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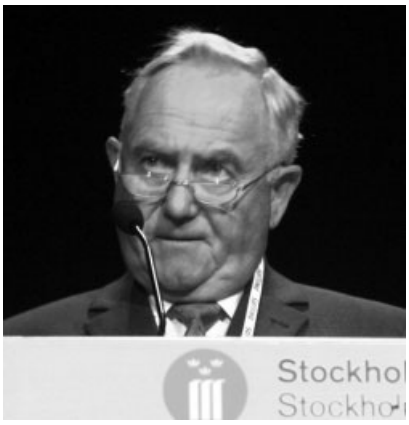
14th World Congress on Ultrasound in Obstetrics and Gynecology, 31 August–4 September, Stockholm, Sweden: presentations and awards

Karel Marsal and Roberto Romero
(Photograph courtesy of Staffan Larsson, Stockholm.)

Ian Donald Gold Medal



Richard Soldner

Presentation of the Ian Donald Gold Medal to Roberto Romero

It is for me a special pleasure and honor to introduce the Ian Donald Gold Medal Winner for 2004. Before I describe his achievements I'd like to tell you the history of this prestigious award and how it is selected. Around 1994 I became concerned that our Society might drift into the usual situation extant in most societies, where decisions on awards are made in smoke-filled rooms with a strong whiff of political compromise and favors for favors. We had already awarded the medal to legends such as Kratochwil and Hansmann but how could we devise a fair and honorable system of deciding who should get the medal? It was then that Karel Marsal who was seconded to the board from the International Perinatal Doppler Society came up with a truly brilliant idea, i.e. that the gold medal winners should vote for the recipient of the award by secret ballot. This meant that there could be no favors for favors for you can only get the medal once and there was a strong incentive for the gold medal committee to make their elite group as prestigious as possible. In other words, only the very best candidates would get the medal.

So who is the 2004 gold medal winner? Well he's male, about 50, aristocratic in demeanour, a cool dresser, good looking in a Yul Brynner kind of way, a Venezuelan who made his career in the United States of America. Yes, you've got it – it is Roberto Romero. Roberto was born in Maracaibo, Venezuela in 1951. He obtained his medical degree *cum laude* in the same city in 1974. His Professor realized his potential and arranged with Professor Nathan Case to take him into Yale University for training and he began his residency in 1976 at the age of 25. In 1980 he began his fellowship in maternal–fetal medicine at Yale under the directorship of John Hobbins whose benign and inspirational leadership ensured that his career would flourish. Almost immediately he was co-author with Nick Kadar of one of the seminal studies of gynecological ultrasound, 'Discriminating hCG zone: its use in the sonographic evaluation for ectopic pregnancy'. Over the next few years Nick and Roberto produced a series of classic studies on defining the ultrasound and biochemical parameters for the early diagnosis of ectopic pregnancy. In 1981 at the age of 31, he was appointed director of perinatal research at Yale University School of Medicine. When you realize that 6 years earlier he was a rookie resident from Venezuela this was an astonishing achievement and a tribute to his intellect and drive. Until 1986, when he became Associate Professor, he, as part of the Hobbins team, produced a series of papers on the ultrasound diagnosis of a variety of congenital abnormalities which included Roberto's four classic papers on renal abnormalities.

After 1986 things began to change. Suddenly his papers were focused on preterm labor and contained terms like cytokines, leukoteines, interleukin 6, prostaglandins, thromboxanes, mycoplasma, ureaplasma and TNF; there were human studies, animal studies and randomized studies on preterm labor, so that within a few years he had convinced us all that subclinical infection was the primary cause of preterm labor and much of infant morbidity. In these few years he had become the acknowledged international expert on all matters concerning preterm labor and one of the most prominent intellectual leaders in modern obstetrics. Also during this time he secured a series of NIH grants for his work on cytokines and preterm labor and then in 1994 he was awarded a large

grant of over $50,000,000 to set up and direct an NIH perinatal research branch at Wayne State University, Detroit, working from Hutzel Hospital. I have noticed that over the past few years his research on preterm labor and pre-eclampsia is becoming more molecular in nature so it is of no surprise that his current title is 'Professor of Molecular Obstetrics and Genetics'. But don't think he has forgotten ultrasound, for Roberto and his team have recently published a series of important papers on 3D/4D ultrasound in the diagnosis of cardiac abnormalities and skeletal abnormalities and dysplasias.

What of the man? He works incredibly hard and expects all members of his team to do the same; he leads by example. He is a profound thinker and has the forensic intellect to analyze and elucidate complex issues. Can I remind you of his devastating rebuttal of the RADIUS study which he presented to our World Congress in Las Vegas in 1993 and subsequently published as an Editorial in our Journal which did much to reverse the anti-ultrasound political climate resulting from the NEJM paper.

Don't be fooled by his aristocratic cool exterior. John Hobbins tells me that Roberto is a fan of Gloria Estefan and when he went with him to one of her concerts in Las Vegas, he actually saw Roberto's foot tapping. My own personal memory is of visiting Roberto in Washington in 1994. He was having a rough time politically as we all have to endure from time to time and I could see the close bond of affection and support from his lovely wife, Ginny. Despite his problems he took the time to show me around Washington before my flight and then drove me to the wrong airport. Most people would just have given up and suggested that I book into a hotel as it was 1 hour to take-off. Not Roberto. He drove the ten miles to the international airport at such a speed that not only did my own life pass before me, but several other lives as well. Needless to say I caught the plane just as the doors were closing. If he needs a second career I suggest Formula 1 driving.

Roberto is in demand by all perinatal societies but I feel he has a natural home in ISUOG. Ultrasound is the most important tool in perinatal medicine. Roberto bridges the gap between ultrasound and the basic sciences, which is very important for our Society. Remember we are not ultrasound technicians, but doctors and scientists who use ultrasound to better understand clinical and genetic problems in our specialty. The Ian Donald Gold Medal is enhanced by this award to Roberto Romero.

S. Campbell
London, UK

Presentation of the Ian Donald Medal for Technical Development to Richard Soldner

Richard Soldner was born in 1935 in Nürnberg, Southern Germany. After leaving primary school, 'young Richard' started his workmen's career with Siemens as a trainee to become a toolmaker. In acknowledgment of an outstanding successful apprenticeship, Siemens Company offered Richard Soldner a scholarship for studying high-frequency engineering at the famous OHM – Polytechnicum in Nürnberg.

After graduating Richard Soldner started, at 25 years of age, his lifetime Job in the Siemens department of Electro Medicine in Erlangen. He started right away with acoustics, ultrasonic therapy and sonar flaw detectors. Siemens was not at that time involved in diagnostic ultrasound although they had already developed ultrasonic flaw detectors in the early 1950s. One of these early systems had already been used in medical applications by Helmut Hertz and Inge Edler in their pioneer work for ultrasound cardiography in 1953 in Sweden, at the University of Lund. Exactly the same system, at the same place, was later used by Leksell in his work for ultrasound echoencephalography.

In 1961 a Japanese paper was published dealing with two-dimensional sonar scans of the female breast, culminating in the statement that this method allows one to distinguish between malignant and benign lesions. This exaggerated message led Siemens Company to construct their own instruments for medical diagnosis. In regard to the investment – Siemens was not a global player in those days – it was very limited, and started as a one-man job – of Richard Soldner. He was asked to modify one of the last existing flaw detectors with the order to develop a scanning device to verify this Japanese statement in larger scale clinical trials. His knowledge about diagnostic ultrasound at this time was more or less zero.

Howry as well as Donald in 1958 used a complex scanning procedure, called compound scanning, to obtain their images. One of the basic requirements for the use of this scanning procedure was that boundaries within the body must be hit almost perpendicularly by the impinging sound pulse in order to receive an echo of sufficient strength. Compound scanning became the state of the art for many years, at least for all their competitors; the Siemens crew felt strong scepticism about this very slow static compound method of producing images. This led to the challenge to produce a machine for rapid imaging. The development of a system which could scan in real time was the targeted intention right from the beginning.

For anatomical reasons a linear scanning mode appeared to be the preferred one, giving a wide field of view from the skin surface, with an image format that was easy to display on the flaw detector's screen because these devices were usually designed for rectangular image formats. On the other hand, to move a transducer across the entire field of view in a rapidly repeated sequence with the intention of constructing a fast scanning system was absolutely out of the question. A transducer assembly rotating at constant speed seemed to be the preferred technical solution. The image format of such a device, however, is a sector whose format is not very useful for the intended application. In order to combine these two contrary conditions to get an optimized scanning

device, Soldner ended up with a very unusual solution. He started his experiments with a 5-MHz transducer mounted on a wheel 30 cm in diameter to create a sector picture in a short time that was fully repeatable. The solution ultimately was the rotating transducer in front of a parabolic mirror, transforming the sector into a parallel scan.

It is well known in optics that a parabolic mirror reflects all rays that emerge from its focal point into rays that are parallel to each other. In other words, such a mirror converts sector scans into linear scans, at least in optics. This law seemed to be transferable to the behavior of ultrasound impulses. Indeed, the combination of a rotating transducer assembly and a parabolic mirror turned out to be feasible and hence the first prototype of the later ''Vidoson'' was manufactured.

In 1963 Soldner started the first clinical trials in the women's hospital of the University at Würzburg. The results of these first trials were quite contradictory. The system fulfilled some technical expectations, but its performance in regard to picture quality was really disappointing. Lateral resolution was very poor and penetration was in many cases not sufficient. Under these circumstances Dr. Soldner came to the decision to build an entirely new prototype with several modifications. These modifications affected all parts of the system, especially the scanner, but also the electronic part and the entire construction. Among other things Soldner replaced the combination of one stationary transducer and rotating mirror by a rotating transducer device equipped with two focusing transducers in front of a stationary parabolic mirror at a frequency of 3 MHz to increase resolution, penetration and frame rate.

After 5 years of hard work in 1965 the Vidoson 635 was ready for clinical applications. Two transducers were mounted on a small wheel – the mirror thus improved was then capable of producing 15 frames per second. The resulting images were displayed on an advanced material-analyzer oscilloscope developed by Krautkraemer – a small company in Cologne – without any need for storage. Real-time ultrasound imaging was born – thanks to the inventiveness of Richard Soldner.

In regard to its usefulness in clinical applications, Hofmann, son of a Siemens director and already advanced in his clinical career, and Hans-Jürgen Holländer, at that time a no-name intern in the department of Obstetrics and Gynecology at the University of Munster, published first in 1966. Above all it is thanks to Hans-Jürgen Holländer and Gerhard Rettenmaier for the success of Soldner's instrument: they increased a hundred-fold the usefulness of ultrasound real-time imaging in medicine. Unfortunately their messages about the advantages in comparison with handheld compound transducers were surprisingly neglected for a long time in the non-German language speaking countries of the western world.

If one compares compound pictures of the leading experts – presented at the 1st World Congress of Ultrasound in Diagnostics of Medicine in 1969 in Vienna, it becomes quite obvious that the Vidoson displays of a 7-week pregnancy were superior to images of all static scanners. From the beginning the Vidoson pictures undoubtedly showed some hint of gray-scaling. Hinselmann, one of the most advanced Vidoson users in Switzerland, characterized real time as an 'utrasonoscopic' diagnosis versus the 'ultrasonography' done by static scanners. The most convincing advantage of real time was the independence of moving structures. In a living patient there are always movements, especially in a fetus. For this reason it was not necessary for me to be clairvoyant to predict in 1974 that in departments of obstetrics and gynecology using diagnostic ultrasound, at least one piece of equipment for echoscopy (real time) would soon have to be present. In regard to the control of fetal dynamics and control of invasive procedures, real time is a precondition. The fetus as a patient was real-time dependent from the beginning.

The Vidoson was the only real-time scanner until 1974, when Advanced Diagnostic Research Corporation (ADR) introduced its linear array system, soon followed by many other companies, most of them introducing small hand-held mechanical sectorscanners. Up to now it is not known by the majority of ultrasound experts that Richard Soldner also developed in 1969 the first linear array of today's design – consisting of 108 small transducer elements in a row, a group of eight neighboring elements being switched electronically across the entire array. Unfortunately this innovation was not supported at that time by Siemens, because the Vidoson was being sold in large numbers, and Siemens held back for ADR's benefit. Handling of these small devices, of course, was much better compared with the old bulky Vidoson system, and the same was true of image quality, because these scanners could be easily optimized for different types of applications. Real-time ultrasound became a commonly used modality.

The Vidoson certainly paved the way; a system that was originally developed just as a prototype to prove the usefulness of real-time ultrasound for a very particular application, was still in use almost 15 years later. In total Siemens has sold more than 3000 of Soldner's Vidoson units – one of the very first has found a place in the German Museum of Science and Technology. I'm happy still to have my Vidoson around. Very recently we plugged it in – and what a surprise, after being off-duty for more than 25 years it successfully passed all tests on a modern phantom – ready to serve for another decade!

Thank you Richard Soldner; on behalf of the ISUOG board and all our distinguished members we thank you for your outstanding contributions in the field of developing ultrasound diagnosis. Your first baby, the Vidoson, was and is an acknowledged milestone in the development of ultrasound imaging. It contributed to the survival and health of thousands of babies. It also contributed to the success of my life!

M. Hansmann
Bonn, Germany

Free communication acknowledgments

The following free communications, presented during the 14th World Congress on Ultrasound in Obstetrics and Gynecology, were each selected as the best presentation in their submission category. Selection was according to a combination of the anonymous peer-review score for abstracts in advance of the congress and the scores for presentation and/or scientific merit allocated on-site by a panel of judges.

Full abstracts to these titles may be found in *Ultrasound Obstet Gynecol* 2004; **24** (3). The authors' valuable contribution to the scientific program is gratefully acknowledged.

Oral communications

The clinical significance of ''sludge'' during transvaginal examination of the cervix in patients with preterm labor. (OC012)
J. Espinoza*, L.F. Gonçalves, Y.M. Kim, T. Chaiworapongsa, J.K. Nien, W. Lee, S. Stites, R. Romero. **Perinatology Research Branch/NICHD/NIH/DHHS, Bethesda, MD and Detroit, MI, USA*

A prospective evaluation of a single visit strategy to manage pregnancies of unknown location (PUL). (OC038)
E. Kirk, G. Condous, A. Khalid*, Z. Haider, C. Lu, T. Bourne. **St George's Hospital, London, UK*

Mild tricuspid regurgitation: a benign fetal finding at various stages of pregnancy. (OC042)
S. Yagel, S. Porat, T. Imbar, D.V. Valsky, Y Sciaky-Tamir, E.Y. Anteby. *Hadassah University Hospital – Mt Scopus, Israel*

Fetal liver volume – relations with placental size and blood flow. (OC054)
G. Haugen*, K. Godfrey, S. Crozier, T. Kiserud, M. Hanson. **Rikshospitalet, University of Oslo, Norway*

Endometrial sampling during sonohysterography and directed biopsy during hysteroscopy for diffuse endometrial lesions: a comparative study. (OC074)
F.P.G. Leone, L. Carsana, C. Lanzani, L. Vago, E. Ferrazzi. *Clinical Sciences Institute L. Sacco, University of Milan, Italy*

Vascular growth and function in late adolescence after intrauterine growth restriction. (OC082)
J. Brodszki*, D. Ley, T. Länne, K. Marsal. **Lund University Hospital, Sweden*

Antenatal assessment of fetal infection with cytomegalovirus. (OC086)
M. Yamamoto*, F. Jacquemard, O. Picone, J.M. Costa, Y. Ville. **CHI Poissy Universite Paris Ouest, France*

Demonstration of endometrial contractions by 3D/4D volume contrast imaging. (OC092)
A. Kratochwil, M. Noe, M. Putzer. *University Hospital Vienna, Austria*

Prenatal diagnosis and obstetric outcomes in triplet pregnancies in relation to chorionicity. (OC104)
A. Geipel*, C. Berg, A. Katalinic, H. Plath, M. Hansmann, U. Germer, U. Gembruch. **University of Bonn, Germany*

Detection of Down's syndrome by routine ultrasound examination at 12–14 vs. at 15–20 gestational weeks. A randomised controlled trial in 40 000 women – preliminary results. (OC110)
S. Saltvedt*, H. Almstrom, M. Kublickas, L. Valentin, C. Grunewald. **Stockholm South General Hospital, Sweden*

2D and 3D pelvic floor ultrasound in the evaluation of suburethral sling implants. (OC136)
H.P. Dietz*, C. Barry, Y. Lim, A. Rane. **Royal Prince Alfred Hospital, Sydney, Australia*

Quantitative description of fetal heart function using tissue Doppler imaging. (OC137)
L.U. Larsen, N. Uldbjerg, E. Sloth, O.B. Petersen, K. Soerensen, K. Norrild. *Aarhus University Hospital, Skejby Hospital, Denmark*

A comparison of ultrasound and magnetic resonance imaging in fetuses with complex anomalies. (OC165)
M. Segata, T. Ghi, G. Pilu, A. Carletti, G. Tani, N. Rizzo. *University of Bologna, Italy*

The aberrant right subclavian artery is a common aortic arch abnormality in fetuses with Down's syndrome. (OC176)
R. Chaoui*, N. Sarioglu, M. Schwabe, K.S. Heling. **Fetal Medicine Unit, Charité University Hospital, Germany*

Ultrasound features of the different histopathological subtypes of borderline ovarian tumors. (OC185)
A.C. Testa*, E. Fruscella, G. Ferrandina, M. Ludovisi, D. Basso, M. Malaggese, G. Corrado, I. Paris, G. Scambia. **Catholic University, Rome, Italy*

Posters

Quantitative assessment of right ventricular function using tissue Doppler imaging in cases of twin to twin transfusion syndrome. (P01.20)
T. Akira*, K. Harada, K. Yasuda, M. Murata, M. Ogawa. **Akita City Hospital, Japan*

Predictive value of middle cerebral artery peak systolic velocity to establish the interval between intrauterine transfusions in fetal red-cell alloimmunization. (P02.03)
B. Muñoz-Abellana, J.E. Sanin-Blair, E. Hernandez-Andrade, J. Lopez, M. Medina, J. Sagala, E. Carreras, L. Cabero. *Hospital Universitari Vall d'Hebron, Spain*

Ultrasonographic prediction of placenta accreta. (P03.21)
J. Baxter*, G. Simonazzi, V. Berghella. **Thomas Jefferson University, USA*

Can serum creatine kinase and CA 125 levels be used to predict the outcome in pregnancies of unknown location? (P04.11)
E. Kirk*, G. Condous, A. Khalid, Z. Haider, N. Rosello, C. Lu, T. Bourne. **St George's Hospital, London, UK*

Correlation between three-dimensional power Doppler sonography of the (sub-)endometrium and angiogenic peptides at the time of oocyte aspiration. (P04.23)
J. Siemer*, C. Dorn, R.L. Schild. **University Hospital Erlangen, Germany*

Longitudinal growth of intracerebral structures assessed by ultrasound; comparison between AGA and IUGR fetuses. (P05.12)
F. Perrotin*, J. Potin, B. Giraudeau, M. Chevillot, P. Arbeille. **Fetal Medicine Unit, University Hospital, Tours, France*

Correlation of preoperative endometrial sampling with pathology in symptomatic and asymptomatic patients with known endometrial polyps. (P06.05)
J. Lerner*, T. Eisenberger, S. Tretyakova.
**Columbia-Presbyterian Medical Center, USA*

Reference ranges for umbilical vein blood flow in the second half of pregnancy based on longitudinal data. (P07.13)
G. Acharya*, T. Wilsgaard, G.K.R. Berntsen, J.M. Maltau, T. Kiserud. **University Hospital of North Norway, Norway*

Diffusion-weighted MRI in the evaluation of placental changes before and after laser coagulation treatment in twin-to-twin transfusion syndrome: preliminary results. (P09.05)
V. Vandecaveye, M. Cannie, F. De Keyzer, L. Lewi, J. Jani, J. Deprest, S. Dymarkowski. *University Hospitals Leuven, Belgium*

Hypoplastic rather than absent nasal bones: a novel phenotypic characteristic of trisomy 21. Description by 3D ultrasound (3DUS) and clinical significance. (P10.23)
L.F. Gonçalves*, J. Espinoza, W. Lee, M.L. Schoen, P. Devers, M. Mazor, T. Chaiworapongsa, G.R. DeVore, R. Romero. **Department of OBGYN, Wayne State University, Detroit, MI, USA*

Double survivors 7 days after laser surgery for twin-to-twin transfusion syndrome: What's next? (P12.20)
R. Robyr, M. Yamamoto, O. Cavicchioni, Y. Ville. *CHI Poissy Universite Paris Ouest, France*

Introital ultrasound of urethra a bladder in patient with iatrogenic outlet obstruction folowing anti-incontinence procedures. (P13.01)
L. Krofta, J. Feyereisl, E. Kasikova, M. Pan. *Institute of the Care for Mother and Child, Czech Republic*

Microbubble contrast-enhanced sonographic depiction of microvessel perfusion in an in vivo animal tumor model: implications for ovarian cancer (P13.12)
K.J. Niermann, T.E. Yankeelov, E.F. Donnelly, D.E. Hallahan, A.C. Fleischer. *Vanderbilt University Medical Center, USA*

Does the obstructive level make differences in their outcomes? A study for pregnancies with fetal GI tract obstruction. (P14.82)
Y.K. Sohn, C.W. Park, S.Y. Oh, S.S. Sim, J.S. Park, J.K. Jun, B.H. Yoon, H.C. Syn. *Seoul National University Hospital, South Korea*

V-Mode vs. B-Mode in the differential diagnosis between cerebellar vermis rotation and Dandy Walker complex. (P15.11)
E. Varvarigos*, M. Iaccarino, S. Iaccarino, R. Russo, R.N. Laurini. **Clinica Mediterranea – Napoli, Italy*