Rom J Leg Med [28] 8-13 [2020]
DOI: 10.4323/rjlm.2020.8

PUBLIC PROSECUTORS FEATURING FORENSIC PATHOLOGISTS: JUDICIAL CONTROVERSIES IN ORGAN PROCUREMENT SURGERY – LITERATURE REVIEW AND CASE REPORT

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Abstract: Organ transplantation has been recognized as one of the greatest discovery of the century as it provides a way of giving the gift of life to patients with terminal failure of vital organs, which requires the participation of society by donating organs from deceased or living individuals. Over the years it caused a lot of controversial local, ethical, social, cultural and legal problems. In this article we want to approach the loss of donors due to medical examiner's refusal in traumatic deaths.

Key words: organ donor, organ transplantation, traumatic deaths, coroners, judicial.

INTRODUCTION

The clinical protocols related to organ and tissue recovery are known by the entire team of the intensive care unit, though few of them understand the forensic or legal implications. The United Network for Organ Sharing in US was born to increase the number of transplantable organs and tissue. The multitude of medical, legal and forensic implications interacts with the rigour of the laws regarding the collection and donation of human organs and tissues [1].

The brain death and circulatory death donors are the primary source of donated organs for organ procurement. Trauma patients who suffered neurological fatal injuries or other vital injuries are the main source for organ donations. Despite favourable laws and regulations, the shortage of organ procurement depends on a number of variables: denied consent from family members, safety driving laws, a downward trend in gunshot wounds and other traumatic brain injuries. Also, Shafer claimed that another reason for shortage of organ procurement is the medico-legal death investigation because a lot of donor organs tend to be lost due to refusal of medical examiner/coroner in violent or suspect deaths [1].

According to U.S. Government Information on Organ Donation and Transplantation, in the USA there are over 112.000 people (men, women, children) on the national waiting transplant list as of March 2020. In 2019, in the USA were performed about 39.718 transplants. Each year, the number of people on the waiting list has a greater increase than the number of donors and available organs for transplants. Statistics show us that 20 people die each day waiting for an organ transplant and every 10 minutes another patient is added to the transplant waiting list [2].

In Europe 2018 were performed about 34.221 surgical transplantations. The organs that patients need the most are the kidneys and the liver (21.227 kidney transplants, 7.940 liver transplants). In Romania, the number of organ transplantations decreased from 2016 when were around 124 surgeries performed, whereas în 2018 only 65 surgeries took place [3].

Historical background

Researchers have experienced organ and animal transplantation since the eighteenth century. There have been many failures over the years, but in the middle of 20th century, scientists had successfully performed organ transplants [4].

In 1954 Joseph Murray transplanted a kidney from one identical twin to another, so he launched a new era in medicine. In 1990 his work, alongside E.D. Thomas, was rewarded with the Nobel Prize for Physiology and Medicine. He died at the age of 93 in November 2012.

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In 1967, the first successful liver transplant was performed by doctor Thomas Starzl. In the same year also took place the first heart transplant attempt, performed by doctor Christiaan Barnard (South African surgeon) at the Groote Schur Hospital in Cape Town. He successfully transplanted the heart of a 24-year-old woman, who died in a road accident, to a 54-year-old man. Unfortunately, he died 19 days later from severe pneumonia as a result of immune deficiency due to immune suppressive treatment [4].

The first attempts of organ transplantation in Romania date from the 20th century and belong to doctor Florescu who was working in the Laboratory of Experimental Surgery of the Faculty of Medicine in Bucharest and he performed several unsuccessful experimental kidney transplants [5].

In 1958, professor doctor Agrippa Ionescu performed the first skin transplant and, in 1962, the first corneal transplant [5].

In February 1980, the first successful transplant in Romania of a solid human organ was performed by professor Eugeniu Proca at the Urology Clinic of Fundeni Hospital in Bucharest: kidneys from living donor (the patient's mother). Soon after this success, a team led by professor doctor Petru Drăgan from Timisoara performed a kidney transplant from the deceased donor [5].

Over the years, the protocols for donating organs got more rigorous. Donors were limited to ages between 10 and 50 years and without co-morbid pathologies. Due to increasing demand, the restrictions have been eased, therefore nowadays there are only two absolute contraindications for organ procurement: malignancy and transmissible diseases [6].

METHOD

We reviewed the literature as well as national and international legislations regarding forensic/ medico-legal implications for organ donors and transplants, thus we would like to point out a few particularities that we consider relevant in illustrating the judicial controversies of the subject.

Legislation across the USA and some countries in Europe

Pediatric violent deaths remain the area with the highest number of judicial or coroner refusals across the USA [7]. Several US States adapted their legislation in order to facilitate the organ procurement and subsequently the organ transplantation. For example, in some US States (Texas and New Jersey), the legislation limits the involvement of medical examiners and coroners in the denial of organ procurement. If the medical examiner considers that some specific organs may have lesions that are relevant in determining the mechanism and/or causes of death and concludes to disapprove the harvesting, this decision has to be done in the operating room.

In uncertain cases, a biopsy of the organ can be solicited. In case of a disapproval, this decision must be strongly justified and documented [8, 9].

- The New York law states that medical examiner can only participate at the donation procedure [10].

- The Tennessee law denies medical examiners to interfere with the organ procurement procedure [10].

- The New Jersey law requests medical examiners to participate to the donation if they think that organs and tissue harvesting might be involved in the cause of death, thereby the medical examiner can request a biopsy or deny removal of the organ. The medical examiner should explain in writing the reason why the organs may be involved in the cause of death [10].

- In order to increase the number of donors for transplants and to improve the medico-legal investigation, the training of forensic nurse is also very important because they have a variety of roles, including evaluating and caring for victims of assault, domestic abuse, neglect, sexual crimes, collecting and securing evidences. In this way, the forensic nurse can collect data for death investigation, cooperating with family, gathering information about injuries including photos, clinical and paraclinical investigations and may provide the medical examiner/coroner the results of diagnostic tests [11].

In Spain, judicial denials in the context of violent deaths or non-natural causes of death for the organ procurement are rare. The percentage of judicial or forensic pathologist refusal was about 2,5% of the cases during a time frame between 1998-2006, according to Spanish National Transplant Organization [12].

In France, refusals of organ procurement by a prosecutor in cases of forensic deaths occur in about 2% of these cases [13]. In a study conducted between 2003-2011, the denial for organ procurement was mostly caused by the requirement of preserving evidence in order to perform the autopsy in cases of death in unknown conditions or violent deaths [14].

The French Society of Forensic Medicine has issued in 2013 a national guideline on practical

procedures for organ procurement in cases of forensic deaths that need to be investigated.

The guideline emphasizes the need of protocols between judicial authorities, forensic pathologists and transplant teams and the importance of the donor's body examination performed by the forensic pathologist in the intensive care unit before the organ procurement surgery. It is also forbidden to procure skin fragments since trauma marks could be of forensic importance and relevant for further investigation [14].

Ever since the guideline has been issued, the rate of refusal has dramatically decreased, from 4.3% in 2011 to 1.7% in 2016 [13].

The attendance of the forensic pathologist during the procurement surgery is not mandatory and is decided if relevant facts are provided. The autopsy can be subsequently performed, ideally by the same forensic pathologist who previously performed the examination.

According to the German legislation, in all cases of non-natural deaths (accidents, intoxication, suicide) the police and the prosecutor are informed. The permission for organ procurement can only be given by the prosecutor. If an autopsy is considered necessary, the prosecutor makes contact with a forensic pathologist. The forensic pathologist may be present or not during the surgery for harvesting, but will always perform the autopsy subsequently and a detailed surgical report from the transplant team is required [15].

A retrospective study using data from the time frame between 2007-2017 conducted at Institute for Legal Medicine in Frankfurt am Main showed a rate of judicial denial of organ procurement of approximately 1% in cases of non-natural deaths that required judicial investigation [16].

Legislation in Romania

According to the legal framework and the Romanian legislation, the death with medico-legal implications (according to the law no. 459/2001-Procedural norms, art. 34) is either a violent death, the cause of the death is unknown, or the death is suspicious. Thus, according to the "Law on the organization and functioning of the Legal Medicine Institutions", Law no. 459/2001, the death is considered suspicious in the following situations:

- sudden death;
- the death of a person whose health was checked periodically from a medical point of view;
- deaths occurring within official working hours;
- deaths occurring in custody, in detention or deprived of liberty, in psychiatric hospitals, in penitentiary hospitals, prisons or police arrests, as well as death associated with police or army activities (for example, in the event of public demonstrations) or any deaths that raise suspicion of human rights violations, such as suspected torture or any other form of violent or inhuman treatment;
- multiple deaths in an area or within a short time frame;
- unidentified or skeletonized bodies;
- deaths related to deficiency of medical assistance, in the application of the prophylaxis measures or job safety measures;
- the patient's distress occurred during or shortly after a medical-surgical diagnostic or therapeutic intervention [17].

The removal of organs and/or tissues is very clearly regulated by Law 95/2006, art. 148.

According to art. 148, para. (8) the collection of organs, tissues and cells of human origin, in forensic cases, is done only with the consent of the forensic examiner and should not compromise the result of the forensic autopsy [18].

As provided in the law at art. 155, if the sampling compromises the result of the forensic autopsy, it is a crime. In the case of a cranio-cerebral trauma resulting in a brain death of the patient, which occurred as a result of a violent act, the sampling cannot be performed without the consent of the forensic pathologist. It should be kept in mind that the organ removal is performed in the thoracic and abdominal cavities, which are not affected by the violent act. In cases where there are lesions of these cavities, the respective lesions will be described in the operating protocol during the cavity inspection, as the initial stage of the intervention before it is actually started. This operating protocol can be used as a source of medical information for subsequent autopsy [19].

CASE REPORT

We report a case from National Institute of Legal Medicine "Mina Minovici" Bucharest of a 45-year-old woman, who was admitted to a hospital via emergency room after suffering a severe cranio-cerebral trauma caused by a car vs. pedestrian high-speed impact. The patient has been intubated by the emergency team at the accident scene. On arrival at the hospital, the patient had a GCS score of 3 points, anisocoria and nonreactive pupils. She has been directly transferred to intensive care

unit from the operating room after the surgeons inserted bilateral chest drainages for hemopneumothorax and an intracranial pressure monitoring device. A computed tomography (CT) scan of the head and body revealed a subdural haematoma with cerebral concussion and effacement of the right ventricle, right temporal bone fracture, toraco-abdominal concussion with costal fractures and liver with a laceration path of 4.3 cm in the eighth segment.

On the intensive care unit, the patient has been monitored and received respiratory and vasopressor support, analgesia, hydro-electrolytic and acid-basic rebalancing, blood replacement therapy, cerebral depletion and diuretics, stress ulcer prophylaxis, antibiotics and deep vein thrombosis prophylaxis.

After evaluating the patient and the CT scan, the neurosurgeon concluded that the patient would not benefit from surgery and the injuries are most probably unsurvivable.

Neurology was consulted for brain death evaluation, and the neurologist ordered an EEG and an apnea test. Both EEG exams and apnea test revealed no brain activity and absence of the respiratory movements, so brain death has been confirmed.

The unit care team made a referral to the local organ procurement organization and discussed with the family about organ donation.

The family agreed with organ donation (liver, kidneys, pancreas, spleen and cornea), so the organ recovery coordinator and the unit care team announced the forensic pathologist on duty about the case.

The forensic pathologist examined the patient and all the medical records and agreed with the organs donation, except the liver, because there was a suspicion that the liver concussion might have played a part in the cause of death.

The autopsy revealed a rupture of 3/0.2/2.5 cm deep on the diaphragmatic face of the right lobe of the liver (Figs 1-4). The cause of death was due to the traumatic and hemorrhagic shock as a consequence of a complex trauma.

In this case, the forensic pathologist refusal to accept the liver sample for organ transplantation was due to the lesions detected by the CT examination and the suspicion that the traumatic injury at this level could be related to the causes of death. Even if the head injury was severe and incompatible with life, the other traumatic lesions also contributed to the cause of death, i.e. liver rupture followed by an internal bleeding.

Figure 1. The visceral face of the liver.

Figure 2. The diaphragmatic face of the liver.

Figure 3. The rupture of 3/0.2/3.5 cm.

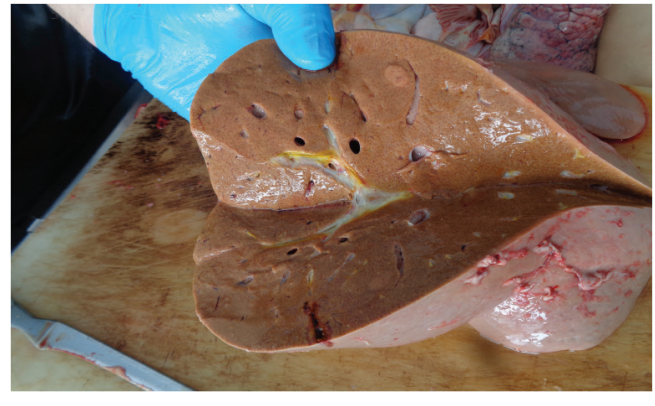

Figure 4. Section of the liver.

DISCUSSION

Currently, there is no statistical data available related to judicial refusals for organ procurement surgery in Romania. In order to raise the awareness about the real number of potential organ transplants that were denied, there is an imminent need for these statistics to be accomplished.

One of the most common causes of brain death with forensic involvement is represented by severe cerebral trauma usually following road traffic injuries, gunshot wounds, fall or blow to the head.

According to Romanian legislation, for judicial reasons, in the event of forensic deaths, organ procurement is absolutely prohibited in cases of homicide. In other circumstances of violent deaths with forensic involvement, such as road traffic injuries, procurement in order to facilitate organ transplantation can be considered after the forensic pathologist has performed an examination and provided the harvesting would not harm in any way the course of the subsequent autopsy and the further investigation.

The forensic report consists not only of autopsy findings and conclusions regarding the manner and cause of death, but also clarifies the forensic causality chain between the traumatic event and exitus.

Determining the causality chain is crucial in the aftermath of a criminal act and may be influenced by several external factors e.g. complications that may arise due to treatment and the time spent in the intensive care unit.

Moreover the forensic pathologist may be required to provide expert testimony in cases that go on trial. In this situation, information about the shape of the wound or its depth may indicate the type of the weapon or the penetration force. In very complex homicide cases, testifying in court would be rather difficult for the forensic pathologist if the autopsy would be performed after the organ procurement surgery. However the presence of the forensic pathologist in the operating room during procurement can be very useful in selected cases since any possible trauma signs or lesions in form of bruises or capsular tears that would be present on the surface of the organs could be macroscopically better assessed and documented. A detailed medical report should be written by the transplantation team, contributing this way to a better comprehension of the autopsy.

Although blood and urine samples can be collected for toxicology right before surgical procedure, some cases may require the extended version of toxicology exam i.e. microscopy samples from liver and kidney. This would interfere with the forensic approval for organ procurement.

Blunt damage of internal organs may occur without a mark on the skin, therefore this fact could be disregarded at a simple examination performed on the intensive care unit short before organ procurement surgery. In order to avoid such situations, the judicial authorities should make contact with a forensic pathologist as soon as possible, as the objective of the forensic examination is to document all the relevant forensic data and to make himself familiar with the specific intensive care applied treatment.

In conclusion, one of the greatest problem with losses of organ donors arises due to the refusal of the forensic pathologist for the organ procurement, fearing that the organ harvesting may change the result of the autopsy.

In order to increase the number of potential organ donors, a strong interdisciplinary communication between judicial authorities, forensic pathologists and transplantation team is paramount.

A well-established protocol for organ procurement and transplantation cases, in which the death occurred as a result of a violent cause, could mitigate the forensic doctor's investigation, hence the approval or denial of surgery could be better assessed.

Conflict of interest

The authors declare that they have no conflict of interest.

Acknowledgment

We would like to express our special thanks to Professor Dr. C.G. Curca for supervising our work, guidance and useful critiques. We would also like to thank Dr. Iulia Diac for her advice, assistance and for contributing to the idea of this article.

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