Araştırma Makalesi – Original Article

Overview of the History of Turkish Radiology in the Light of Archives Documents (1896-1933)*

Arşiv Belgeleri Işığında Türk Radyoloji Tarihine Genel Bakış (1896-1933)

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ABSTRACT

Purpose: To describe the birth of radiology and, its development in the late Ottoman period and during the Republic's early years in Turkiye, and to share information obtained by examining official archive documents.

Method: The study was designed as a document analysis in qualitative research. Publications about the subject were examined, Turkish State Archives were scanned, and documents were analyzed.

Results: Turkiye has introduced X-rays in 1896, thanks to Esad Feyzi. In the 1897 Ottoman-Greek War, X-Rays were used to aid surgery. The first experiment with X-Ray treatment in Turkiye was made in 1899 by Cemil Pasha. In 1902, a radiotherapy unit was established in Istanbul. After the Republic X-Ray machines were purchased for newly established hospitals, and radiology laboratories were established in the country. Developments in the Ottoman period continued.

Conclusion: It is noteworthy that radiology laboratories were established especially in military hospitals during the Ottoman period. The establishment of the Turkish Radiology Association in the early years of the Republic, the procurement of devices from abroad for both existing hospitals and newly established hospitals, and the employment of specialists in hospitals show us that the importance of radiology was understood. To be able to continue successfully Turkiye's radiology adventure beginning in 1896, it is very important to emphasize education as it is before and maybe more, to train qualified manpower, to employ them in the right places, to follow the developments in the world, and to have centers with modern equipment.

Keywords: Ottoman Empire, Turkish Republic, X-Ray, History of radiology.

ÖZ

Amaç: Türkiye'de radyolojinin doğuşunu, Osmanlı'nın son dönemi ve Cumhuriyet'in ilk yıllarındaki gelişimini anlatmak ve resmi arşiv belgelerini inceleyerek elde edilen bilgileri paylaşmaktır.

Yöntem: Çalışma nitel araştırmada doküman analizi şeklinde tasarlanmıştır. Konu ile ilgili yayınlar incelendi. Devlet Arşivleri taranarak bulunan belgeler analiz edildi.

Bulgular: Türkiye 1896 yılında Esad Feyzi sayesinde X-Işınları ile tanıştı. 1897 Osmanlı-Yunan Savaşı'nda X-Işınları cerrahiye yardımcı olmak için kullanıldı. Türkiye'de XIşını tedavisi ile ilgili ilk deneme 1899 yılında Cemil Paşa tarafından yapıldı. 1902 yılında İstanbul'da bir radyoterapi ünitesi kuruldu. Cumhuriyetten sonra yeni kurulan hastanelere X-Işını cihazları satın alındı. Ülkede çeşitli illerde radyoloji laboratuvarları kuruldu. Osmanlı dönemindeki gelişmeler devam ettirildi.

Sonuç: Osmanlı döneminde özellikle askeri hastanelerde radyoloji laboratuvarlarının kurulması dikkat çekicidir. Cumhuriyet'in ilk yıllarında Türk Radyoloji Derneğinin kurulması, hem mevcut hastaneler hem de yeni kurulan hastaneler için yurt dışından cihaz tedarik edilmesi ve hastanelerde uzman isimlerin istihdam edilmesi radyolojinin öneminin anlaşıldığını bizlere göstermektedir. Türkiye'nin 1896'da başlayan radyoloji serüvenini başarıyla sürdürebilmek için eskiden olduğu gibi ve belki de daha fazla eğitime önem vermek, nitelikli insan gücü yetiştirmek, bunları doğru yerlerde istihdam etmek, dünyadaki gelişmeleri takip etmek ve modern donanıma sahip merkezlere sahip olmak çok önemlidir.

Anahtar kelimeler: Osmanlı İmparatorluğu, Türkiye Cumhuriyeti, X-Işını, Radyoloji tarihi.

Mersin Üniversitesi Tıp Fakültesi Lokman Hekim Tıp Tarihi ve Folklorik Tıp Dergisi, 2023;13(2):303-313
DOI: 10.31020/mutftd.1238285
e-ISSN: 1309-8004
Geliş Tarihi – Received: 18 January 2023; Kabul Tarihi - Accepted: 04 May 2023
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Introduction

With the discovery of X-Ray in Würzburg, Germany on 8 November 1895 by the German scientist Wilhelm Konrad Röntgen, a new leaf was turned over in the history of world medicine.[1] In fact before Röntgen, American physicist Arthur Goodspeed and photographer William Jennings discovered the X-Ray in 1890. But they could not understand what happened.[2] And they missed the opportunity to have their names written in gold letters in the history of medicine.[3]

A year after Röntgen, French Antoine Henri Becquerel discovered that uranium salts emitted radiation similar to X-Rays.[4] In 1898, after their hard work, Marie and Pierre Curie couple found the radioactive elements they named polonium and radium which were a milestone in radioactivity.[5] Shortly after that, Frenchman Paul Ulrich Villard showed that the rays emanating from radium were photon rays with the same properties as X-Rays.[4] The full understanding of radioactivity was only possible when Scottish-New Zealander Ernest Rutherford and his students discovered the atomic nucleus in 1911, artificial radioactivity in 1919, and the neutron in 1932.[6]

The discovery of X-Ray and radioactivity, radiography and radiotherapy, that is, imaging of the internal structure of living things for medical purposes, and the treatment of sick people by radiation therapy has played a quite critical role in the advancement of medicine, development of medical technologies and reaching present level.

In this study, the development of radiology in Turkiye in the late Ottoman period and the early years of the Republic was tried to be explained by utilizing archival documents.

Method

The study was designed as a document analysis in qualitative research.[7] Publications such as books and articles on the birth of radiology were examined and these were utilized in the study.

Term publications and the catalogs of the Ottoman and Republican Archives of the Presidency of the Republic of Turkiye Directorate of State Archives were scanned. The words "radiology", "röntgen", "rontgen", "X-Isini", "X-Ray", "radiolog", "radyolog", "radiologist", "radiation" and "physician" were used as keywords in the searches.

Publications on the period, and the ten original documents on the subject shown in ***Table 1*** in the Catalogue of the Republican Archives were analyzed and used in the study.

Table 1. Archive documents utilized in the study.

Date	Document content	Fond	Box- Folder-Sequence
25.06.1924	Purchase of X-Ray machines required for Ankara, Sivas, Diyarbakir and Erzurum Hospitals from Fayfa Verke Factory by negotiation.	30-18-1-1	10-31-17
25.06.1924	Granting 1200 Liras for the expenses of Dr. Fevzi to be sent to Germany for four X-Ray machines to be purchased from the Fayfa Verke Factory by negotiation.	30-18-1-1	10-31-18
19.10.1924	Purchase of the X-Ray equipment required for Istanbul Gureba-yi Muslimin Hospital from Siemens Factory in Germany.	30-18-1-1	11-49-2
19.10.1924	Allocation of salary to Dr. İbrahim Vasif, X-Ray specialist at Istanbul Gureba-yi Muslimin Hospital, from the Service to the Homeland order.	30-18-1-1	11-49-11
27.04.1929	Granting Turkish citizenship to Franz Burchard George Dycke of German nationality, former chief physician of Gulhane Hospital.	30-18-1-2	3-24-12
14.05.1930	Purchase of two X-Ray machines for the fight against tuberculosis.	30-18-1-2	11-34-11
03.09.1930	Purchase of stereoradiography equipment for Istanbul Haseki Women's Hospital X-Ray Laboratory.	30-18-1-2	13-59-17
08.10.1930	Purchase of X-Ray equipment required for Manisa Memleket Hospital.	30-18-1-2	14-64-13
08.04.1931	8th Corps' Sivas Hospital X-Ray Department to be built on entrustment.	30-18-1-2	19-26-13
18.12.1932	Purchase of a set of X-Ray equipment for Aydin Memleket Hospital.	30-18-1-2	32 -75-20

The study was conducted between February 2021 and November 2022 and does not require ethics committee approval in terms of its content.

In the study, the comparison of the findings with the historical literature is given in the same place and the discussion is made in line with the results.

Results

Radiology in the Last Ottoman Period in Turkiye

Turkiye indubitably was affected by developments all over the world in the field of radiology that occurred at the end of the 19th century and the beginning of the 20th century. Esad Feyzi (1874-1901), a fifth-year student of the Military Medical School, shortly after the discovery of the X-Ray, was highly influenced by what was described in Prof. C. M. Garièl's article "Les Recherches du Prof. Roentgen et la photographie à travers Les corps opaques" which was published in the newspaper “La Semaine Médicale”. He was able to produce X-Rays with the machine he had manufactured after a few days of hard work in School laboratories.[8]

The first radiography obtained belonged to Akil Muhtar (Ozden), two classes below Esad Feyzi.[9] After this first lucrative study, Esad Feyzi and his schoolmate Rifat Osman (Tosyali) obtained radiographs of objects such as fingers, arms, money bags, and coins.[10]

Galatasaray High School mathematics teacher French Monsieur Isoard and photographer Halit Bey should also be mentioned when portraying the first experiments and studies conducted in Turkiye about X-Rays, which were met with great interest all over the world. Monsieur Isoard had succeeded in obtaining a graph of coins and his son's hand, and Halit Bey a graph of a pencil. [11]

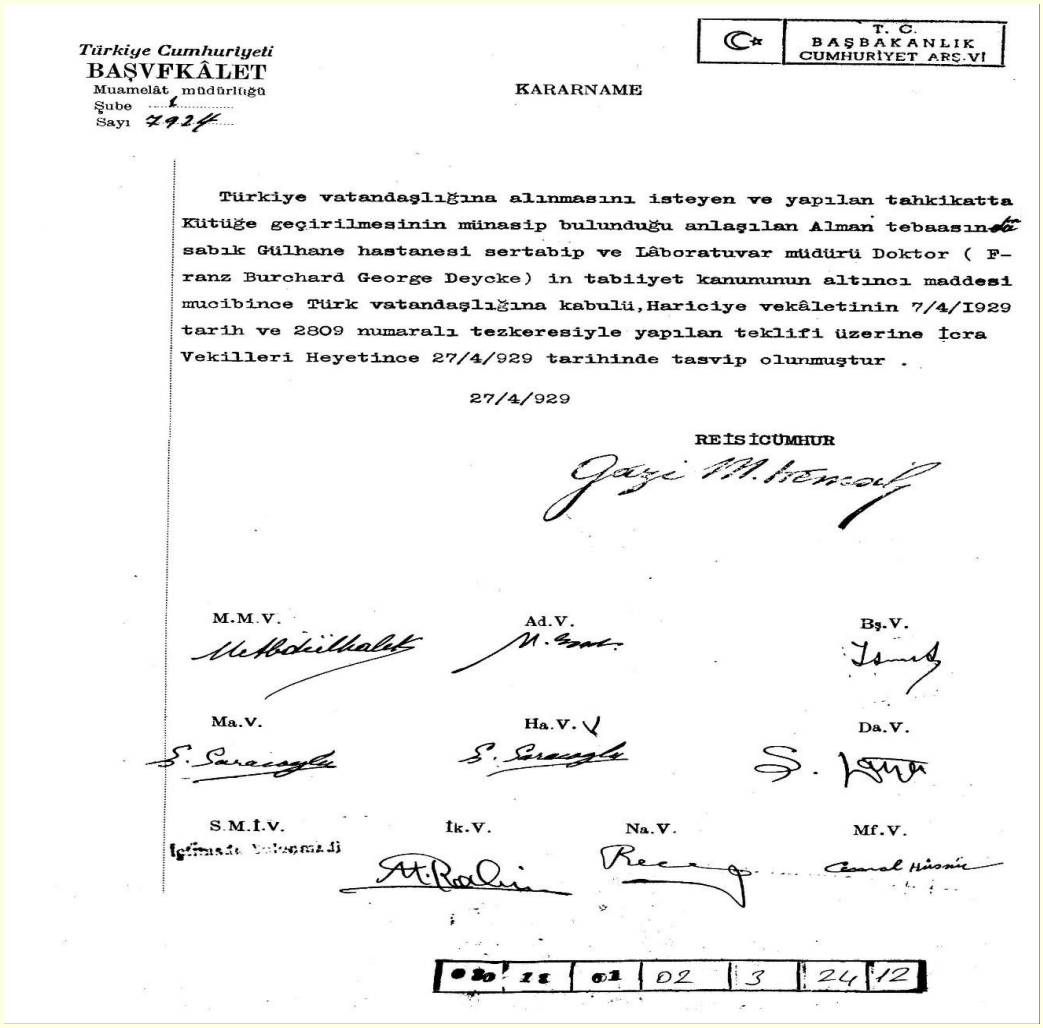
Meanwhile, the idea of using X-Rays in war surgery emerged in the world. Dr. Guiseppe Alvaro took graphs of the injured Italian soldiers in May 1896 during the war that Italy started to colonize Ethiopia, and according to the results he obtained, he managed to surgically remove a few pieces of lead. In the same year, the British Army began training X-Rays at Victoria Hospital, and the world's first radiographers graduated from there on November.[12]

During the Ottoman-Greek War (1897), Esad Feyzi and Rifat Osman to detect shrapnel and bullet fragments in the bodies of wounded soldiers and thus facilitate surgical interventions, presented the issue of transporting the X-Ray machine in Medical School to Yildiz Military Hospital to Chief Physician Cemil (Topuzlu) Pasha. Cemil Pasha welcomed this idea very positively, and the machine was moved to Yildiz Hospital with the approval of Zeki Pasha, who is in charge of military schools, and Sultan Abdulhamit II. Thus, since Esad Feyzi and Rifat Osman were still students, they were able to start hospital radiology practices under the supervision of Dr. Salih.[13]

First off, a hand graph of Boyabatli Mehmet, one of the wounded soldiers, was taken and a detected piece of shrapnel was surgically removed by Cemil Pasha.[14] The developments regarding this process, which continued afterward, were published in “Servet-i Funun Magazine” and “Gazette Médicale d'Orient” in Istanbul.[12] These practices attracted the attention of the “German Red Cross Delegation” visiting Yildiz Hospital. German physicians, who took part in this delegation, installed an X-Ray machine, a second machine in Turkiye, they brought from Germany to the hospital with permission they had received and took part in diagnostic activities with X-Rays. Dr. Hermann Küttner published his work in 1898 as an article.[13] These studies are quite crucial in terms of the pioneering use of X-Rays during the war.[15] On the opposite side of the Ottoman-Greek War, Dr. Francis C. Abbott, the head of the British Health team working in Athens, also benefited from X-Rays for similar purposes and published his work as an article after the war.[12]

Esad Feyzi, in 1897, at the age of 23, graduated from Medical School with the rank of captain; and, with the initiatives of his teachers Dr. Esad (Isik) Pasha and Ismail Ali Bey, stayed in Istanbul instead of going to Yemen, where he was first appointed.[12] Thus, Dr. Esad Feyzi, who attended the classes as a lecturer, had the opportunity to continue his radiology studies. He ensured that radiology was included in the medical education curriculum and a radiology branch was opened under the surgical clinic.[16] He completed the book "X-Rays and Medical and Surgical Applications", which was the first radiology book in Turkiye, and one of the leading radiology books in the world in 1898. His article on "X-Ray, Its Nature, and Medical Applications", in which he describes how X-Rays are obtained, their properties, and their use in the diagnosis, was published in "Nevsal-i Afiyet" in 1899.[16] He passed away at the age of 27 because of his illness turning into meningitis.[17]

An important development had taken place in Turkish medicine and radiology in 1898. Gulhane Military Hospital was opened on December 30th with the efforts of Dr. Robert Rieder (Brigadier General in Turkiye) and his assistant Dr. Franz Burchard Georg Deycke (Colonel in Turkiye), who were invited from Germany and signed a contract with to administer the Medical School, curriculum renewal, and the establishment of a training hospital. Dr. Rieder was a surgical specialist, and Dr. Dycke was a radiologist.[18] Particular attention was paid to making Gulhane Hospital an exemplary hospital at the level of the best hospitals in Germany.[14] The third X-Ray machine in Turkiye, was used here in this hospital under the supervision of Dr. Deycke and Dr. Rifat Osman. Both Rieder and Deycke made great contributions to medicine in Turkiye. These physicians' ties with Turkiye continued throughout their lives, even radiologist Dr. Deycke requested Turkish citizenship and this request was approved by Decree numbered 1/7924, dated 27 April 1929, as shown in ***Figure 1***.[19]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KARARNAME

Türkiye vatandaşlığına alınmasını isteyen ve yapılan tahkikatta Kütüğe geçirilmesinin münasip bulunduğu anlaşılan Alman tebaasından sabık Gülhane hastanesi sertabip ve Lâboratuvar müdürü Doktor (Franz Burchard George Deycke) in tabiiyet kanununun altıncı maddesi mucibince Türk vatandaşlığına kabulü, Hariciye vekâletinin 7/4/1929 tarih ve 2809 numaralı tezkeresiyle yapılan teklifi üzerine İcra Vekilleri Heyetince 27/4/929 tarihinde tasvip olunmuştur .

27/4/929

REİSİCUMHUR

M.M.V. Ad.V. Bş.V.

Ma.V. Ha.V. Da.V.

S.M.İ.V. İk.V. Na.V. Mf.V.

Figure 1. Archive document (Decree on Dycke's acceptance of Turkish citizenship)[19]

After seeing the benefits of these first X-Ray machines in Military Medical School, Yildiz and Gulhane Hospitals; new machines were supplied to Ankara Cebeci, Edirne, Haydarpasa, and Thessaloniki Military Hospitals, and Bakirkoy Emraz-i Akliye, Aksaray Haseki, Topkapi Bezm-i Alem Vakif Gureba, Sisli Hamidiye Etfal Hospitals and, radiology laboratories were established.[20]

Again, besides the aforementioned physicians, in the following years, Asaf Dervis, Rasit Tahsin, İbrahim Vasif, Suphi Neset, Ibrahim Etem, Rasih Emin, Suffian, Sukru Dervis, Sukru (Cangor), Akil Muhtar (Ozden), Mim Kemal (Oke), Izzet (Taner), Kazim (Icgoren), Huseyin (Baydur), Kamil (Goren) and Mrs. Saadet (Goren) were other physicians who worked in these laboratories.[20]

Here, we realize that Mrs. Saadet should be mentioned separately. Just like her husband Mr. Kamil, Mrs. Saadet is devoted to radiology, and she is Turkiye's first female radiologist according to the sources examined. Mrs. Saadet graduated from the Medical School in 1929 and became an assistant in 1930, and after two years of assistantship, she became the chief assistant.[21]

Physicists working in the first radiology laboratories in Turkiye are Antranik Pasha, Ismail Ali, Sevki, and Vasif Bey. Ali Riza and Vasil Nahum, on the other hand, are the first chemists working in this field.[20]

X-Rays began to be tried in the treatment of cancer diseases at the end of the 19th century and the beginning of the 20th century, thus a new method, radiotherapy, emerged in the treatment of these diseases. In Turkiye, the first treatment trials with X-Rays were conducted by Cemil Pasha in Medical School in 1899. By 1902, a laboratory was established for this field at Sisli Hamidiye Etfal Hospital. Rasih Emin, Suffian, Ibrahim Vasif, and Sevki benefited from X-Rays both for diagnosis and treatment.[20] The electricity of the hospital was obtained from a gasoline generator.[21]

The fact that the X-Ray was used for treatment purposes after the use of diagnostic purposes in Turkiye synchronously with the world, showed how important it was to establish radiology laboratories and to train the physicians, chemists, and physicists who would work there.

It was thought that it would be important to allocate a separate place for Dr. Ibrahim Vasif here. As a physician, İbrahim Vasif not only dealt with radiology but also took care of other medical devices, repaired broken equipment, and ensured their maintenance.[22] During the Balkan Wars (1912-1913), he suffered radio dermatitis due to the ionizing radiation emitted by X-Ray tubes, which did not have any protection. Consequently, he lost his right hand and the fingers of his left hand. Even in this situation, he did not hesitate to take care of the sick and the wounded and showed a true example of sacrifice.[23] Later, with a Decree dated October 19, 1924, Ibrahim Vasif, whose services were appreciated, was given a "Service to the Homeland" salary.[24]

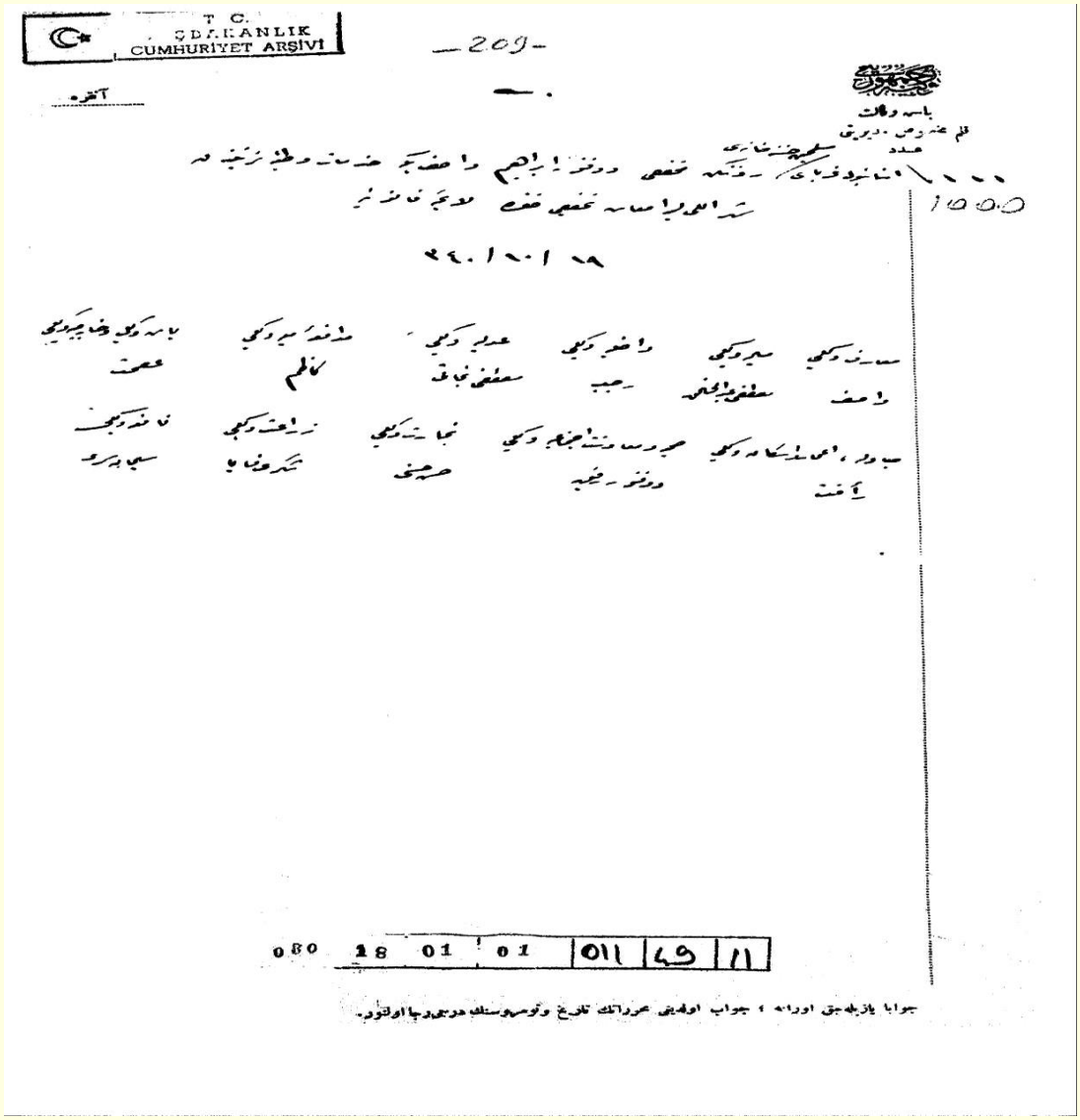


Figure 2. Archive document (about the Service Homeland Salary of Dr. Ibrahim Vasif)[24]

The archive document on this subject is given in ***Figure 2.*** Ibrahim Vasif died on February 21, 1926, due to the flu he caught two years later and subsequent pleurisy. İbrahim Vasif lies in Edirnekapi Martyrdom.[23]

The interest and the efforts in education and radiology which emerged as a new field of science are extremely important in a period when that brilliant period of the Ottoman Empire was left behind, the state and the nation were exhausted because of the repeatedly coming battles and defeats; all of which ensured that solid foundations are laid in Turkiye and provided continuous developments in the field of radiology.

Radiology in the Early Years of the Republic in Turkiye

In the field of radiology, shortly after the proclamation of the Republic, the first radiology professional organization was founded in Turkiye and began to benefit from the blessings of this science simultaneously with the world. Today's “Turkish Radiology Association” was established in Istanbul in 1924 under the name of the "Turkish Electrophysiology Society". The foundation purpose of the association is explained in the second article of the Association's Statute as; “Following the progress and evolution of the medical practice of Radiology and its development in our country, and service and assistance to meet the common needs of the strengthening of personal, professional and scientific cohesion and loyalty among radiology followers". Medical School X-Ray instructor-physics professor Mehmet Sevki, Medical School Radiology Specialist

Selahattin Mehmet (Erk), Suphi Neset (Beken) from Haseki Hospital Radiology Service, Burhanettin (Toker), Demetrius Chiladiti, Zakar (Tarver) and Gulhane Hospital Radiology Specialist Sükrü Emin are the founding members of the association.[25]

In the first years of the Republic, one of the most important tasks of the Ministry of Health must try to meet the increasing need for X-Ray machines as the number of health institutions increased. In this context, X-Ray machines were supplied and put into use for the needs of hospitals. From an archive document dated June 25, 1924, that we examined; it is understood that it was decided to buy the X-Ray machines required for Ankara, Sivas, Diyarbakir, and Erzurum hospitals from the Fayfa Verke Factory.[26] For this duty, by Government Decree, Dr. Fevzi was sent to Germany as an officer and he was given an allowance of 1200 Liras for his expenses.[27] According to another Decree dated 19 October 1924 (***Figure 3***), it was decided to purchase the X-Ray machine required for the Istanbul Gureba-yi Muslimin Hospital from Germany, but this time from Siemens Factory.[28]

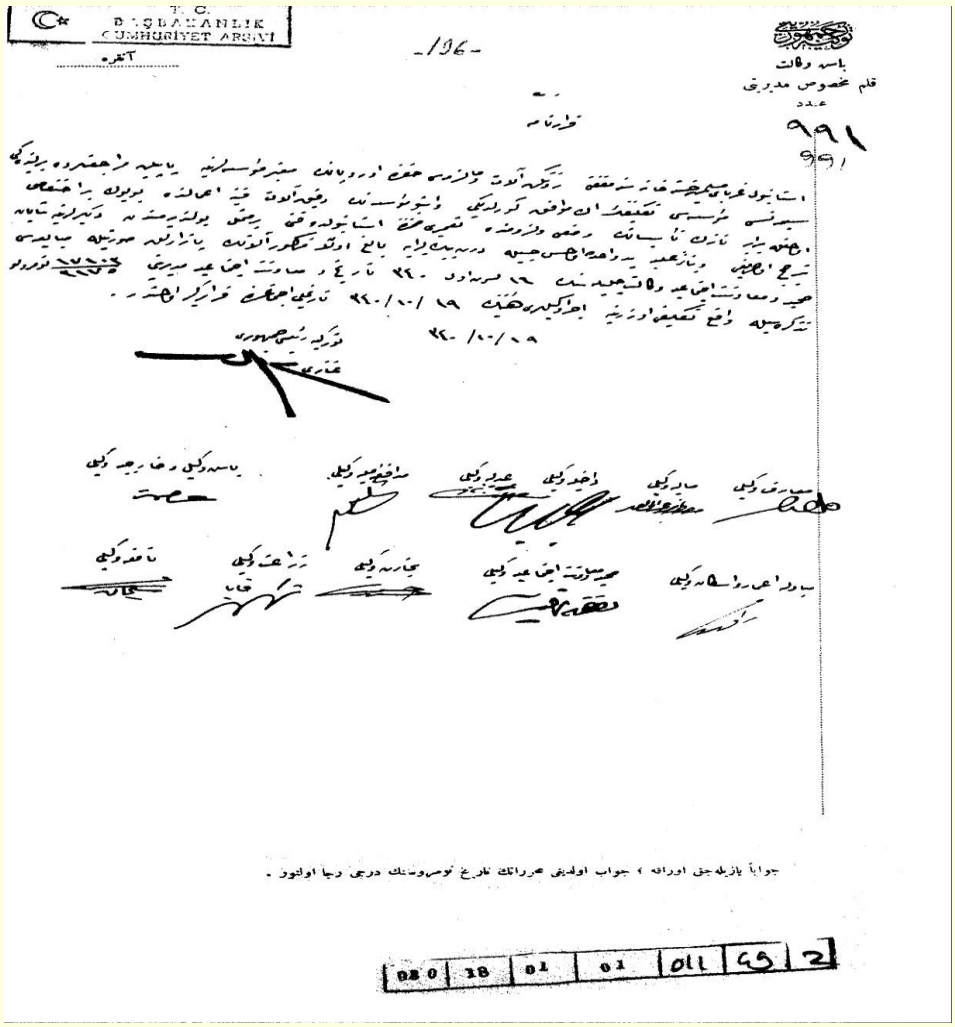
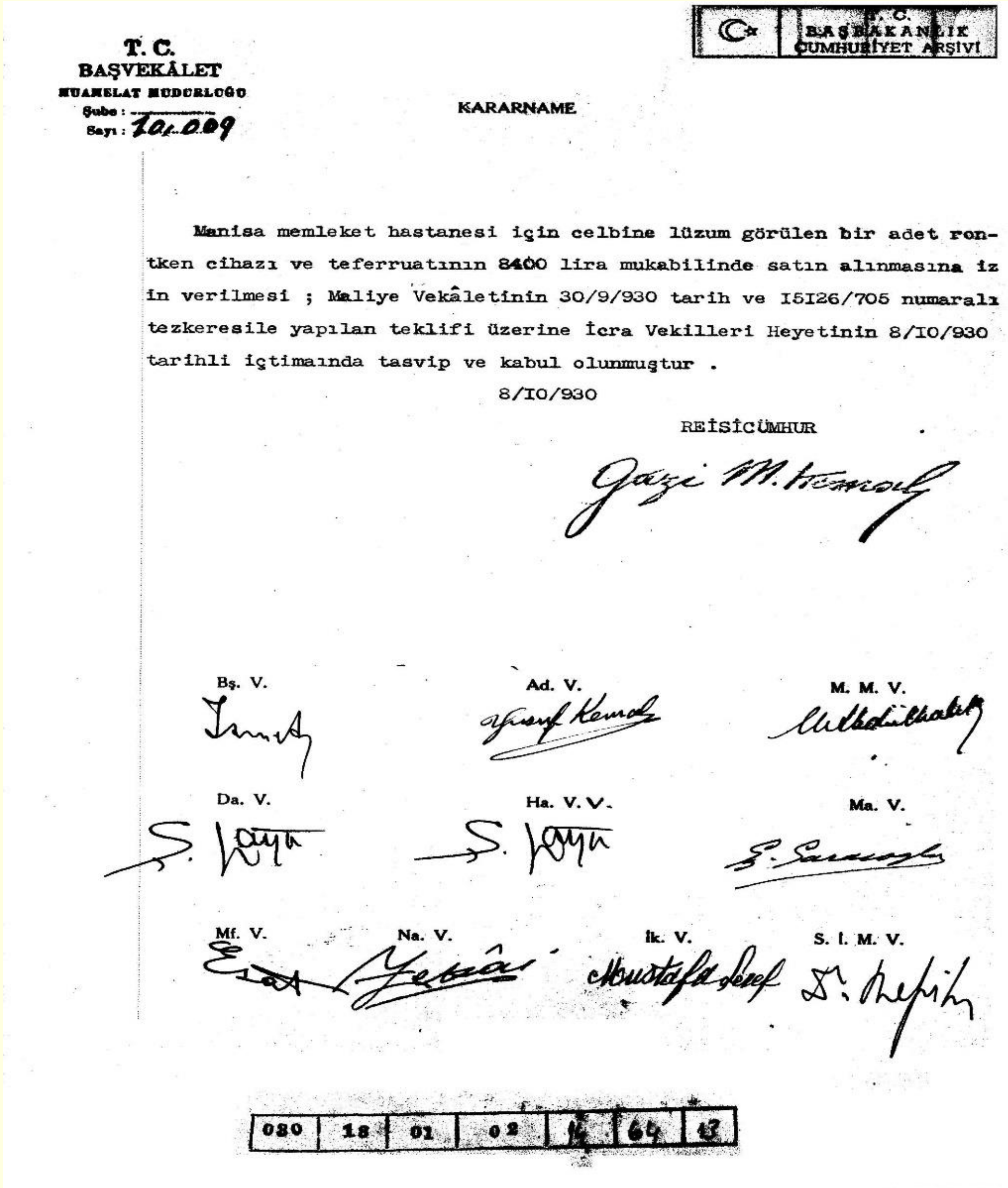


Figure 3. Archive document about the purchase of an X-Ray machine for Istanbul Gureba-yi Muslimin Hospital[28]

It was understood from Decree dated 14 May 1930 that it was decided to purchase two X-Ray machines to be used in the fight against tuberculosis. 11180 Liras was allocated for this purchase.[29] On September 3, 1930, it was decided to purchase the equipment (stereoradiography) needed by Istanbul Haseki Women's Hospital X-Ray Laboratory.[30] With a Decree dated 8 October 1930 (***Figure 4***), it was approved to receive an X-Ray machine and its accessories required for the Manisa Memleket Hospital. 8400 Liras was allocated for this purchase.[31]



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KARARNAME

Manisa memleket hastanesi için celbine lüzum görülen bir adet rontken cihazı ve teferruatının 8400 lira mukabilinde satın alınmasına izin verilmesi ; Maliye Vekâletinin 30/9/930 tarih ve I5I26/705 numaralı tezkeresile yapılan teklifi üzerine İcra Vekilleri Heyetinin 8/I0/930 tarihli içtimaında tasvip ve kabul olunmuştur .

8/I0/930

REİSİCUMHUR

Gazi M. Kemal

Bş. V. Ad. V. M. M. V.

Da. V. Ha. V. V. Ma. V.

Mf. V. Na. V. İk. V. S. İ. M. V.

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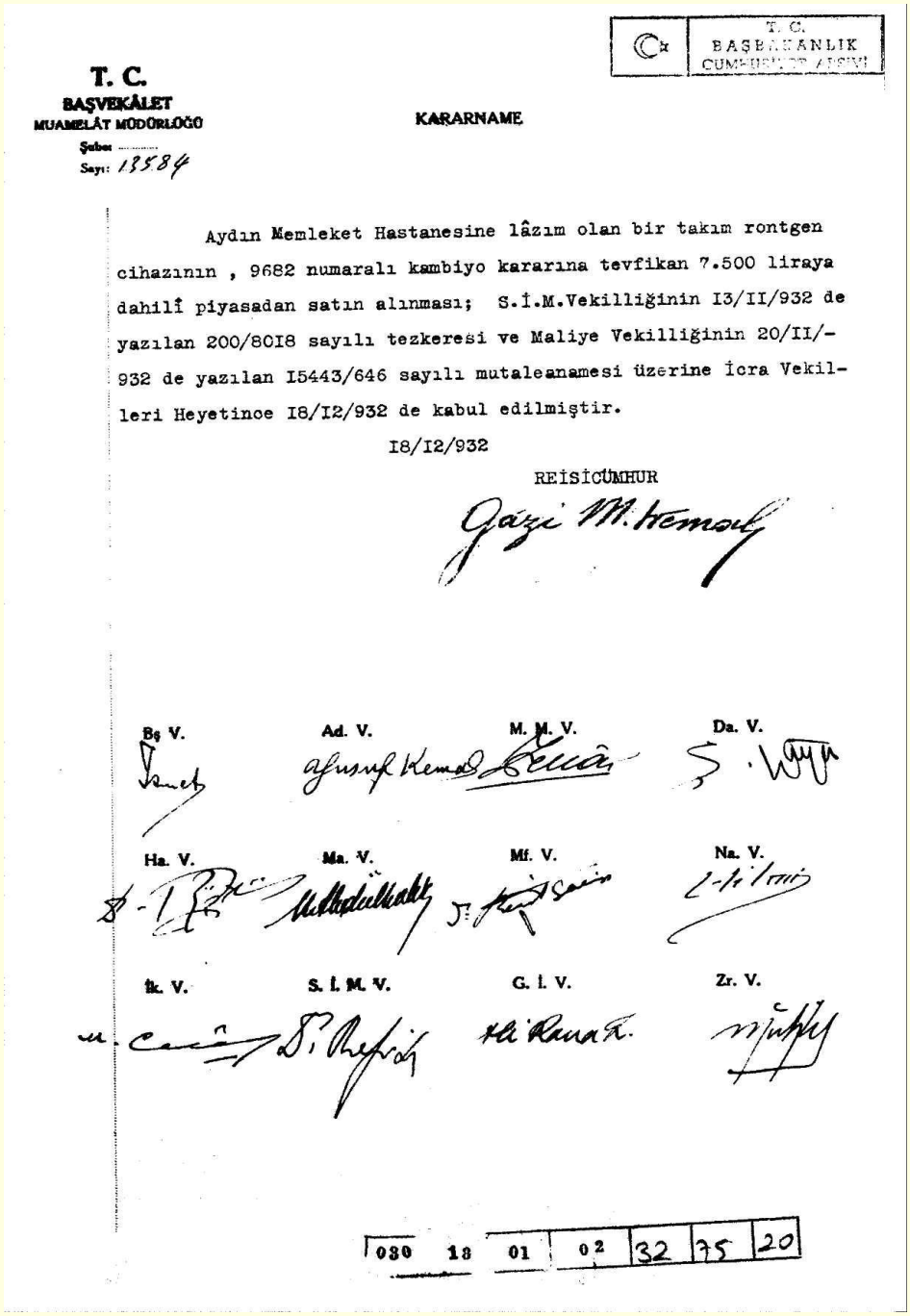
Figure 4. Archive document about the purchase of an X-Ray machine for Manisa Memleket Hospital[31]

Since it was not possible to have the X-Ray department of Sivas Military Hospital done neither by tender nor by bargaining, it was decided on April 8, 1931, that this work should be done by consignment by Law No. 878.[32] On 18 December 1932, it was decided to purchase an X-Ray machine for 7500 Liras for Aydin Memleket Hospital.[33] The archive document on this subject is given in ***Figure 5***.



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KARARNAME

Aydın Memleket Hastanesine lâzım olan bir takım rontgen cihazının , 9682 numaralı kambiyo kararına tevfikan 7.500 liraya dahilî piyasadan satın alınması; S.İ.M.Vekilliğinin I3/II/932 de yazılan 200/80I8 sayılı tezkeresi ve Maliye Vekilliğinin 20/II/-932 de yazılan I5443/646 sayılı mutaleanamesi üzerine İcra Vekilleri Heyetince I8/I2/932 de kabul edilmiştir.

I8/I2/932

REİSİCÜMHUR

Gazi M. Kemal

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Ha. V. Ma. V. Mf. V. Na. V.

İk. V. S. İ. M. V. G. İ. V. Zr. V.

030 18 01 02 32 75 20

Figure 5. Archive document about the purchase of an X-Ray machine for Aydin Memleket Hospital[33]

Information regarding the newly acquired X-Ray equipment in the first years of the Republic is like this. If we look at radiologists; it is seen that Orhan (Kazancigil) worked in Cerrahpasa, Fevzi (Isikman) in Ankara Numune, and Ekrem and Muhterem in Sivas Numune hospital. Osman Saib, Tarik (Temel), Osman Fethi, and Naci worked in Erzurum Numune, Sezai, Nurettin, and Halit in Diyarbakır Numune and Selahattin Mehmet (Erk) in Haydarpasa Numune Hospitals.[20]

Of course, it was not possible to overcome the difficulties immediately, to assign a new staff to a vacant staff immediately, to replace the devices that were difficult to use or defective in a short time. However, in the last period of the Ottoman Empire, successful activities in the field of radiology increased and continued.[34]

Discussion

Turkiye's radiology adventure began in 1896, shortly after Röntgen discovered the X-Rays have reached today continuing progress in both diagnostic and therapeutic fields. Radiology, radiation oncology, and nuclear medicine departments of medical faculties are the representatives of this adventure today.

The first Military medical school began in Turkiye, the process of obtaining the X-Rays and graphs then was passed into the process of doing surgery in 1897 the Ottoman-Greek War by utilizing X-Rays and graphs. At the end of the 19th century and the beginning of the 20th century, X-Rays were also used this time for therapeutic purposes.

In the last period of the Ottoman Empire, expands in fields such as radiology and radiotherapy continued in the Republic period, and new devices were purchased for both the hospitals' needs and to combat tuberculosis. Radiologists were employed in both old hospitals and newly opened hospitals, and of course, new physicians continued to be trained.

In this study, the experiences in the field of radiology in the last period of the Ottoman Empire and the first decade of the Republic of Turkiye were discussed. During the University Reform that took place in 1933 in Turkiye and afterward with Turkiye's asylum for foreign medical doctors and scientists fleeing the Nazi regime, there were remarkable advances in radiology as well as in other areas.[35-36] Especially for that time, it is very important to establish the Radiology and Biophysics Institute of Istanbul Medical Faculty, which was one of the world's leading radiology centers.[37] It is planned to examine the experiences in this period and afterward in another study.

Conclusion

As a result; to develop the radiology adventure of Turkiye beginning in 1896 further, it is important to give importance to training in this field as much as before or even more, to train qualified manpower, to employ them in the right places, to follow the developments in the world and to have centers with modern devices. Having performed many of the listed; it is thought that Turkiye's new goal is to produce advanced technology devices used in radiology centers and develop new systems.

Information

1. In this study the second name of Röntgen was written in German as "Konrad" instead of Conrad.

2. Turkish Presidency State Archives Republic Archive is written in the form of BCA in the reference section of the study, and the date, fond, box, folder, and sequence information of the documents are given respectively.

Acknowledgements

The authors declare that there is no conflict of interest regarding this manuscript. No financial support.

Author Contributions

Fuat İnce: Idea/concept, design, control/supervision, analysis and/or interpretation, literature review, writing the article, critical review, references and fundings.

H. Kadircan Keskinbora: Idea/concept, design, control/supervision, analysis and/or interpretation, literature review, writing the article, critical review, references and fundings.

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