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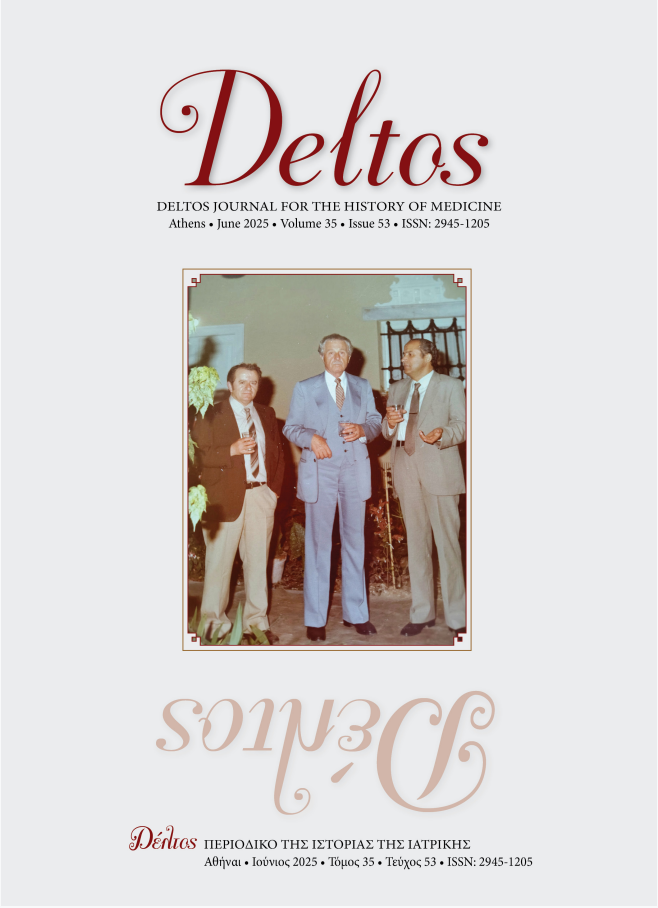

The First Steps of Renal Transplants in Mexico

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The First Steps of Renal Transplants in Mexico

Carlos A.Viesca y T.[1], Maríablanca Ramos R. de Viesca[2]

Abstract

Following the first successful kidney transplants performed by Joseph Murray and John Merrill in 1954, Mexican physicians and researchers began their own work in the field. Prompted by developments abroad, they engaged in theoretical study, laboratory research, and experimental procedures.

In 1962, José Carlos Peña established Mexico's first chronic haemodialysis programme at the Hospital de Enfermedades de la Nutrición, followed shortly by an intraperitoneal dialysis programme. That same year, the country's first kidney transplant from a living donor was performed by Manuel Quijano Narezo and Federico Ortiz Quezada. Two years later, the first transplant in an adult patient was conducted, and in 1967, the first procedure involving a cadaveric donor took place. A formal renal transplant programme was finally established in 1975 at the Mexican Institute of Social Security (IMSS).

Key Words: *Kidney Transplantation, Haemodialysis, History of Medicine, Mexico*

The First Renal Transplants in Mexico

Antecedents

The kidney was the first solid organ to be transplanted. As early as 1902, experimental attempts at renal transplantation in animals were underway. The Austrian surgeon Emerich Ullmann reported having transplanted a kidney into the neck of a dog, and shortly thereafter performed a similar procedure using a dog's kidney implanted into the neck of a goat. He later confessed to attempting a pig-to-human transplant by placing a pig's kidney into the elbow of a young woman, although this was ultimately unsuccessful due to technical limitations.

In the same year, Alexis Carrel also initiated experimental kidney transplants in dogs, implanting the organ in the neck of the recipient. He reported that circulation and urine output were successfully restored, but the animal died of acute infection. Nevertheless, Carrel concluded – prophetically - that "organ transplantation, a surgical curiosity today, may one day have a definite practical value…" (Küss & Bourget, 1991, pp. 27–28).

Mathieu Jaboulay was the first surgeon to attempt kidney transplantation in humans, reporting two cases in which pig and goat kidneys were transplanted into the cubital fossa of human recipients. Both attempts were unsuccessful due to vascular thrombosis. Three decades later, in 1933, the first recorded case of a homologous renal transplant was reported by Yuriy Voronoy. The donor was a 60-year-old man who had died following a skull base fracture, and the recipient was a 26-year-old woman in uraemic coma. She died four days after the transplant. Between 1933 and 1949, Voronoy performed five further cadaveric kidney transplants, all of which were unsuccessful.

In 1947, at the Peter Bent Brigham Hospital in Boston, Karl Landsteiner, Hufnagel, and David Hume reported a unique transplant case. The recipient eventually recovered native kidney function, and the graft was subsequently removed once normal renal function was confirmed.

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In the 1950s, kidney transplantation began to be practised systematically by David Hume and John Merrill in the United States, and by Jean Hamburger in France (Küss & Bourget, 1991, pp. 32–47; Ortiz Quezada, 1987, p. 94).

The first truly successful renal transplant was achieved following the acceptance of Küss's proposal that transplantation should initially be restricted to monozygotic twins. On 23 December 1954, Joseph Murray, John Merrill, and J. Hartwell Harrison performed a kidney transplant between 23-year-old identical twins, one of whom was suffering from advanced renal failure. Notably, the recipient's diseased were not removed until six months later. Over the following years, seven additional successful transplants were performed, all involving monozygotic twins (Küss & Bourget, 1991, pp. 45–46). At the same time in France, Jean Hamburger carried out six unsuccessful cadaveric transplants using kidneys from executed criminals. However, in 1962, he began a series of successful procedures after introducing pre-transplant radiotherapy for recipients.

First Steps Towards Renal Transplantation in Mexico

In Mexico, there was a clear and growing interest in renal disease and kidney failure, which intensified during the 1950s in response to emerging treatment approaches. In 1953, Ricardo Labardini y Nava published a notable paper entitled *"Vividiálisis y riñón artificial" (Dialysis in Living Subjects and the Artificial Kidney)* in the *Academy of Surgery Journal*. The publication attracted commentary from Aquilino Villanueva, a pioneer of modern nephrology in Mexico, who expressed his optimism regarding the potential of haemodialysis as a viable method for managing chronic renal failure (Labardini, 1953).

It was not until 1962 that José Carlos Peña, at the Hospital de Enfermedades de la Nutrición, established the first chronic haemodialysis programme in Mexico. Dr Peña returned to the country following his specialist training in nephrology at the Peter Bent Brigham Hospital in Boston, becoming the first formally trained nephrologist in Mexico. Between 1960 and early 1962, he trained under the guidance of John Merrill and Joseph Murray - pioneers in nephrology and renal transplantation - witnessing first-hand the progression of the first successful kidney transplant between non-identical twins. During this period, Dr Peña acquired a foundational understanding of haemodialysis, primarily from Merrill, who was a leading figure in the development of this therapeutic modality (Fig. 1).

Dr José Carlos Peña recognised haemodialysis as an indispensable element for the success of renal transplantation, providing the necessary artificial maintenance of renal function and thereby allowing time to identify a suitable donor (Peña, 2023, p. 188). In addition to establishing haemodialysis in Mexico, Peña also developed and implemented intraperitoneal

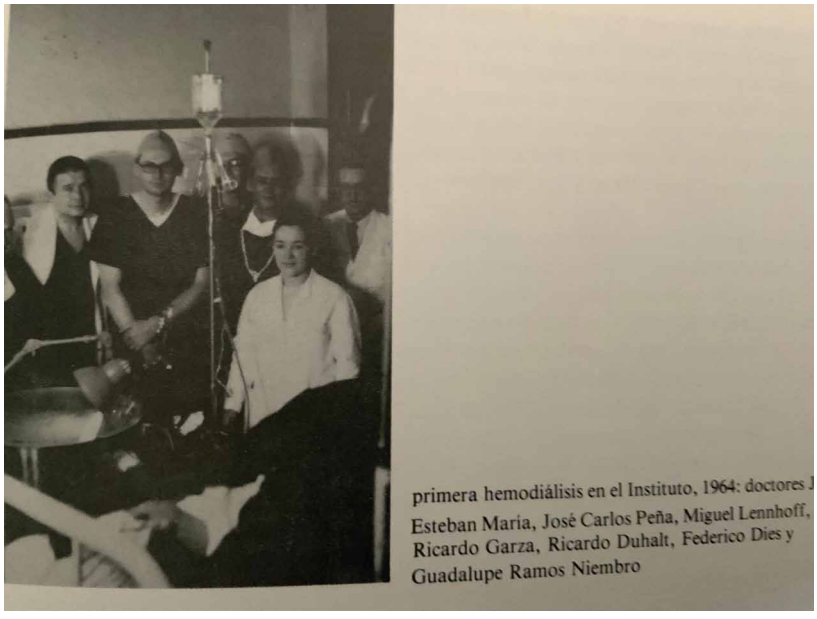

Figure 1. The first haemodialysis, José Carlos Peña and his collaborators. 1962.

dialysis, drawing on the innovative models of Wilhelm Kolff. He further introduced the practice of creating external urinary fistulas, as originally described by Scribner. These topics featured prominently in his early presentations at the *Academia Nacional de Medicina de México* (Peña, 1968; Cárdenas de la Peña, 1991, I: 371). In 1964, he published his findings on peritoneal dialysis as both a therapeutic measure and a support method for patients with renal insufficiency (Peña, 1964). His contributions extended beyond his own institution, serving as the foundation for similar dialysis programmes at the *Hospital Infantil de México* - today named after its founder, Federico Gómez - and at the General Hospital of the National Medical Centre of the Mexican Institute of Social Security *(Hospital General del Centro Médico Nacional, Instituto Mexicano del Seguro Social, IMSS).*

This foundational groundwork proved essential, as did the arrival of Federico Ortiz Quezada to the Urology Service at the General Hospital of the National Medical Centre of the Mexican Institute of Social Security (IMSS) in July 1963 (Fig. 2). After completing his initial training as a specialist at the General Hospital of Mexico *(Hospital General de México)*, Ortiz Quezada continued his education at Cornell University in New York. There, he completed his urology training and both witnessed and participated in kidney transplant surgeries at the New York Hospital. Upon returning to Mexico and joining the Urology Service at the General Hospital of the Medical Centre, Ortiz Quezada advocated for the feasibility of performing renal transplants on actual patients. He presented clinical cases and consulted with his former professors in New York before moving forward (Méndez et al., 2014, p. 1107; Ortiz Quezada, 2024). In his Memoirs, Ortiz Quezada recounts his time as a medical resident in 1962 at the New York Hospital - Cornell Medical Center. Reflecting on the day the first renal transplant was performed at that institution, he wrote: *"I understood, alongside those committed surgeons, that in time we would be able to help those who once would have died from renal failure"* (Ortiz Quezada, 2001, p. 59).

The First Renal Transplant in Mexico

Shortly after Federico Ortiz Quezada's return in July 1963, the director of the hospital, Dr Manuel Quijano Narezo - a highly respected general surgeon - was persuaded by Ortiz Quezada that the time had come to initiate the first series of renal transplants in Mexico.

Manuel Quijano was born in San Luis Potosí in 1919 and passed away in Mexico City on 17 February 2017 (Fig. 3). He studied medicine at the National Faculty of Medicine in Mexico City and continued his surgical training in the United States and France. Upon his return to Mexico, he joined the General Hospital of Mexico (Hospital General de México) and later contributed to specialised developments in pancreatic and gastroduodenal surgery at the National Institute of Nutritional Diseases (Instituto Nacional de Enfermedades de la Nutrición). He subsequently served as director of the General Hospital of the National Medical Centre of the Mexican Institute of Social Security (Hospital General del Centro Médico Nacional, IMSS), where he remained actively involved in surgical innovation. It was at this

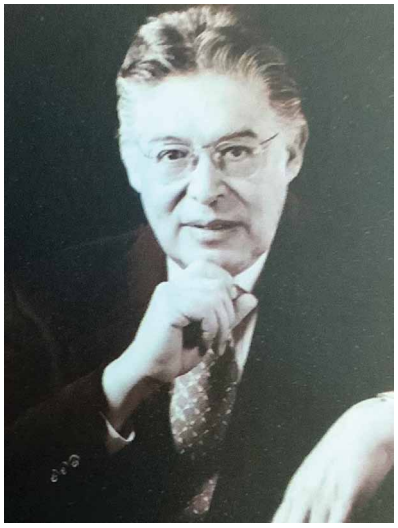

Figure 2. Dr. Federico Ortiz Quezada.

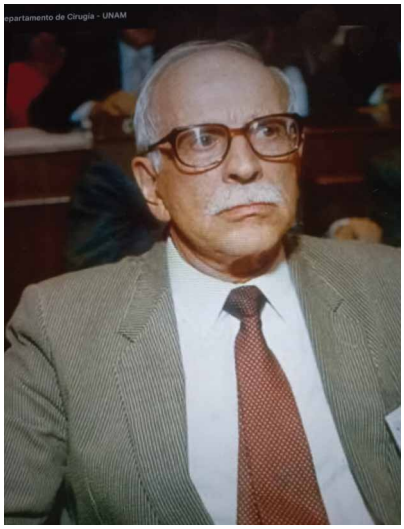

Figure 3. Dr. Manuel Quijano Narezo.

institution that he and his team performed Mexico's first renal transplants.

As previously noted, Dr Quijano had already established several important surgical precedents prior to his involvement in renal transplantation. In 1952, he became the first surgeon in Mexico to successfully perform a duodenopancreatectomy. In the years that followed, he conducted research into the relationship between metabolic processes and surgical procedures, and from 1957 onwards, he focused on the development of various surgical techniques in gastroduodenal and biliary surgery.

Thus, in the second half of 1963, Dr Manuel Quijano Narezo led the team that performed the first renal transplants in Mexico. The surgical team included Francisco Gómez Mont, Federico Ortiz Quezada, and Regino Ronces (Fig. 4).

The first patient was a 23-year-old man who had suffered from recurrent ureteral lithiasis and had developed a ureteral stricture. Following several procedures aimed at relieving the obstruction - along with two unsuccessful attempts at ureteroplasty - the only immediate solution was the creation of an external urinary fistula. At that point, and under the strong recommendation of Ortiz Quezada, Dr Quijano opted to perform an autotransplantation of the affected kidney. The kidney, which could no longer drain urine through the damaged ureter, was repositioned into the ipsilateral iliac fossa. As this was an autotransplant, immunological rejection was not an issue, and normal urinary function was soon restored. Thus, Mexico's first renal transplant - a successful autotransplant - was completed.

Figure 4. Dr. Francisco Gómez Mont.

The Immediate Subsequent Transplants

In the months following the first renal autotransplant, Dr Manuel Quijano Narezo and his surgical team performed two additional successful renal transplants during the same year, 1963.

The first of these involved a 31-year-old woman with a medical history of recurrent tonsillitis, which had resulted in severe episodes in 1960 and 1963, ultimately leading to advanced renal failure. Laboratory tests revealed urea levels of 329 mg/dL and creatinine levels of 16.2 mg/dL.

Prior to surgery, the patient underwent a six-hour dialysis session. The procedure was a homotransplant, with her 35-year-old sister serving as the donor. The donor was fully compatible in all leukocyte antigens, with the sole exception of the E antigen of the Rh group. Post-operatively, the recipient experienced anuria for the first 24 hours, after which diuresis resumed normally. In the hours that followed, she presented with haematuria, fever, and leucocytosis (22,000/mm^3). Immunosuppressive therapy began immediately after surgery, including Imuran (azathioprine), 6-mercaptopurine, and actinomycin. Cortisone was added in response to an antigen rise. A cystostomy was placed to monitor renal function. Twenty-one days after the transplant, a biopsy of the transplanted kidney was performed. One month after the procedure, a bilateral nephrectomy was carried out to remove the patient's native kidneys, leaving only the grafted kidney in situ as the definitive source of renal function (Quijano et al., 1964).

This surgical intervention took place on 23 October 1963. The patient, Martha Bejarano, received a homograft, as previously noted. She went on to live in good health for more than twenty years following the procedure, and her death was unrelated to renal complications or consequences of the transplant (Ortiz Quezada, 1987, p. 94).

The same surgical team performed a third transplant at the end of November 1963, just eight days prior to the official report of these initial cases. The original report, detailing all three procedures, was presented during a session of the *Academia Nacional de Medicina de México* on 6 December 1963 and subsequently published in the *Gaceta Médica de México*, the Academy's official journal, in its first issue of 1964 (Quijano et al., 1964, pp. 93–103).

The Procedure

The surgical intervention was carried out by two teams operating in parallel - one responsible for the donor and the other for the recipient.

The transplanted kidney was placed in the recipient's left iliac fossa.

The renal artery was anastomosed to the hypogastric artery using an end-to-end (termino-terminal) technique. The renal vein was connected to the external iliac vein via an end-to-side (termino-lateral) anastomosis. The ureter was implanted into the bladder using a submucosal tunnel technique to facilitate urinary drainage.

The immediate postoperative course was marked by a rapid and stable recovery. Following only one minute of ischaemia, normal blood flow to the transplanted kidney was successfully re-established. As previously noted, diuresis was fully restored within 24 hours. One month after the procedure, the patient's two damaged kidneys were surgically removed. Immunosuppressive treatment with Imuran was initiated to prevent antigenic rejection.

It is important to note that the official report was published only three months after the procedures took place.

Subsequent disclosures have added nuance to the original account. It has since been affirmed that the lead surgeon during these interventions was in fact Federico Ortiz Quezada, while Dr Manuel Quijano, as hospital director, oversaw and authorised the procedures. As a member of the *Academia Nacional de Medicina de México*, Quijano was listed as the first author of the published report, reflecting his official role (Ortiz Quezada, personal communication to Carlos Viesca). As a tribute to his pioneering work, the transplant operating theatre at the IMSS *Centro Médico Nacional* was later named "Federico Ortiz Quezada" in his honour.

In 1967, the same hospital and surgical team performed the first renal transplant in Mexico using a cadaveric donor.

That same year, Dr Gustavo Argil, a distinguished nephrologist, delivered a presentation to the *Academia Nacional de Medicina de México* as part of a symposium on the evaluation of treatments for chronic uraemia. In his address, he offered a detailed and timely analysis of the challenges and benefits of renal transplantation, presenting it as a truly feasible and valuable therapeutic option (Argil, 1968).

The Sequence

An interesting event occurred in 1965. That year, the distinguished urologist Carlos E. Talancón presented a reflection on renal transplantation before the Academia Mexicana de Cirugía (Mexican Academy of Surgery), which was subsequently published in the Academy's journal, *Cirugía y Cirujanos*. What stands out is that the article made no reference to the renal transplants that had already taken place in Mexico. Instead, it focused on reviewing major international developments in the field. Talancón highlighted several key findings from recent studies, including the identification of 15 genes in mice related to antigenic response, the role of lymphocytes in homograft rejection, the promising use of splenectomy as a method of rejection prophylaxis in animal models, and the beneficial effects of radiation-induced lymphopenia. He also presented statistics from the XIII International Congress of Urology, held in London in September 1964, which raised important questions. Among the data shared were that only one out of 120 unrelated-donor homotransplants had survived beyond one year, and just five out of 91 transplants from closely related donors had survived longer than two years. In stark contrast, 28 out of 33 kidney transplants between identical twins had resulted in long-term survival. Talancón concluded with a reference to the landmark 1954 transplant performed by Harrison and Murray in monozygotic twins, emphasising its historical significance (Talancón, 1965).

In practical terms, research on renal function, artificial kidneys, and dialysis continued at the Instituto Nacional de la Nutrición. In 1965, an initial Transplant Unit was established, as part of a broader and more ambitious Division of Experimental Surgery. This unit was placed under the direction of Dr Carlos de la Rosa, who had recently completed his surgical specialisation under Lester R. Dragstedt in Florida. On 17 August 1967, the unit carried out its first kidney transplant: a cadaveric homograft in a young woman. Although the immediate postoperative course appeared satisfactory, the patient ultimately died from generalised sepsis resulting from a pericardial abscess. The surgical team included Manuel Campuzano as lead surgeon (Fig. 5), with Sergio Cárdenas and Carlos de la Rosa as surgical assistants, Gabriel Camacho as anaesthesiologist, and José Carlos Peña as nephrologist (Cárdenas de la Peña, 1991, pp. 374, 397). One year later, on 14 August 1968, the same institute performed its second kidney transplant, this time using a living donor. The recipient was a 29-year-old man with chronic glomerulonephritis and renal failure; the donor was his 27-year-old sister. The operation was preceded by all diagnostic and preparatory procedures then available, including histocompatibility testing, renal function assessments, pyelography, aortography, and eight months of haemodialysis. Notably, the patient received

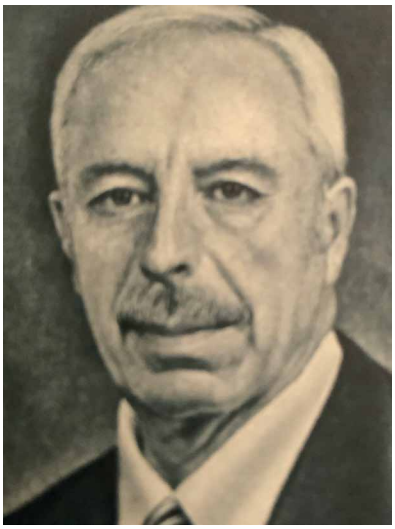

Figure 5. Dr. Manuel Campuzano

antilymphocytic globulin as part of the immunosuppressive regimen - marking the first use of this therapy in Latin America. The transplant was successful, and after one month of postoperative hospitalisation, the patient was discharged in full recovery (Cárdenas de la Peña, 1991, vol. I, pp. 375–398).

In order to establish a national transplant programme, the Academia Nacional de Medicina, acting in its role as a consultative body to the Mexican Government, was requested to issue an official statement regarding organ transplantation in human subjects. The Academy's response was, logically, favourable. However, it recommended that any such procedures be carried out only under conditions that ensured reasonable safety for both donor and recipient. It also emphasised the necessity of conducting all relevant medical and ethical evaluations prior to transplantation (Academia Nacional de Medicina, Dictamen, 1968).

In 1975, a renal transplant programme was established at San José Hospital in Monterrey, Nuevo León.

That same year, after several years of performing transplants on an individual case-by-case basis, a formal renal transplant programme was launched within the Mexican Institute of Social Security *(Instituto Mexicano del Seguro Social, IMSS).* This initiative was soon expanded and transformed into the National Coordination Office for the Institutional Transplant Programme within IMSS.

Subsequently, a broader national organ transplant programme was developed - encompassing not only renal transplantation - which remains active to this day and continues to play a vital role in the country's public health system.

The Latin American landscape

A comparative view of the first renal transplants across Latin America provides useful context to Mexico's early developments. The earliest attempt in the region occurred in Argentina. On 11 June 1957, Professor Alfredo Lanari of the Third Chair of Medical Clinics at the Hospital de Clínicas de Buenos Aires performed haemodialysis and renal transplantation on a 16-year-old recipient. The donor was an anencephalic newborn, and both kidneys were implanted together in the recipient's inguinal region. Unfortunately, survival was limited to only a few days (Maheles Molins and Alfonso Ruíz Guiñazú, p. 83). A second transplant attempt in Argentina took place in 1961, also led by Lanari, then working at the Buenos Aires Institute of Medical Research. On this occasion, an eight-year-old girl received a kidney from a cadaveric donor. The graft functioned successfully and showed no signs of rejection; however, the patient died 45 days later from sepsis (Pomeranz et al., 2014, pp. 83–84).

In the same year as Mexico's first renal transplant, 1963, Colombia also registered its first kidney transplant. The procedure took place at Hospital San Juan de Dios in Bogotá, performed by surgeons Fernando Gómez Rivas and Enrique Carvajal Arjona. A second transplant was reported in Bogotá three years later, in 1966, followed by another in Medellín in 1968, conducted by a surgical team comprising Jaime Borrero R., Álvaro Velázquez O., and Gustavo Escobar. It was not until 1973, however, that Colombia achieved its first truly successful renal transplant. This case involved a cadaveric donor, with the patient enjoying twelve years of good renal function before experiencing graft failure - after which a second successful transplant was performed (Restrepo, 1990, pp. 60–61).

Peru and Brazil both recorded their first renal transplants in 1965. They were followed by Chile in 1966, where the first procedure was performed on 22 November by Fernando Morgado, although the outcome was unsuccessful. On 4 January 1968, following extensive experimental work involving 145 transplants in dogs, a second human kidney transplant was carried out. This time, the kidney came from a cadaveric donor; however, the recipient survived only 42 days (Thambo, 2017; Lazcano et al., 1967).

Around the same period, Venezuela entered the field of renal transplantation. In 1967, a cadaveric donor transplant was performed at the Hospital Universitario de Maracaibo by Bernardo Rodríguez Iturbe and Humberto Rivera Orozco. The following

year, in 1968, a living donor transplant was carried out at the Hospital Universitario de Caracas. In 1969, kidney transplants were conducted in San José, Costa Rica, at the Clínica Católica, and in Uruguay, where, following extensive research involving animal models, two transplants from cadaveric donors were performed (Pereyra Bonassi, 1964; Rodríguez Juanicó, 1990, p. 185). In Cuba, at the Instituto de Nefrología in Havana, the first kidney transplant was conducted on 24 February 1970 by Oscar Suárez Savio and Alfredo Gómez Samperio. Shortly thereafter, Cuba developed Infomed, a national transplant and medical information network. In Bolivia, the first renal transplant was performed on 2 November 1979 in La Paz by Néstor Orihuela Montero, using kidneys from a single cadaveric donor for two recipients. Guatemala performed its first kidney transplant in 1982, followed by Panama in 1990.

Conclusions

Mexico was one of the earliest countries in Latin America to carry out a renal transplant, second only to Argentina. This early achievement was supported by academic exchanges between Mexican nephrologists and surgeons and their counterparts in the United States, who were global pioneers in renal transplantation.

A recent and significant success occurred on 21 February 2025, at Hospital Juárez in Mexico City. A medical team comprising Paulina Carpinteyro Espin, Head of the Transplant Unit; Juanita del Socorro Pérez Escobar, Director of the Liver Transplant Programme; and Ricardo Iván Velázquez Silva, Head of the Renal Transplant Programme, successfully performed a simultaneous liver and kidney transplant. The recipient was a 39-year-old man with hepatic cirrhosis and chronic renal failure. Five weeks after the surgery, the patient is now recovering at home (Anónimo, 2025).

ΠΕΡΙΛΗΨΗ

Τα Πρώτα Βήματα των Νεφρικών Μεταμοσχεύσεων στο Μεξικό

Carlos A.Viesca y T., Maríablanca Ramos R. de Viesca

Μετά τις πρώτες επιτυχημένες μεταμοσχεύσεις νεφρού που πραγματοποιήθηκαν από τους Joseph Murray και John Merrill το 1954, Μεξικανοί ιατροί και ερευνητές ξεκίνησαν τη δική τους πορεία στον τομέα. Παρακινούμενοι από τις εξελίξεις στο εξωτερικό, επιδόθηκαν σε θεωρητική μελέτη, εργαστηριακή έρευνα και πειραματικές διαδικασίες. Το 1962, ο José Carlos Peña ίδρυσε το πρώτο πρόγραμμα χρόνιας αιμοκάθαρσης στο Μεξικό, στο Νοσοκομείο Hospital de Enfermedades de la Nutrición και ακολούθως ένα πρόγραμμα ενδοπεριτοναϊκής κάθαρσης. Την ίδια χρονιά, πραγματοποιήθηκε η πρώτη μεταμόσχευση νεφρού από ζώντα δότη στη χώρα, από τους Manuel Quijano Narezo και Federico Ortiz Quezada. Δύο χρόνια αργότερα, πραγματοποιήθηκε η πρώτη μεταμόσχευση σε ενήλικο ασθενή και το 1967 έλαβε χώρα η πρώτη μεταμόσχευση με πτωματικό δότη. Ένα επίσημο πρόγραμμα μεταμόσχευσης νεφρού ιδρύθηκε τελικά το 1975 στο Μεξικανικό Ινστιτούτο Κοινωνικής Ασφάλισης (IMSS).

Λέξεις Κλειδιά: *Μεταμόσχευση νεφρού, αιμοκάθαρση, ιστορία της ιατρικής, Μεξικό*

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