

THE ROLE AND IMPORTANCE OF AUTOPSY – A PRACTICAL AND ETHICAL APPROACH

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Abstract: *This article's aim is to raise a "red flag" regarding the risk that autopsy, as a medical practice might remain just a "legend" of medical science history. Many authors that studied the subject and express their concern for the dramatic continuous drop in autopsy rate worldwide highlight this aspect. Autopsies allow us to confirm, to clarify or to correct clinical diagnosis established ante mortem, this way enabling physicians to improve their own medical knowledge. Analysis of autopsy results are normally used to teach and better prepare medical students and medical staff, contributing to increase quality of medical healthcare.*

Keywords: *autopsy, diagnosis consistency, death, consent, ethics.*

1. Introduction

Autopsy (post-mortem examination, necropsy) is a normal, current medical procedure performed in a surgical manner, through which a thorough check of tissues and organs of a human body after death, aiming at determining the cause of death, of mechanisms that lead to that outcome, shortly said tanatogenesys [7].

2. Role of autopsy

Advantages and benefits of autopsy are numerous and with long-term effect. Though interrelated, these can be classified in benefits for medical practice, for deceased's families and for society.

Autopsies allow doctors to correct, clarify and confirm ante-mortem clinical diagnosis; this way physicians may improve their own medical knowledge, can train their ability for diagnosis and apply

these knowledge into future practice [9]. Results of a British study show that an increase in autopsy rate lead to a higher rate of accurate clinical diagnosis [4].

Only through autopsy one can determine in detail morphological, topographical conditions, allowing correlating clinical and anatomical aspects. Data obtained through means of autopsy are important not only because it establishes clearly the main cause of death, but also can clarify associated pathology, treatment response and disease evolution.

The goal of an autopsy is not to highlight clinicians' mistakes and judge them, but to inform and help clinicians learn from mistakes and improve medical future practice in favour of next patients.

Although technological means of investigations are continuously improving, the rate in diagnosis error did not decrease [15]. In spite of efficiently using CT scans and MRI many authors claim that they

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can't substitute autopsy, nor decrease their value [11].

Obviously, a 100% accuracy of diagnosis rate would be unrealistic in spite of the new, wide range of new diagnosis tools and technologies. The goal of autopsy is first to help through constructive feed-back and reach a minimal acceptance rate of errors in diagnosis. For example, in a study based on checking through autopsy of CT investigations there were reported 13.9% false-negative cases, and another study there were 4.4% errors reported in cases that were investigated through modern means including computerized image techniques. These said, there is a need for experience in correlating MRI results with autopsy results, before trying to establish cause of death through MRI al in to these.ne. Medical practice shows that new pathological processes occur, not fully understood yet, new unknown diseases prior death, and only autopsy can bring light into these [9].

Also, autopsies can provide essential information regarding atypical manifestation of diseases, information that can't be obtained from living subjects; also, we can evaluate the efficiency of new surgical techniques, new medicine and their potential adverse effects, of specific therapy effects (irradiation), and better support and care for people affected by cancer and its' treatment, this way improving their surviving rate.

Autopsy results can help environmental investigations, life-style related diseases, cultural and geographical influences, and most important early detecting of chronic diseases and their long-term consequences.

Only through autopsy changes due to inhaling and ingestion of chemicals or pollutants from the environment (soil, air, water), food additives and other range of chemicals used in modern industrial processes that can determine tissue or

organ changes, can be revealed [3].

Post mortem examination has the role of control mechanism for medical activity quality that impacts on clinical practice.

Improving quality of medical healthcare will decrease the number of malpraxis cases. Autopsy can help eliminate suspicions regarding professionalism and attitude of medical staff and exclude suspicions of "covering up" acts from medical institutions.

Medical education is from far the greatest beneficiary of autopsy, as it is a major valuable learning tool which helps understand basics of pathology, of aspects regarding uncertainties in clinical practice, of social and psychological issues related to death and necessity of high quality standard in medical healthcare.

Using autopsy in teaching activities helps medical students to understand and integrate knowledge and competencies in clinical activity, to understand and solve ethical and legal issues [1], [13].

Autopsies allow, respecting legal rules, harvesting and preserving fragments of organs and tissue that are essential for research activity. As for publishing medical research it is well known the fact that there are not enough studies confirmed through autopsies and this fact makes publishing sometimes difficult [9].

Regarding public healthcare policies, autopsy represents a tool for establishing cost/efficiency report and assessing how efficient resources are distributed.

Considering a wide range of diseases it is very important that distributing resources should be based on epidemiology studies, on death certificates and on statistic data about life. The accuracy of database, which is the starting point for these type of decisions, is in danger of being compromised by errors in death certificates which are not confirmed through autopsy [8].

Post-mortem examinations keep a spotlight in medical literature. Strange, despite of acknowledged importance, all over the world autopsy is in decline.

Different countries in different studies show the same thing: autopsies are losing ground and are trying to stop this decline by highlighting its' importance, benefits and by educating people in order to easier accept it.

In North America during the last 50 years autopsy rate dropped from 50% to 15%, while in UK it reached 10% even in teaching hospitals, or even lower.

Sweden 31% in 1993, Belfast 18% in 1990, Northern Ireland 8% in 1994 [6], [14].

Autopsy is one of the main tools in medical evolution. Its' decrease as a medical practice can be attributed to a number of factors like: fear of legal consequences in case of diagnosis error, caretakers' refusal to accept autopsy of the loved one, fear of contamination from pathologists, it is a time and money consuming procedure. Regardless of the huge progress registered by medical science, differences between clinical diagnosis and autopsy cause of death remind relatively constant in the last 50 years, no matter what type of hospital or type of patient [2], [5], [6].

3. Material and methods

In order to back-up what was stated above, we present a study that analyses the dynamics of autopsy performed.

Objectives: evolution of autopsies performed each year, between 2006-2013 and accuracy of clinical diagnosis vs autopsy findings.

Our study was executed using a thorough retrospective analysis of the number of deceased registered in Clinical Emergency County Hospital Brasov, over a period of 8 years.

Data were gathered from the following hospital files:

- registry records of deceased in the hospital
- registry records of post-mortem examinations
- duplicates of death certificates covering the above period.

We registered:

- the total number of deceased/year correlated with the number of hospital patients
- the total number of death certificates released by Pathology department, and separately cases where autopsy was performed
- studied accuracy of clinical diagnosis vs autopsy findings regarding cause of death.

4. Results and Discussion

As one can see in Table 1 in the 8 years of study the hospital had a total of 9412 deaths, 859 death certificates were released (CCD) from which only for 287 cases the autopsy was performed, while for the rest 8519 it didn't.

Out of the total of 9412 cases of death were for the forensic department and were not included in this study as they are cases for criminal inquiries.

This study contains observations about only 287 cases that died in hospital and post-mortem examination was performed on them.

Table 1
Deaths , autopsies and death certificates (CCD) released over the period of study

YEAR	2006	2007	2008	2009	2010	2011	2012	2013
Total Admissions	48704	49125	49490	50699	48112	43741	39296	39447
Total Deceased	1187	1143	1132	1213	1175	1146	1180	1226
Total CCD:	1011	1004	979	1091	1089	1073	1122	1150
CCD with autopsy	78	52	50	39	18	18	14	18
CCD without autopsy	933	952	929	1052	1071	1055	1108	1132
CCD related to medico-legal	176	139	153	122	86	73	58	86

According to Table 2 we can easily observe that cases of death in hospital were mostly constant each year, with very slightly yearly variations.

Table 2
Autopsy number declines over the 8 years of study

	Deaths	CCD	With autopsy
2006	1187	1011	78
2007	1143	1004	52
2008	1132	979	50
2009	1213	1091	39
2010	1175	1089	18
2011	1146	1073	18
2012	1180	1122	14
2013	1226	1150	18

Footnote: CCD – death certificates

The same situation is with death certificates release, constant during the 8 years of study.

Unfortunately this is not the case with the autopsy number which has a negative trend over the last 8 years, as follows:

In 2006 out of 1011 deceased with death certificates only 78 (7.72%) were

autopsied; then in the following years the decline becomes more dramatic: in 2007 and 2008 we have only 52 (5.18%) autopsies and respectively 50 (5.11%), going towards 39 (3.57%) in 2009.

Starting with the years 2010 the situation goes constantly worse and between 2010 and 2013 autopsied cases tend to represent less than 2% from total numbers of deaths.

As can be seen in Table 3, if in 2006 post-mortem examinations were 7.7%, in the last 3 years of study, these cases barely go above 1%.

Table 3
Post-mortem examination percentage related to death certificates (CCD) and autopsies

	CCD	With autopsy	Percentage %
2006	1011	78	7.72
2007	1004	52	5.18
2008	979	50	5.11
2009	1091	39	3.57
2010	1089	18	1.65
2011	1073	18	1.68
2012	1122	14	1.25
2013	1150	18	1.57

Reasons for this severe decline are numerous and of different explanations:

- requests from caretakers not to subject to autopsy their loved one
- clinicians thought that the cause of death is “certain” due to extensive investigations with state of the art technologies during their stay in hospital as patients
- patients were known to suffer from long lasting diseases in terminal stages and autopsy was not considered to be must

Post mortem examination can raise a huge amount of debates. It is true that people are generally reticent when it comes to cutting open a dead loved one. Though we must ask ourselves if this reluctance is real and which are the reasons that support it. We face a lack of information amongst common people and even among medical practitioners regarding post-mortem examinations and mostly people do not understand benefits of autopsy for medical practice.

Table 4

Inconsistencies between clinical diagnosis and post-mortem cause of death

	2006	2007	2008	2009	2010	2011	2012	2013
CCD	1011	1004	979	1091	1089	1073	1122	
Auto psies	78 7.7%	52 5.18%	50 5.11%	39 3.57%	18 1.68%	18 1.65%	14 1.25%	18 1.61%
C	34 43.58%	17 32.69%	20 40%	16 41.02%	6 33.33%	6 33.33%	4 28.57%	5 27.77%
Nc	23 29.50%	20 38.46%	17 34%	12 30.77%	6 33.33%	8 44.44%	6 42.85%	10 55.55%
Cpd	14 17,94%	4 7,69%	9 18%	8 20,51%	2 11,11%	1 5,55%	3 21,42%	1 5,55%
Cps	7 8.97%	11 21.15%	4 8%	3 7.69%	4 22.22%	3 16.66%	1 7.14%	2 11.11%

Footnote:

CCD-death certificates; C-consistency between clinical and post-autopsy diagnosis

NC-inconsistency between clinical and post-autopsy diagnosis

Cpd-partially consistent: for main cause of death but not for all secondary diagnosis

Cps-partially consistent: for all secondary diagnosis but not for main cause of death

There are a series of preconceived ideas regarding autopsy procedures like fear of “mutilating” a dead body belonging to someone dear.

We can also debate over the lack of interest from medical community in persuading caretakers and inform them upon social and medical benefits of autopsy.

We continued our study analysing those 287 cases on which autopsy was performed and compared the clinical diagnosis with that obtained after post-mortem examination.

We must underline that the aim of this study is not to identify diagnosis errors, but to analyse strictly numerical consistencies and inconsistencies in diagnosis in order to

reveal the importance of post-mortem examinations from epidemiological point of view.

Required data were collected from necropsy registries where there are written both the clinical diagnosis and post-mortem diagnosis.

We identified 3 groups as follows:

- C-consistency
- NC- inconsistency
- Cp-partially consistent with 2 subgroups:
 - Cpd - direct consistency (main cause of death) and inconsistency for secondary causes (associated diseases)
 - Cps - secondary consistency (for associated diseases) and inconsistency for main cause of death
 - As we can see in Table 4, the number of inconsistencies between clinical diagnosis and post-mortem cause of death is more than significant as it is situated between 29.50% in 2006 and 55.55% in 2013, with a yearly average of 38.56% over the 8 years of study, without partial inconsistencies.

As we've mentioned before, the certainty of a death cause can be established only after autopsy is performed. Our analysis shows that diagnosis inconsistencies for the autopsied cases represent more than 30%, so we can't stop asking ourselves what happens if we expand this conclusion to all death certificates released without performing a post-mortem examination. Is it acceptable that 1/3-rd of death diagnosis inscribed in the death certificates are invalid as they are not confirmed through autopsy findings or represent errors in diagnosis? This question highlights a very important issue for the entire society: epidemiological database are filled in based on death certificates released with or without autopsy. If we accept that 1/3-rd of

death diagnosis are invalid (our conclusions are in line with many other studies from all over the world), than our national medical database is incorrect.

So, without the certainty offered by verifying data through post-mortem examinations we have no warranty that our strategies and resource allocation in medical policies are efficient and cost effective.

5. Ethical aspects for the relation between pathologist and clinicians

Even if the role of the pathologist should normally be regarded as any other's specialist role: one that can contribute in establishing a certain diagnosis, we noticed that this is not the case. The pathologist's activity and autopsies is co-related with possible malpraxis inquiry intended by the caretakers of the deceased.

In fact the role of the pathologist should be perceived as a part of the whole medical team and as a mechanism for improving individual abilities for understanding and approaching any disease.

Even if a series of patients' rights seem to become obsolete when in relation with the pathologist, reality shows that this is the one to protect the deceased rights, even though he obviously can no longer express his wishes.

Also, it is mandatory that the pathologist becomes the warrant for protecting patients' rights, even in death, such as confidentiality and private life for the deceased and its' family.

An unusual positioning has the pathologist vs patients' right for safe and secure treatment and healthcare, but, through examination and autopsy findings, he becomes the warrant that these rights had been respected.

As there is no longer possible to have an informed autopsy consent from the patient, this right is transferred to the caretakers

and the pathologist has to make sure all information and autopsy findings are used respectfully, preserving the image for the deceased as a former human living being.

The pathologist's autonomy is huge and it ensures the certainty of an accurate, unbiased diagnosis, in accordance with the data obtained during the micro and macroscopic examination.

The pathologist's activity must rely on strong, clear, high moral values and ethical principles and his professional independence is in fact the warrant for respecting the deceased human rights.

6. Conclusions

Many practitioners are not very familiar with autopsies and are not quite aware of its' benefits for the grieving families, for the now and future patients and for medical practice.

This study which is in line with the international point of view shows that autopsy's ascend and decline, the legal frame that regulates its' use, its' value for medical practice, study and for healthcare strategies and policies can't be indifferent to all of us.

Healthcare policies and strategies for reducing mortality caused by ordinary lethal diseases are based on accurate results in order to be efficient, so we must admit that the decline of autopsy as a medical hospital routine has to be stopped.

Autopsy findings can really help increase quality and standard of medical practice.

Autopsy is now considered to have a marginal usefulness in modern medical practice.

Here, we claim it is an essential medical procedure for the development, understanding and improving quality and accuracy in medical practice and healthcare system.

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