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Spanish Radiology in the second half of the XX Century: A view from inside

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Abstract

Radiology was born in 1896 with the immediate recognition of the diagnostic value of X-rays in medicine and progressed throughout the XX Century with the increasing knowledge of its properties and clinical applications. By mid-century Radiology was a respected clinical specialty in advanced countries, the radiological report was a requirement in hospital practice and radiologists' opinions requested in scientific meetings. In the last decades of the century has had a spectacular expansion with the emergence of new imaging modalities and revolutionary technologies that have transformed the specialty worldwide.

In Spain Radiology lagged behind needs and demand in 1950. Radiological practice was unregulated and performance of X-ray exams by non-radiologists was common. Teaching of Radiology was non-existent in Medical Schools or postgraduation. The diagnostic value of the specialty was unrecognized by physicians and the role of radiologists ignored. Most hospital radiology services were poorly equipped and functionally inadequate. The shadow of the Civil War (1936–39) was conditioning Radiology in the country.

The point of inflection in the development of Radiology in Spain was the inclusion of film reading sessions in the 1965 academic program of the Society of Radiology. It was in the presentation of cases at these conferences that Clinical Radiology found the finest demonstration ground and as a result was immediately adopted by radiologists and progressively applied in scientific meetings, clinical practices and training programs. Its influence was important in reforming hospital practice, legislation on specialization and education, as well as in national health care plans. At the end of the century radiology in Spain was at a par with the standards of other western nations.

The author was a witness of the evolution of Radiology during his 50 years of professional life. This article does not pretend to be exhaustive in names or contributions. It is an overview of the period from the perspective of his past experience and seen from the distance of events that influenced the course of developments. I hope that those interested in the subject find that the effort has been worthwhile and helpful.

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1. Introduction

Nothing can avoid or stop change.

In little more than a century Radiology has grown to become one of the largest and more sophisticated medical specialties in the world. During most of the XX Century progressed with scientific research, technical advances and clinical applications of

conventional X-rays. Particularly in the last decades of the century Radiology had a rapid expansion and transformation with the advent of computed tomography and magnetic resonance and the incorporation of revolutionary technologies.

Radiology has always been my professional world. I earned my Air Force Diploma in 1949 (at the time only the Armed Forces had medical specialization programs in Spain) and I have been a practicing radiologist from then until 2001. In that life span of exactly the second half of the past century I have witnessed the evolution of Spanish radiology, have been involved in important radiological activities at significant times and have served in the board of national and international radiological organizations. From that experience I offer in this article an overview of events, highlighting aspects or key points that I believe help to understand the changes of our specialty in Spain.

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² The actual Spanish Radiological Society is named SERAM, but was SEREM till 1986.

This article is not the history of radiology during that period. Such enterprise exceeds the scope and limits of this issue and, if attempted, would be necessarily incomplete. Parts of that history are well documented in two excellent books of Dr. Carlos Lueje Casanueva, a renowned radiologist and dedicated historian: “History of the Spanish Society of Radiology” (*Historia de la Sociedad Española de Radiología*) [1] and “The Congresses of Radiology in Spain” (*Los Congresos de Radiología en España*) [2]. Precise radiological data of those years is available in Dr. Pilar Gallar’s “Radiology and Thought” (*Radiología y Pensamiento*) [3]. Additional radiological information can be found disseminated in other valuable sources and professional journals. A comprehensive report of recent Radiology however is still waiting for an author.

I use the term Radiology in this article in reference to Diagnostic Radiology only. Radiation therapy, which for a long time shared with Diagnostic Radiology interests and membership in our Radiological Society, is not discussed here. While preparing this work I had to decide quite often whether to include or reject interesting material. For that reason, descriptions are short and the individual names mentioned are restricted to a few of particular relevance. I apologize for the omission of names that deserve recognition but any listing, no matter how long, would be inevitably unjust.

2. Mid-century radiology

In the midst of the century, Radiological Societies in western nations were trying to restore the scientific relations disrupted by World War II. The successful celebration in 1950 of the VI International Congress of Radiology (ICR) in London, announced the continuity of tradition 13 years after the last one in Chicago (1937).

In 1950, Spain faced multiple problems. In addition to the enormous destruction from its Civil War (1936–1939), the country suffered severe shortages and economic difficulties because its isolation and international boycott to its political regime that directly affected radiological practice. In the field of Radiology, foremost among the problems were the existing conditions of education and practice, unchanged since pre-war years, and turf battles within the Society of Radiology (SEREM) to secure positions of control and leadership in the nation.

A brief survey of the epoch and settings may facilitate understanding. It should be remembered that before 1950 radiology was largely practiced in many nations at home offices, sometimes split between the home and hospital. At mid-century few countries had regulated specialization in medicine. Spain had no legal accreditation of radiological specialties. In fact any physician registered at the “College of Physicians” (*Colegio de Médicos*) who acquired an X-ray apparatus was entitled to practice either Diagnostic or Therapeutic Radiology. Many did both. No one should be surprised. In the early 1950s, diagnosis and therapy were included together in teaching programs of the US and European countries as well as in all National and International Congresses.

Before 1950, teaching of Radiology was unsatisfactory or non-existent in many countries. In Spain, none of the Univer-

sities had Radiology Professors and the Medical Schools had never offered teaching to students or graduates. Two Professors of “Physical Therapy” (*Terapéutica Física*) in Madrid and Barcelona taught Radiotherapy. Oddly, they spoke in the name of both Diagnostic and Therapeutic Radiology. And had the upper hand. The lack of opportunities to learn and the delay of much-needed legislation left the practice of radiology in a vacuum, like in earlier days. General physicians and specialists who had not learned the capabilities of radiology for clinical diagnosis ignored radiologists as consultants. They thought and acted as sole interpreters of the radiographs they ordered and many had fluoroscopic or radiographic units in their offices. Diagnostic Radiology did not exist in the nation as a distinct medical specialty.

The damage was particularly evident in hospitals. Few had Central Radiology Departments and free use of X-rays in other areas was common. Radiology Services, empty of file rooms and devoid of the responsibility of reports, were considered factories of radiographs by other physicians. In most university hospitals X-ray units were scattered through services under medical or surgical professors. That is not at all surprising. At the John Hopkins Hospital radiology remained under the surgical service until 1942 [4].

The situation was not accepted by all without fight. In every important city, self-motivated radiologists in pursuit of a different and better radiology did not spare efforts to keep up to date with the progress in radiology and new X-ray procedures. Some reached excellence individually in private offices or hospitals. Dr. J.M^a. Vilaseca is one of the best examples for his many years of teaching at the University Hospital of Barcelona. The XII Seminar of Diagnostic Radiology in 1975 bears his name in his honour. Other professional radiologists enjoyed high reputation though their merits did not have appropriate recognition nationally.

The lack of role and the low prestige were perceived by the radiological community with a sense of frustration and were denounced innumerable times at meetings of the Society of Radiology (SEREM) or in writings [5]. The Society however was powerless to find solutions to issues beyond its reach and had to cope with tensions and inner struggles that eventually provoked, in 1955, the suspension of activities for a long period and threatened the existence of the Society itself.

The country’s isolation gradually disappeared during the decade with the end of the boycott and the subsequent economic recovery had favourable effects on Radiology practices. The Society of Radiology entered a prolonged period of calm in 1957 thanks to the good sense of its members. In those years began the return of physicians after radiological residencies abroad—the initial backflow of foreign trained professionals in the barren post-war period.

3. The sixties: a new radiology

In 1957, Dr. Francisco Campoy started his private practice in Sevilla and at the same time, in parallel, a teaching activity as Radiology Professor at the University Hospital which was for many years of great importance and benefit to innumerable

students and physicians. In 1963, Dr. Cesar S. Pedrosa made a model of his X-ray Service at a new hospital in Oviedo, including film filing, radiologic reports of all exams and the first program for residents in the country. In 1955, I had initiated my practice in two Hospitals of Madrid. Unknown to each other, these radiologists shared the same concept of a clinically oriented Radiology, the appreciation of the high teaching standards in USA and a deep concern for the specialty in Spain.

In 1964, I was invited by Dr. F. Campoy, President of its Scientific Program, to present an innovative Session of film interpretation at the National Congress of Radiology in Sevilla. There was a small audience of two-dozen Radiologists but had a long lasting impact. Diagnosticians were then looking for a different Radiology.

An article by César S. Pedrosa in 1965, "The Respect of the others" (*El respeto de los demás*), analyzed the causes of the low prestige of radiologists and the need to gain the respect of other medical professionals [6]. It received widespread acclaim and rallied radiologists on a national scale in demand of reforms.

With a new Executive Board of the SEREM the 1965 academic year was inaugurated with a film reading session, the first of a program of regular monthly meetings, whose purpose was to provide both a platform and a forum to exercise film interpretation which emphasized clinical features and pathologic findings of each case and was especially designed to encourage participation of attendees [7].

The involvement of those radiologists in the presentation of cases set the pattern of veracity and gave impact to the sessions. The response was prompt and enthusiastic. Radiologists from all of Spain, among them the younger ones from the main Hospitals, gathered every month at the conference hall of the Society with their own hospital cases. The massive attendance was an indication of their need. "Film reading" became the core of the scientific program in 1966 and following years and resulted in more educational meetings. The Society's support enhanced the educational importance of these meetings but also asserted the Society's role as a professional organization in fostering the interests of its members.

A report on Education in Radiology was formally presented at the 1965 Annual Assembly of SEREM and was to serve as a basic document in further planning in 1977 [8]. In 1967 the SEREM programmed the First Seminar of Diagnostic Radiology, a 3-day conference of 10 lectures by expert radiologists with liberal use of radiographs, much like the refresher courses of today [9]. This seminar continued as a series after 1968, held twice each year and centered alternatively on the anatomical or pathological fields of the American College of Radiology (ACR) Index for Roentgen Diagnosis.

In the late sixties, the number of scientific meetings around the country had increased markedly, proving that clinical radiology had been widely accepted. There was also an increased participation of radiologists with training in all scientific areas.

In 1967 the First European Congress of Radiology in Barcelona under the Presidency of Dr. F. Galvez Armengaud registered record attendance. The program of the 1968 National Congress of Zaragoza included a successful film reading session

that was repeated in the 1970 Congress of Santiago and in every National Congress thereafter.

In 1969, my Spanish translation of the ACR Index for Radiological Diagnoses was published under the auspices of SEREM [10] and copies were delivered to radiologists and hospitals upon request. The Spanish edition included a colour code for easy retrieval of case's envelopes from files and was a very useful tool, as it had been in the US, to promote teaching files and to prepare lectures.

An important Symposium was held in 1969 at the University of Valladolid with participation of University Professors, Chiefs of Radiological Services and a few well-known diagnostic radiologists of the country. The title was "Teaching of Roentgen Diagnosis", one of the hottest "turf" matters. The content why, what, who, how and where to teach Diagnostic Radiology [11]. A retrospective study of the program, composition of the panels and opinion of participants would be probably very interesting but irrelevant, since the Symposium did not produce conclusions nor had educational effects. Afterwards, with few exceptions, teaching of Diagnostic Radiology was effective only outside the University.

4. The XIII International Congress of Radiology

In 1969 at the Assembly of the XII International Congress of Radiology (ICR) in Tokyo was accepted the invitation of Spain to host in Madrid the next ICR and the election of Dr. J. Gomez López and Dr. J. Bonmatí as President and Secretary. The choice of Spain was a major challenge to Spanish Radiology and a formidable test for the SEREM considering the Congress needs and requirements: the use of four official languages, an extensive scientific program, a large number of conference halls with facilities for simultaneous translation, large grounds for the Technical Exhibit and an enormous demand for hotel accommodations. The task ahead was predictably huge to achieve success and the greatest possible impact. A National Board of Organization was established early in 1970 and the work began immediately, increasing in volume and complexity during the 4 years of preparation.

The celebration of the XIII ICR in 1973 was a resounding success with record enrolment (nearly 10,000 participants) and its accomplished organization. The credit belongs to the firm commitment of the SEREM, the early planning and widely spread information, the cooperation of industry and, above all, the dedication and hard work of Spanish radiologists with the collaboration of leading radiologists of all nations.

The XIII ICR has been the largest of the International Congresses of Radiology by number of participants and the greatest event of Spanish radiology. Its success left an image of respect in the country and abroad and vindicated Spanish radiologists who gained international presence and self-esteem. The experience gained in its organization was of great help afterward for the sequent International Congresses organizers. The Madrid Congress stands out as a landmark and had multiple effects in Spain, mainly a decisive impact to scientific activity and international relations, a stronger Society and a greater individual involvement of members in projects. And not the least, there

was an unheard economic surplus after closure which opened horizons and possibilities unthinkable before through a Foundation born in 1977. After the Congress, Spanish radiology was no longer the same.

5. The seventies: consolidation and expansion

From a national perspective, the decade of the 1970s appears especially relevant. It is a period of consolidation of Radiology as a clinical specialty as well as of expansion of ultrasound, the radiological subspecialties and computed tomography. The seventies are also the years of opening to world radiology, international relations and fruitful exchanges, invitation of foreign professors into Spain and Spaniards abroad.

But the highlight of the 1970s was the ebullient scientific activity of the radiological community and the evidence that clinical radiology was not just a concept but a national project ahead which was overwhelmingly embraced by diagnosticians. Some examples are: "Radiological Saturdays" (*Sábados Radiológicos*), the massively attended weekly conference at the Hospital Clínico of Madrid since 1970, that replaced the successful monthly meetings of the Society.

The radiological courses and meetings, so numerous in Spain during the decade that enumeration of titles, host cities and invited speakers escapes all possibility of mention. Among the invited speakers were world known Profs. Fraser, Taveras and Felson. The greater participation of radiologists in all Congresses, both National (Tenerife 1974, Oviedo 1976 and Jerez 1978) and European (Amsterdam 1971, Edinburgh 1975, and Hamburg 1979), as well as in scientific reunions or Congresses of other Medical Specialties.

During the 1970s the already prestigious Seminars of the Society were held annually. The SEREM started in 1977 a new Diagnostic series with an International Seminar directed by Prof. Viamonte in Madrid that was held annually afterwards with other professors and equal success in the same city. In the late 1970s, Spanish radiologists began to attend the RSNA Annual Meetings and continued in growing numbers and with scientific contributions during the next decades. The Society started collaboration with the Interamerican College of Radiology and Latin American Club of Radiologists.

By 1974 the SEREM had finished its commitments and international obligations of the XIII ICR. Its membership grew 71% between 1969 and 1974. RADIOLOGIA, the professional Journal of the Society, was upgraded both in scope and content and a periodical "carta circular" (newsletter) kept members informed of the Society's activities.

In 1975, at the "Jornadas Radiológicas" organized by the SEREM all the important issues of Spanish Radiology were openly discussed by members in round tables (specialization in Radiology, Radiology and University, Radiology and Social Security, Radiology and SEREM) and the Society's policies updated.

Radiology and, particularly, the subspecialties Neuro, Pediatric and Interventional Radiology, had a significant growth that began in the late 1960s with the return of foreign trained radiologists who started their careers with active participation

in scientific events. Many of them were heads of Services or excellent teachers shortly thereafter and added competence to practices and forums.

Mammography enjoyed a revival since the mid-1960s, following the research and work of Egan and Gross, with multiple lectures and courses in Spain. Young radiologists attended other courses in Strasbourg with grants of the SEREM. The presentation of the first EMI CT scanner at the RSNA in 1972 opened a new era of imaging and the Spanish professionals seemed prepared for it. The first CT scanner opening was in Madrid by Dr. Hounsfield himself in 1975.

By 1974, a large number of radiologists had been trained in Hospitals of Oviedo (since 1963), Madrid, Barcelona and other cities and the main public Hospitals had Radiological Services or Departments with first rate X-ray installations and clinical radiologists in their staffs.

However, the Universities had not changed. In the seventies there were nearly one-dozen Professors of "Physical Therapy" (*Terapéutica Física*) but none of Diagnostic Radiology. Education and specialization was an issue- and a problem-pressing Government, University and professional Colleges alike. Some of the long expected reforms were approved however during the decade.

A first step forward was the incorporation in 1974 of public hospitals to the educational mission of the University and of radiologists from their staffs as professors of Radiology and Physical Medicine (*Radiología y Medicina Física*). With disregard of that name Diagnostic Radiology was taught in Medical Schools. Years later, in 1983, the Law of University Reform permitted the first Professors of "Radiodiagnóstico" and, in the 1990s, the first Full Professorships with tenure (*Catedráticos*), that is, almost one century after Roentgen's discovery.

Postgraduate medical specialization was regulated by Law in 1978. The requirements for accreditation of the teaching Hospitals and the qualifications of specialists were established by a Council of Medical Specialties. The first program for Radiology was published in 1979.

Afterwards the only way to become a specialist was through residency training in accredited Departments (Residency programs named *MIR* in Spain). Later on, the suppression of the final evaluation of residents at the end of training was a cause, among others, for the uneven results of its implementation in different hospital environments and an impediment to achieve the high training standards and overall quality desired.

6. Fundacion XIII Congreso Internacional de Radiología (XIII International Congress of Radiology foundation)

This Spanish Foundation was born in 1977 with an endowment fund of \$500,000, whose proceeds were specifically assigned to promote Spanish Radiology. The XIII ICR Foundation has sponsored ever since all kind of scientific events in close cooperation with SEREM and has donated funds for important projects that converted the Society into a highly efficient professional organization and owner of its own headquarters with modern facilities that provide up-to-date services to members.

A 1992 summary report of the benefits to Spanish Radiology 15 years after the Foundation's birth is certainly impressive [12].

The Foundation has co-sponsored with the Armed Forces Institute of Radiology (AFIP) an annual course of radiologic–pathologic correlation in Madrid since 1991, the first time held outside Washington. It is a 4-day conference with AFIP Professors and programs, attended year after year by nearly 500 mostly young radiologists. It is now a classic course. Its importance may be better appreciated by realizing that identical courses have been offered since 1995 in Lisbon, Vienna and cities of other countries.

7. Seguro Obligatorio de Enfermedad

The impact and influence of *Seguro Obligatorio de Enfermedad* (SOE) in the evolution of radiology in Spain cannot be overlooked. This National Health Service was started in 1942 to provide medical assistance to low salary workers in the event of disease. The plan was reformed several times through the years, developed into a social security system in 1974 and created INSALUD as a health care service in 1978. It was expanded to cover the entire Spanish population in 1978.

The launching of SOE in the forties shook the social structure of the country and had enormous political and economic repercussions with the introduction of new forms of employment, working conditions and pay systems that affected medical and radiological practices.

The early network of Out Patient Care Centers (*ambulatorios*) of the first years was followed by the opening in the 1950s and 1960s of large hospitals in the main towns and cities. Most of them had modern Radiological Services and first rate equipment, though not all had trained radiologists. Through the years the Hospital's radiological services were improved with renewed installations and qualified specialists. In 1955, SOE created a few scholarships for radiology training but this program was not continued. In the 1960s, the main hospitals of the social security started residency training in diagnostic radiology. One of them, "Clínica Puerta de Hierro", was in the vanguard with innovations in organization and functions. After 1990, the University hospitals were included in the social security network.

8. The last decades: the great expansion of imaging

At the onset of the 1980s Diagnostic Radiology was a recognized and respected medical specialty in Spain with a bright future.

Legal changes in education had eliminated obstacles to needed reforms and as a result Diagnostic Radiology was to be taught in all Medical Schools. The residency programs were an important advance toward a homogeneous and high quality training of residents and would be the only way to obtain the title of specialist in Radiology. Revolutionary imaging technologies had opened new doors to the advance and expansion of the specialty. In Spain, all factors converged to face the future with hope and expectation.

The last two decades were a dynamic period of changes. Ultrasound and computed tomography in the 1980s followed by

magnetic resonance, digital radiography and the development of image-guided interventional procedures in the 1990s marked the course of developments and at the same time set the demands and the needs.

The increasing demand required Radiology Departments to enlarge and to change their structure and function in order to handle the rising volume of imaging. The rapid advance of the new technologies that permit acquisition, storage and transmission of data required specialized manpower to address the increasing complexity and workload and made clear the need for more radiologists and better resident training.

Radiology in Spain evolved during these decades in similar fashion as in other European countries as could not be otherwise. In the age of information the diffusion of knowledge or news of the advances in imaging was homogenous worldwide and in real time. Spain was no different and their well-informed radiologists did the rest responding to the greater workload. They had as always the support of their society.

I shall not try to appraise Spanish Radiology in those years. It is a period too recent and therefore too short of perspective, as well as too vast and complex, to attempt a reliable account of developments in a few pages. Besides it is unnecessary. All about Spanish Radiology of the 1980s and 1990s is easily accessible in professional Journals, on the Internet, and other media. Above everything else I am not a qualified insider.

At the end of the XX Century Radiology or Imaging was a specialty in constant evolution at the forefront of medicine. This was as true in Spain as elsewhere in the world. The challenge of its future is how it will change and where it will go. I have no doubt that Spanish radiologists will contribute with their work, teaching and research to raise the quality of the profession. I regret that I shall not be able to read about the results.

Acknowledgements

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