery and is ideal for preparation and treatment during the operation, monitoring the patient and microscope operations.'

A practical and functional design

Acem adds that the model's removable, sterilisable central handle can house a video camera for on demand shooting the surgical operations accurately (the video camera can be placed on a separate arm alternatively). 'The lamp shape assures visual comfort and is particularly suitable for laminar flows in the operating room. All the functions of StarLED5 NX are managed by the handy, digital and easy-to-read I-Sense control panel positioned on the cardanic structure.'

**ACEM is at Medica
Hall 10 / Stand E31**

The sterile single-use

Paediatric cleft palate surgery

DTR Medical, the award-winning British manufacturer of high quality single-use surgical instruments, is demonstrating its new Bone Trepine at Medica this year.

The Bone Trepine is used for bone grafting, including taking circular bone graft biopsies for paediatric cleft palate surgery. The instrument is designed to harvest iliac crest bone

(from the pelvis) for use in alveolar grafting (to add bone to the gum ridge) in children.

'The sterile single-use device has equivalent quality of a reusable instrument, but with the advantage of providing first time sharpness to enable a good harvest to be taken and without the risk of cross contamination,' the company reports.

'Designed for use with a T-bar and Jacob's chuck, the Bone Trepine

**DTR is at Medica
Hall 16 / Stand F42**



has an 8mm internal diameter with a 9mm barrel depth and an overall length of 49mm, and is supplied in a procedure pack with a scalpel to aid bone removal.

'The procedure was reported in the British Journal of Oral and Maxillofacial Surgery and some of the authors have been seeking a sterile single-use alternative for harvesting for some time. As reported use of a Bone Trepine is less traumatic and reduces recovery time compared to other techniques.

'Lead collaborators on the project included Professor Peter Ayliffe

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DUPLEX REAL-TIME PCR KITS

Respiratory infection testing

The Finnish firm LabSystems Diagnostics Oy is demonstrating its Duplex Real-time PCR tests for Chlamydia pneumoniae +

+4C and the kits can be delivered at room temperature.'

LabSystems Diagnostics also reports a successful history in

manufacturing C.pneumoniae, M.pneumoniae, B.pertussis, C.trachomatis and T.gondii IgG, IgM and IgA EIA kits. 'In the point-of-care range of tests, the company has unique products for testing Mycoplasma pneu-

moniae IgM and Chlamydia pneumoniae IgM antibodies from fingertip blood samples,' LabSystems adds.

'Out-of-laboratory use is easy because all accessories are included, and the kits also can be stored at room temperature.'

For the Newborn Screening market, the manufacturer has just launched a tandem mass spectrometry assay kit to expand its neonatal screening products.



LabSystems Diagnostics is at Medica Hall 3 / Stand F44. The Finland Pavilion

Mycoplasma pneumoniae and Bordetella pertussis + b.parapertussis. 'An easy procedure with ready-to-use amplification mix allows simultaneous and separate detection of the two bacteria in a single tube reaction from respiratory samples,' the company reports. 'Internal control is also included to monitor the sample DNA adequacy. The assays are adaptable to most Real-Time PCR instruments with commonly used fluorescence channels. High sensitivity allows detection of as low as 10 copies. Package sizes are 25, 100 and 150 tests/package. Storage is at



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Medical technologies and patents

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When Josef Bille won the European Inventor of the Year Award in 2012, it was for inventing a device that revolutionised certain kinds of eye surgery. His invention received a patent from the European Patent Office, even though medical methods that can be directed to surgery, therapy or diagnosis are explicitly excluded from patentability under the European Patent Convention.



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from Great Ormond Street Hospital and Alistair Cobb from the University of Bristol. Other major centres included Addenbrookes Hospital and University College Hospital London,' DTR points out.

Celebrating a decade in this market, this year, the firm adds that its full range of new products for ENT/MaxFax, General Surgery, Gynaecology, Neurosurgical, Ophthalmic and Orthopaedics is on show here at Medica. Further details: www.dtrmedical.com

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Rudolph is at Medica Hall 16 / Stand D20-15



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