



# EFSUMB History of Ultrasound

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## SPANISH SOCIETY OF ULTRASOUND (SEECO)

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## Introduction

Around the end of the 1960s or early 1970s, ultrasound began to be used in Spain. The first were the neurophysiologists, with the study of the midline echo, and the gynecologists, with the obstetric ultrasound. Bistable equipment was used, with a “yes-no” signal, based on a modifiable threshold and with a real-time study, a sweep was carried out, which, after being interpreted, was eliminated to carry out a new sweep and so on.

At the La Paz Hospital in Madrid, the first ultrasound machine acquired around 1975 was used by cardiologists. Similar ultrasound machines began to be used in the Gynecology Service and the Digestive System Department, at that time directed by Dr. Muro. In the latter, the first works were dedicated to the ultrasound diagnosis of hydatid cysts in the liver. Therefore, cardiologists, gynecologists, and gastroenterologists began to develop the ultrasound technique from a clinical point of view, without even considering the possibility of its centralization.

Towards the end of the 1970s, Dr. José María Segura Cabral made contact with British radiologists, who had begun to use gray scale devices, and began to apply this variant in Gastroenterology. The scans were based on successive cuts, which were not yet interpreted in real time; however, the images already had a remarkable quality, which led Dr. Segura Cabral to publish the book "Abdominal ultrasound", which was the first milestone in the systematization of the ultrasound technique.

Almost simultaneously, the first Digestive Ultrasound Conference was organized, in which series of ultrasound cases were presented that demonstrated the usefulness of the technique in hepatic, biliary and pancreatic exploration. Dr. Teodoro Mayayo Dehesa, from the Urology Service of Hospital La Paz in Madrid, also began to use ultrasound in the exploration of the genito-urinary system.

At the same time, in the United States the concept of imaging techniques emerged (which as such included ultrasound as one of them) and the demand for its centralization and interpretation by a new specific body of specialists, in some way heirs to the traditional radiologists. This gave rise to an enormous controversy between those who had developed ultrasound from a clinical point of view and those who tried to monopolize it as just another imaging technique.

## **Ultrasound training for primary care physicians**

In Spain, this dispute continued for several decades and was reactivated when primary care physicians began to use ultrasound, as other clinical specialties had previously done, and began to organize the first training activities for general and family physicians.

A few months ago, Dr. Solla had begun training in the management of ultrasound with the aforementioned Dr. Muro and later with Dr. Celestino Gómez Gesto, a gastroenterologist from Ourense. Dr. Solla discussed with Dr. Rodríguez Sendín the possibilities that ultrasound offered in terms of increasing the resolution capacity of general practitioners and then they contacted Dr. Eugenio Cerezo López and Dr. Segura Cabral, both Hospital La Paz in Madrid, to begin designing a training proposal aimed at primary care physicians.

It was in 1991 when the first of these courses was launched. Added to the difficulties arising from recruiting students was the lack of availability of ultrasonography equipment and a suitable place to hold them. Several of the professionals who later became benchmarks in clinical ultrasound in Spain participated as students in that first course. The second course, held in 1992, suffered the first external pressures, which led to the abandonment of the project by Dr. Segura Cabral.

The practical contents of the courses had the collaboration of various hospital services in Madrid, which facilitated the students' access to the examinations carried out on their patients. However, on the occasion of the third course, the radiologists managed to block this collaboration. From this moment on, the design of the training included practices with healthy living models and their monitoring by colleagues who had already been trained.

The pressures from the radiologists were increasing; they became threats and finally a complaint before the Central Commission of Ethics of the Collegiate Medical Organization. A disciplinary file was opened to the promoters that took almost four years to resolve. The final opinion of said disciplinary file established that "the borders in the professional practice of medicine only depend on the knowledge and skills of each professional and not on the qualifications that, in his case, can support him."

## **Musculoskeletal Ultrasound**

Through the American Institute of Ultrasound Medicine, contact was made with Drs. Marnix van Holsbeeck and Jose Antonio Bouffard of the Department of Radiology at Henry Ford

Hospital in Detroit, Michigan. They were the promoters of a course on ultrasound of the musculoskeletal system that was held in 1994 in Benalmádemá (Málaga). Several Spanish clinical sonographers attended it. They verified first-hand the advantages that ultrasound provided in this field over magnetic resonance imaging, an imaging technique that was beginning its development at that time.

Musculoskeletal Ultrasound spread rapidly among rheumatologists and other specialists, whose experience developed its applications to unsuspected limits.

### **Ultrasound in rheumatology**

Today, there is no doubt that musculoskeletal ultrasound is the rheumatologist's best tool. It enhances the physical examination, aids in diagnosis and therapy, and is also an attractive research tool. In Spain, rheumatologic ultrasound began in the Spanish Society of Ultrasound (SEECO).

At the time, SEECO President Dr. Eugenio Cerezo predicted that this imaging technique could help rheumatology given the availability of high-frequency linear array probes; It allowed in consultation to visualize and measure synovitis, erosions, tendinitis, tenosynovitis, articular and periarticular crystalline deposits.

In 1996, together with the Spanish Society of Rheumatology, Dr. Bouffard was invited to Spain. For 3 weeks, with great teaching skills, he trained the first group of 20 rheumatologists at the La Paz University Hospital in Madrid.

At the end of the year, the Ultrasound School of the Spanish Society of Rheumatology was founded. A training curriculum was designed that was a pioneer in the EULAR and in the EFSUMB and collaborated in the development of the "Diploma of Competence in Ultrasound in Rheumatology, level 3" of the EFSUMB. He has also recently participated in the first EFSUMB Musculoskeletal Ultrasound Guidelines and Recommendations.

### **Ultrasound in sports medicine**

In the field of Sports Medicine, the objective has always been to reach an exact diagnosis in the shortest possible time in order to establish an immediate treatment that allows shortening the recovery from the injury. The ultrasound technique constitutes a basic pillar in the study of all injuries, which both limit the athlete's performance, especially when it

comes to elite or professional athletes. To do this, ultrasound allows for an evolutionary, rigorous and detailed control of it, since it assesses the day to day of the lesion. This circumstance, when it comes to professional sports, alleviates the pressure that the athlete exerts on the doctor and especially those around him, and helps to know permanently the real situation of the pathological process.

The vertiginous approximation of ultrasound to Sports Medicine and Traumatology has occurred as a consequence of the large number of advantages that this diagnostic technique provides over other study techniques, especially in the assessment of tissues such as muscle, ligament and tendon; Among them, the use of modern portable equipment, which allows this diagnostic technique to be applied in the clinic, the training field and even in the locker room.

In recent years, it has gone through different phases that have allowed us to deepen our knowledge of the pathogenesis of some of the most frequent injuries in sport.

Throughout this development we have to thank the Spanish Society of General and Family Physicians (SEMG) and the Spanish Society of Ultrasound (SEECO) for their commitment and support to make this diagnostic technique available to many health care professionals Sports Medicine and Traumatology in our country, through the different courses taught by a wide range of professors headed in the beginning by the aforementioned Professor Bouffard, from the Henry Ford Hospital (Detroit). Likewise, it is fair to recall the important work carried out by the School of Ultrasound of the Spanish Society of Sports Medicine (SEMED), which in the last 10 years has carried out almost 35 courses at different levels of training, including interventional ultrasound, which served to definitively promote this technique as commonly used in the field of traumatology applied to injuries that affect the soft tissues of the musculoskeletal system. For all these reasons, the ultrasound machine is currently considered the "stethoscope" of the sports doctor.

### **Radial duct ultrasound of the breast**

It is an ultrasound examination model of the breast based on the study following the anatomical pattern of radial arrangement of the lactiferous ducts of the breast, very different from the traditional approach by quadrants through longitudinal and transverse cuts. This technique is capable of locating the origin and extent of breast lesions with greater

accuracy, in addition to identifying certain patterns of their behavior. It has the disadvantage that it requires more time to complete, but its resolution capacity is higher.

The Drs. Michel Teboul and Dominique Amy began its development in France. They were soon joined by a group of enthusiastic Spanish general practitioners, led by Dr. Javier Amorós Oliveros, largely responsible for the current systematization of knowledge using this ultrasonographic technique. In the hands of general practitioners, ductal-radial ultrasound succeeds in mitigating the anguish of patients in benign cases and in adopting decisions whose precocity becomes important when suspicious alterations of malignancy are observed.

## **Skin ultrasound**

Cutaneous ultrasound is the application of ultrasound to the knowledge of the skin, hair and nails. The availability of high-frequency probes (above 15-20 MHz) in conventional equipment makes it possible to perform this type of examination in clinical settings.

The first meeting on skin ultrasound in Spain was held in June 2011 under the auspices of SEECO; as a monographic conference open to the public at the Madrid College of Physicians, it was widely received. On the one hand, Dr. Francisco de Cabo, with his experience in what was initially called "ecoaesthetics" (application of ultrasound to aesthetic medicine), and, on the other, Dr. Fernando Alfageme, with his initial experience in cutaneous tumor pathology, coordinated by the then president of SEECO, Dr. Eugenio Cerezo, showed how to apply ultrasound to the study of the skin.

From that moment, SEECO began its courses and accreditations in this application of ultrasound at two levels. The first accreditation in Dermatology and Aesthetic Medicine took place in February 2016. In 2018, under the auspices of EFSUMB and organized by SEECO, the first European course on cutaneous ultrasound was held with the participation of 70 dermatologists and radiologists from all over Europe.

In 2019, with the endorsement and collaboration of SEECO, the first cutaneous ultrasound course for dermatology residents was organized, recognized by the Academy of Dermatology and Venereology as complementary training in the specialty of medical-surgical Dermatology.

In 2020, the first EFSUMB recommendations on the application of *dermatologic ultrasound* (cutaneous ultrasound) were published, after approval by the Practice Standards Committee of the aforementioned Society.

Cutaneous ultrasound is one of the hallmarks of Spanish ultrasound. It currently enjoys enormous growth and technical and scientific development.

## **Ultrasound in other fields**

Three groups worked in parallel to develop the use of ultrasound in the field of anesthesia and Intensive Care Units. They were those of Dr. Nogué, in Lleida, Dr. Sala, in Barcelona, and Dr. López García, in Madrid.

In the pediatric age, the ultrasound findings are very specific and have required a special systematization, whose precursors were Drs. Stephan Schneider and Inés Osiniri, both in the province of Gerona.

The exploration of the vascular tree has also benefited from the use of ultrasound examination, especially the venous system dependent on the saphenous veins and especially the popliteal ones. Most deep vein thrombosis processes originate from them, which secondarily give rise to pulmonary thromboembolism.

As a branch of urology, andrology has also taken advantage of the possibilities of using ultrasound examination supported by color Doppler, especially in the diagnosis and follow-up of Peyronie's disease and in some types of erectile dysfunction.

## **Ultrasound in primary care of public health services**

Those responsible for the Spanish public health, decentralized in the different regional health services, have been very reluctant for years to incorporate the use of ultrasound as another technique to support diagnosis in their health centers.

Fortunately, at present almost all regional health services have made significant financial investments both for the acquisition and deployment of ultrasound equipment and for the training of primary care physicians. However, it should be noted that the implementation of ultrasound in health centers has not occurred in a parallel or homogeneous way in the different autonomous communities, some of which are very far from having generalized it. Probably, the best development of this implementation has occurred in the Autonomous

Community of Madrid, in which the provision of ultrasound scanners and the training of professionals has been carried out in a period of time that can be considered as exemplary. At this time, the peculiar situation of primary care in Spain is helping to alarmingly reduce the rigor in decision-making regarding the maintenance and encouragement of the use of ultrasound, both in terms of renewing teams as well as actions aimed at the initial and continuing training of family medicine residents and family doctors themselves. The training for the use of the technique entails the learning of theoretical knowledge, but above all the acquisition of manual skills, which can only be achieved from the monitoring of the student by an already expert professional. All this gives ultrasound training a structure that in no case can be ignored, abbreviated or restricted, because otherwise it contributes to giving reasons for criticism by those who still oppose ultrasound examination being in the hands of clinicians.

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