

# One hundred years since the first Spanish medical air transport

## *Cien años del primer aerotransporte sanitario español*

Salvador Espinosa Ramírez<sup>1,2</sup>

On June 8<sup>th</sup>, 1923, Chicuelo fought in Madrid (Spain), but he did not manage to fully redeem himself in that 4<sup>th</sup> bullfight in the capital, which meant he was not hired in the provinces despite his “successes.” In the Senate, at a quarter to 4, the Count of Romanones opened the session, in which the Count of Mortera spoke about the problem of Morocco; he said that “the objective was mistaken, and instead of a protectorate, a military occupation had been carried out, which was condemned by both the people and the politicians”.<sup>1</sup>

At the same time, in the Hospital Dar Drius (Morocco), several severely injured soldiers had been admitted, among others, Lieutenant Rafael Carbonell, Private Agustín Vega; seriously injured Private José Mora, and less seriously injured Private Abdón Martín, among others.<sup>2</sup> The military medical authorities of that hospital decided that, to save the lives of some of the victims, they had to transfer them to Nador, where there were more medical resources. The distance was not great, but by land, using pack animals, the trip would take two days, which would mean the death of those patients. For that reason, it was decided to do it by air, in a Breguet XIV airplane, a biplane made of wood, canvas, and metal.<sup>3-5</sup>

Lieutenant Rafael Carbonell Muñoz became the first wounded person to be transported by airplane in Spain. He had never flown before; he was carried by his comrades on a stretcher to the aircraft, feeling less pain due to the morphine he had been given, which also kept him calm. He was placed inside the plane, which smelled of fuel; something in him tensed upon hearing the roar of the 300-hp Fiat engine. The medic accompanying him, Corporal Fullá, held his hand. The two looked at each other, closed their eyes, felt their stomachs shift, and Lieutenant Sbarbí, the pilot of that flight, told them that they were already in the air. Twenty-five minutes later they landed at the Nador airfield, where an ambulance awaited to take him to the hospital. Meanwhile, news spread among the

troops at Dar Drius: a wounded soldier had been transported by airplane so he could be treated. The soldiers smiled; they felt safer. They knew that if they were wounded, they would have greater chances of survival. Unfortunately, despite all efforts to save his life, Lieutenant Carbonell died on June 9<sup>th</sup>.<sup>6</sup>

We have allowed ourselves some literary license, as part of the information mentioned above is not documented, but in the words of General Hernández Abadía, the medical deployment carried out when our army goes on a mission boosts morale, since everyone is certain that someone will take care of them if they fall ill or are wounded. In this, he coincides with U.S. Major General Spurgeon Neel, who, speaking of MASH (Mobile Army Surgical Hospital) units and the DUSTOFF medical helicopter teams, said that they were an important factor in maintaining high morale among Army troops in Vietnam.<sup>7,8</sup> Perhaps the great difference between what happened in Spain and what happened years later in the United States is that we failed to set down in writing—in an article in JAMA—that the same thing done for wounded soldiers could, as Neel said, be done in the isolated rural areas of the United States and on the outskirts of large cities, meaning that, in his words, “the injured person is not condemned to be evacuated to the nearest hospital, but to the most appropriate one for his care,” which became the basis of modern integrated emergency systems.

In 1999, in Spain, 29 helicopters engaged in medical missions and transported 4,870 patients during the previous year. All of this with significant differences among the 18 existing programs in 13 autonomous communities, in terms of activity, material resources, and personnel.<sup>9</sup> Only the Canary Islands helicopters, at that time, had real 24-hour operational capacity, performing night flights between islands for inter-hospital transfers. And in light of the publication by Lubillo *et al.*, unlike the heroic and highly regarded DUSTOFF medical teams in Vietnam, medical personnel in Spain usually did not have

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fire-retardant clothing or flight helmets, unlike aeronautical personnel. Perhaps the morale of the population of the Canary Islands changed when in 1998,<sup>10</sup> in a ravine on the island of La Gomera, a patient with chest pain was rescued. Or that of Castilla-La Mancha, when in November 2001, the medical helicopter *Gigante 02*, based in Algodor (Toledo), transferred a patient with a time-dependent neurosurgical condition from Ciudad Real to Madrid. A transfer that, by road at that time, would have taken around three hours was completed in 45 minutes. This is very important: we bring the appropriate treatment closer to the patient; that is, we boost the morale of the population.<sup>7</sup> We show them that cutting-edge treatments are no longer only for citizens living in major cities.

Over the past 35 years, an extensive network of advanced life-support resources has been developed throughout the national territory.<sup>11-13</sup> The network of hospitals and services for the diagnosis and treatment of so-called time-dependent conditions has also grown. But this development does not guarantee that islands, remote areas, or regions with low population density have solved the problem of time. Time is muscle, time is brain, time is life. The only way to reduce time is to give ambulances wings or rotors. Modern helicopters have cruising speeds of about 250 km/h, far higher than the 170 km/h of the Breguet XIV. The development of medicalized air transport (HEMS) represents an ethical commitment and a commitment to equity. In the words of José Bono, "If I returned to my childhood, and over the poplar grove of Salobre another helicopter flew again, I would feel the same curiosity as I did as a boy, but this time I would be certain that inside that aircraft would not be Don Samuel, nor a governor, nor a general, but perhaps an elderly person, a child, or a woman in labor, humming toward the nearest hospital".<sup>14</sup>

Some readers who have reached this point may be satisfied with the level of HEMS in Spain, but others may be wondering whether there is still more to be done. The answer is yes. There remain architectural elements in hospitals that would allow direct transfer from the helipad to the emergency department—something impossible in many of our hospitals. In most of them, helipads fall into the category of remote helipads, meaning those requiring an ambulance to transfer the patient from the helicopter to the hospital when landing on hospital grounds. This causes increased transport time, another handoff between care teams, and additional risk for the patient, who must endure another ground transfer not free of complications, estimated at up to 14%.<sup>15</sup>

There is also a lack of transfer helipads in rural areas, with appropriate maintenance and night-flight capability. In 2022, we read the Minister of the Presidency of the Government of Aragón speaking of "equal conditions" in small towns vs large urban centers, stating: "If someone has a nighttime heart attack in La Iglesiasuela del Cid, they would reach *Hospital Miguel Servet* (Zaragoza, Spain) in 3 hours

by ambulance. With the helicopter on night flight, they will do it in barely 80 minutes".<sup>16</sup> In that report, the Minister spoke about a project to implement helipads suitable for nighttime operation. It is wonderful news, currently in development, though little time has passed and there has been a change of regional government. Furthermore, in the report we can see that the example used refers to 2 locations about 130 km apart, so the time should actually be shorter, although when we look at Hospital Miguel Servet, we see it has a helipad—but a remote one, meaning without direct access to the emergency department. This example is not anecdotal: Spain is full of similar situations, regardless of the political party governing each autonomous community.

Many improvements remain to be made in air medical transport in our country, including the development of a medical transport decree specifying the requirements that aircraft must meet. Royal Decree 619/1998<sup>17</sup> of April 17<sup>th</sup> established the technical characteristics, medical equipment, and staffing requirements for ground medical transport vehicles. Four years later, Royal Decree 836/2012<sup>18</sup> of May 25<sup>th</sup> was published to correct elements that experience had shown needed to be replaced or added. Both decrees sought to ensure minimum quality standards for ground transport. Neither mentioned air transport.

A new regulation is therefore urgent. It should of course change the required qualifications of the personnel providing advanced life support, both in ground and air units. At present, the only requirement for nurses is to be a nurse, and for physicians, to be a physician. It is urgent that the new decree include the competencies these professionals must demonstrate—competencies that should be regulated within what must become the new specialty of Emergency Nursing and that of Emergency Medicine.<sup>19-22</sup>

A new Royal Decree is urgent because new aircraft must be suitable for new treatment technologies; they require interior spaces and designs that allow such procedures to be performed safely. We refer to techniques such as ECMO,<sup>23</sup> REBOA,<sup>24,25</sup> blood transfusion and blood products<sup>26-28</sup> which, although still requiring more studies on their effectiveness in the prehospital environment, demand specific training of professionals through methodologies such as clinical simulation,<sup>29,30</sup> which allow standardized team-based training and improve outcomes.

Finally, a fundamental area is research, currently scarce and focused mainly on the effectiveness of this method of transport in patients who have suffered trauma, coronary syndrome, stroke, or on airway management and ventilation.<sup>31</sup> But there are few trials and studies on the effectiveness of diagnostic, monitoring,<sup>32,33</sup> or treatment measures.

There is still a long way to go and important improvements pending in Spain's air medical transport system. Let us hope that those who write this editorial ten years from now will be able to say that those deficiencies have already been addressed.

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