

MEDICO - LEGAL ASPECTS OF DEATH DUE TO SURGERY AND ANAESTHESIA IN LIBYA

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ABSTRACT:

In most jurisdictions, deaths that occur during or within a short time after surgical operation, invasive diagnostic procedure, become the subject of a medico-legal investigation. This retrospective study was performed on cases of death due to surgery and anesthesia to refine the medico-legal aspects. It tries to spot on serious medical neglecting or mistake during anesthesia and surgery. Forty subjects of both sexes were carried out in this retrospective study. This retrospective study was undertaken between January 2000 and December 2009 to refine medico-legal aspects of death

due to surgery and anesthesia. This study was carried out on cases of death due to surgery and anesthesia in the following places: Zawia city, Surman city, Sabratah city, Egeilat city, Gemail city and Zewara city. Our study revealed that, gynecological operations were the common and majority of cases died presented to hospitals seeking for delivery. Autopsy can also help to solving the conflict: when the family suspect that malpractice has occurred, they are unlikely to believe the explanations provided by the specialists to justify his management of the case and in this situation, an autopsy can restore trust and resolve conflicts by providing data viewed as objective by the family. In this situation, performing an autopsy can avoid litigation.

INTRODUCTION:

The malpractice premium for anesthesiologists was about as high as that of surgical specialties. However, due to the introduction of sophisticated monitoring devices, better training, understanding of the physiologic effects of anesthetics and better transmission of information concerning causes of anesthesia mortality, the mortality rate has fallen into the range of 5-6 deaths/million anesthetic administrations. At the same time, the malpractice premium has fallen close to the range of primary care physicians. One of the most common causes of death due to surgery is an inadvertent mechanical disruption of a vital organ. Most anesthetic-related deaths are caused by human error (inexperience and insufficiency), with the most common problems related to ventilation and an overdose of drugs. This could be caused by an error in dosage, ignorance of proper dosage, or carelessness (Warden et al, 1997).

In most jurisdictions, deaths that occur during or within a short time after surgical operation, invasive diagnostic procedure, become the subject of a medicolegal investigation. To be effective, such investigations must include an autopsy. The autopsy on a post-operative death is of limited value and may be difficult as a result of the surgical intervention and its sequelae. The morphological findings, especially in so-called 'anesthetic death', may be minimal or even absent. The pathologist must rely heavily upon clinical data and cooperation with other doctors (Saukko and Knight, 2003).

AIM OF THE STUDY:

Studying the death cases referred to the Medico-legal center of Sabrata (MLCS) for investigation due to surgery and anesthesia to determine the common causes and to recommend the preventive measures

MATERIALS AND METHODS:

PLACES OF THE STUDY:

The forensic service in Sabratah Judicial Area (S.J.A) is run by the Medicolegal Centre of Sabratah (MLCS) which provides both clinical and autopsy forensic services according to the judicial request. Death investigation in the MLCS involves the determination of the cause of death including medical malpractice deaths. MLCS provides services to the Zawia city, Surman city, Sabratah city, Egeilat city, Gemail city and Zewara city which hold populations of about 500.000 inhabitants. It covers a surface area of around 50.000 Km²

Data Were Collected From:

1. Medicolegal Centre of Sabratah (MLCS)
2. The public prosecutor in Zawia, Surman, Sabratah, Egeilat, Gemail and Zewara: records and medical files were collected and included in the present study.
3. Court (Zawia Court and Egeilat Court): records and medical files were collected and included in the present study.

SUBJECTS:

Forty subjects of both sexes were carried out in this retrospective study. This retrospective study was undertaken between January 2000 and December 2009 to refine medico-legal aspects of death due to surgery and anesthesia. All cases were autopsied within 24 hours of death.

The Record Included:

- 1) Descriptive information about the patient prior to admission and preoperative findings (Preoperative record sheet).

Forensic Record Sheet:

This sheet includes the autopsy record sheet. Autopsy performed after authorization from prosecutor. All autopsies were performed within 24 hours after the death, according to the same procedure in a single forensic institute (Sabratah judicial Office). The circumstances and the cause of death indicated by the physician in the charge of the patient (primary diagnosis) were abstracted from the patient's medical charts, as well as the result of autopsy diagnosis.

STATISTICS:

Data were collected and tabulated. Age, duration of anesthesia and postoperative duration until occurrence of complications were expressed as means \pm SD. While, age was analyzed statistically by Student's t-test for significant differences between males and females ages. Statistically significant was at P values more than 0.5. The SPSS Version 16.0 (SPSS, Inc., Chicago) package was used for all statistical analyses.

RESULTS:

This retrospective study was carried out on forty cases died due to anesthesia and surgery during the period from January 2000 to December 2009 in the area between Tripoli and boundaries of Tunis. The study was analysis some medicolegal aspects of death due to anesthesia and surgery.

Table 1: Distribution of studied cases according to their age:

Age (years)	No.	%
0-10	2	5
11-20	4	10
21-30	8	20
31-40	11	27.5
41-50	6	15
>50	9	22.5
Total	40	100

Table 2: Distribution of studied cases according to their sexes

Sex	No.	%
Male	16	40
Female	24	60
Total	40	100

Table 3: Distribution of studied cases according to their age and sex

Age (years)	Sex	
	Male	Female
0-10	1	1
11-20	3	1
21-30	2	6
31-40	2	9
41-50	2	4
>50	6	3
Total	16	24

Table 4: Distribution of studied cases according to nationality

Nationality	No.	%
Libyan	32	80
Egyptian	6	15
Nigerian	1	2.5
Tchadian	1	2.5
Total	40	100

Table 5: Distribution of studied cases according to type of hospital

Type of hospital	No.	%
Teaching (n=2)	18	45
General (n=4)	14	35
Private (n= 4)	8	20
Total	40	100

- **n:** number of hospitals

Table 6: Distribution of studied cases according to place of death

Place	No.	%
Operative theater	18	45
Recovery room	11	27.5
Intensive care unit	7	17.5
Outside the hospital	4	10
Total	40	100

Table 7: Distribution of studied cases according to surgical and anesthetic death

	No.	%
Surgical death	36	90
Anesthetic death	4	10
Total	40	100

Table 8: Distribution of studied cases according to risk factors including chronic diseases

Risk factors		No.	%
Heart diseases	Myocardial infraction	1	2.5
	Hypertension	6	15
	Chronic heart failure	1	2.5
Liver disease		3	7.5
Diabetes mellitus		5	12.5
Emergency surgery		19	47.5
None		5	12.5
Total		40	100

Table 9: Distribution of studied cases according to duration of anesthesia

Duration (min.)	No.	%
30-60	8	20
61-90	16	40
91-120	14	35
>121	2	5
Total	40	100

Table 10: Distribution of studied cases according to type of surgical specialty

Type of surgical specialty	No.	%
Gynecological	18	45
Gastrointestinal	12	30
Orthopedic	8	20
ENT	2	5
Total	40	100

Table 11: Distribution of studied cases according to degree of difficulty of operation

Operation	No.	%
Major	38	95
Minor	2	5
Total	40	100

Table 12: Distribution of studied cases according to time lapse between surgical interference and death

Time (Days)	No.	%
<1	12	30
1-5	18	45
6-10	6	15
>10	4	10
Total	40	100

Table 13: Distribution of studied cases according to causes of death as mentioned in autopsy report

Causes of death	No.	%
Leaks of bile	7	17.5
Rupture appendix	4	10
Embolism (pulmonary & amniotic)	10	25
Myocardial infraction	1	2.5
Rupture uterus	5	12.5
Acute tubular necrosis	3	7.5
Injury to main blood vesseles	6	15
Brain anoxia	4	10
Total	40	100

Table 14: Distribution of studied case according to the presence of histopathological examination

Histopathology	No.	%
Done	3	7.5
Not done	37	92.5
Total	40	100

Table 15: Distribution of cases according to classification of American Society of Anesthesia (ASA) for death during surgical procedures

Class	Male		Female	
	No.	%	No.	%
ASA1	14	87.5	15	62.5
ASA2	1	6.25	9	37.5
ASA3	1	6.25	Nil	---
ASA4	Nil	---	Nil	---
ASA5	Nil	---	Nil	---
Total	16	100	24	100

Table 16: Cause of death present in death certificate issued from hospital and in forensic report

No. of case	Cause of death as mentioned in medical report	Cause of death as mentioned in forensic report
1.	Hypoxia	Brain anoxia due to failure of intubation
2.	Hypovolemic shock	Rupture uterus
3.	Hypovolemic shock	Rupture uterus
4.	Unknown	Septicemia due to leaks of bile resulted from slip of clips after laparoscopic cholecystoectomy
5.	Hypovolemic shock	Injury to internal iliac vien
6.	Cardiopulmonary arrest	Septicemia due to rupture appendix
7.	Cardiopulmonary arrest	Septicemia due to leaks of bile resulted from slip of clips after laparoscopic cholecystoectomy

No. of case	Cause of death as mentioned in medical report	Cause of death as mentioned in forensic report
8.	Cardiopulmonary arrest	Brain anoxia due to complete obstruction of trachea
9.	Cardiopulmonary arrest	Pulmonary embolism after femer fracture repair
10.	Cardiopulmonary arrest	Pulmonary embolism
11.	Cardiopulmonary arrest	Injury to left femoral artery
12.	Postpartum haemorrhage	Rupture uterus
13.	Cardiopulmonary arrest	Injury to internal iliac vein during hysterectomy
14.	Cardiopulmonary arrest	Septicemia due to leaks of bile resulted from slip of clips after laparoscopic cholecystoectomy
15.	Unknown cause	Septicemia due to leaks of bile resulted from slip of clips after laparoscopic cholecystoectomy
16.	Unknown cause	Septicemia due to leaks of bile resulted from slip of clips after laparoscopic cholecystoectomy
17.	Acute renal failure	Acute tubular necrosis
18.	Cardiopulmonary arrest	Brain anoxia due to completely obstruct of trachea
19.	Unknown cause	Myocardial infarction
20.	Cardiopulmonary arrest	Injury to left internal iliac blood vessels after laparscopic hysterectomy

No. of case	Cause of death as mentioned in medical report	Cause of death as mentioned in forensic report
21.	Unknown	Septicemia due to rupture appendix
22.	Hypovolemic shock	Injury to uterine artery
23.	Acute renal failure	Acute tubular necrosis
24.	Hypovolemic and neurogenic shock	Rupture uterus
25.	Sudden death	Pulmonary embolism
26.	Hypoxia	Brain anoxia due to inhalation of nitrous oxide instead of oxygen
27.	Sudden death	Septicemia due to leaks of bile resulted from slip of clips after laparoscopic cholecystoectomy
28.	Unknown cause	Septicemia due to rupture appendix
29.	Unknown cause	Amniotic embolism
30.	Unknown cause	Pulmonary embolism from deep vein thrombosis
31.	Cardiopulmonary arrest	Injury to internal iliac vein
32.	Hypovolemic shock	Rupture uterus
33.	Unknown cause	Amniotic embolism
34.	Unknown cause	Pulmonary embolism
35.	Sudden death	Septicemia due to rupture appendix
36.	Acute renal failure	Acute tubular necrosis
37.	Sudden death	Septicemia due to leaks of bile resulted from slip of clips after laparoscopic cholecystoectomy

No. of case	Cause of death as mentioned in medical report	Cause of death as mentioned in forensic report
38.	Unknown cause	Pulmonary embolism
39.	Unknown cause	Pulmonary embolism
40.	Unknown cause	Pulmonary embolism

Table 17: Distribution of studied cases according to court decision

Medical negligence	No.	%
Guilty	25	62.5
UngUILTY	4	10
Still not proved	11	27.5
Total	40	100

Table 18: Distribution of studied cases according to type of surgical specialty and opinion of court

Type of surgery	Total		Decision of court					
			Guilty		UngUILTY		Still	
	No.	%	No.	%	No.	%	No.	%
Gynecological	18	45	9	22.5	2	5	7	17.5
Gastrointestinal	12	30	7	17.5	1	2.5	4	10
Orthopedic	8	20	7	17.5	1	2.5	Nil	---
ENT	2	5	2	5	Nil	---	Nil	---

Table 19: Distribution of studied cases according to degree of punishment

Court decision	No.	%
Guilty with imprisonment	6	24
Guilty without imprisonment	19	76
Total	25	100

DISCUSSION :

Indication, performance and outcome of surgical interventions may substantially depend on the grade of peri-operative risks which is composed by surgical and anaesthesiological factors. Due to improved surgical techniques and peri-operative anaesthesiological care, mortality and morbidity rates have been considerably reduced in elective as well as in emergency surgery¹. Elderly patients had a higher rate of major peri-operative complications and mortality after non-cardiac surgery. Most geriatric patients had more than one system or one organ dysfunction before operation². In contrast, children over 5 years of age, postoperative nausea and vomiting were very frequent, with about one-third of the children experiencing this problem³. Sorensen et al., 2007 demonstrated that mortality within 30 days after surgery is five times higher after emergency than elective operations. Major and minor postoperative complications occur two to three times as often in emergency surgery. Females were at a higher risk than males for the third, fourth and fifth decade. Koch et al⁴ found that, female patients have an increased incidence of complications and mortality after surgery. Preoperative evaluation is an extremely important step in the efforts to decrease postoperative morbidity

and mortality in patients undergoing surgery⁵. The present study demonstrated that, emergency operations, hypertension, diabetes mellitus, liver diseases, myocardial infarction and chronic heart failure were the risk factors among the studied cases. Peders et al⁶ found that, there were five significant preoperative predictive variables: age; patients with history of chronic heart disease, and renal disease; emergency surgery; and the type of operation.

Risk of death increases with the duration of anesthesia and surgery time. Jaffer et al⁷ demonstrated that, longer duration of anesthesia predisposes patients undergoing surgery to venous thrombo-embolism.

Death associated with anesthetic procedures is rare, 1-4 deaths per 10,000 anesthesia's. This is probably due to the low incidence of anesthesia related death. The most common causes of anesthesia related deaths are: 1) circulatory failure; 2) hypoxia and hypoventilation, 3) anaphylactoid reactions including malignant hyperthermia, and 4) human negligence such as lack of vigilance or errors in the administration of drugs and in the maintenance and control of the anesthetic equipment⁸.

The majority of cases developed complications within the first 48 hours 82.5 % (n=33). Goldman et al⁹ found that, a significant correlation is reported between prolonged hospitalization and incorrect diagnosis. Contrary to literature, the medical malpractice rate was higher in patients with prolonged hospitalization. Deficiencies in diagnosis, failure in attempted interventions, lacking of necessary consultations, or not referring to other medical institutions may explain this discrepancy. These data coincided with study of Pakis et al¹⁰. It is not uncommon in Libya for pregnant women to have had more than three Caesarean sections. However, in this study and Khurshid et al¹¹ found that, increased frequency of uterine

rupture was observed in cases having history of previous one cesarean section. The probable reason could be that most of these cases were emergency cases thus establishing a possible association between emergency cases and increase risk of complications.

The histopathological examination of lesions seen macroscopically is regarded by most pathologists as an integral component of the autopsy¹². Failure to undertake histological examination was noted as a substantial deficiency in 28% of reports analyzed by NCEPOD in 2002 and, in that year, the Royal College of Pathologists recommended that histology examinations should be done on all major organs and any identified lesions, provided sufficient consent has been obtained. Nonetheless, histology plays an important part in the confirmation or refutation of autopsy diagnoses. Diagnoses made only after histology account for up to 23% of unexpected autopsy diagnoses¹³.

CONCLUSION :

Premorbid factors, chronic diseases, preoperative condition of the patient, operative factors, and the surgeon's level of training all predict a poor surgical outcome. Gynecological operations were the common and majority of cases died presented to hospitals seeking for delivery. Most of cases died postoperatively after serious complications. Autopsy can also help conflict solving: when the family suspect that malpractice has occurred, they are unlikely to believe the explanations provided by the specialists to justify his management of the case and in this situation, an autopsy can restore trust and resolve conflicts by providing data viewed as objective by the family. In this situation, performing an autopsy can avoid litigation.

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