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Original Article

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Deaths related to liposuction in Brazil

Mortes relacionadas à lipoaspiração no Brasil

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ABSTRACT

Introduction: Liposuction is one of the most performed cosmetic surgeries in the world. Its mortality varies from 2,6 (6) to 19 (7) deaths/100 thousand. Data were obtained through questionnaires from medical societies (4-10) and retrospective data from forensic medicine institutes. However, both methods present flaws: the first due to professional bias and information duplicity, and the second due to the lack of data on the cause of death.

Objectives: To identify the number and causes of liposuction deaths through documentary records of news published in the press and study of death certificates.

Methods: This is a documentary, descriptive-quantitative study. Knowing the deceased patients' names and the cities where the death occurred, we obtained death certificates from the civil registry offices.

Results: We surveyed 102 deaths and 86 death certificates. Pulmonary thromboembolism was the most cited cause of death in 17.44%, 45% on the same day of surgery. 53.6% of surgeries were performed in hospitals, and 61.76% of them, alone.

Most physicians responsible for the surgeries were plastic surgeons (74%). Still, none were registered as a specialist in Dermatology at the Federal Medical Council. In 12.98% cases, doctors who participated in the surgery filled out the death certificate.

Limitations: The ethical impossibility of accessing medical records and the inadequate filling of death certificates.

Conclusion: *The compulsory notification must be established by law to create a database to help develop guidelines for the prevention of these deaths.*

Keywords: Liposuction; dead.

RESUMO

Introdução: A lipoaspiração está entre as cirurgias estéticas mais realizadas no Mundo. Sua mortalidade varia; 2,6 (6) a 19 (7) mortes/100 mil. Dados são obtidos por questionários a membros de sociedades médicas (4-10) e retrospectivo, obtidos em IML, (3, 11) ambos falhos. O primeiro pelo viés profissional e duplicidade, o segundo pela falta da causa mortis.

Objetivos. Identificar o número e causas das mortes relacionadas à lipoaspiração por registros documentais das notícias veiculadas na imprensa e estudo das certidões de óbito.

Métodos. Estudo documental, descritivo-quantitativo. Com a ciência, dos nomes e cidade do óbito, obtivemos certidões nos cartórios civis.

Resultados. 102 mortes e 86 certidões de óbito. Tromboembolia pulmonar foi a causa mortis mais citada em 17,44%, 45% no mesmo dia da cirurgia; 53,6% realizadas em hospitais e 61,76% isoladas. Especialidade dos médicos responsáveis: cirurgião plástico (74%), None registrado na qualificação de especialista em dermatologia no CFM. 12,98% dos atestados preenchido por médicos que participaram da cirurgia.

Limitações. A impossibilidade ética no acesso aos prontuários médicos e o preenchimento inadequado das certidões de óbitos.

Conclusão. *A notificação compulsória deve ser instaurada por lei para formação de um banco de dados que auxiliará na construção de diretrizes para prevenção desses óbitos.*

Palavras-chave: Lipoaspiração; morte

INTRODUCTION

Liposuction is the medical-surgical procedure for treating the accumulation of superficial adipose tissue that damages the body silhouette. Aspiration is done through cannulas connected to the vacuum pump (sucker) or syringe, which generate negative pressure.^{1,2}

From 2011 to 2020, liposuction ranked among the first positions of the most performed cosmetic surgeries globally, with more than one million surgeries performed each year.

The number and causes of death, of young and healthy patients in general, are not well established.^{2,8,10}

We believe that surveying the number of deaths through the news published in the press is a more effective method than sending questionnaires to members of medical societies or retrospectively studying legal medical records. The latter have deficiencies, such as the bias of responses and the lack of data on death certificates for reliable analysis. The data obtained may contribute indirectly to the establishment of prophylactic measures. Thus, this work aims to verify the incidence of causes of death from liposuction and to identify other variables that may be related to them.

METHODS

This is a documentary, descriptive-quantitative study, approved by the Ethics and Research Committee of UNIFESP-EPM (CEP 542.458) from 1987, the date of the first death from a liposuction surgery in Brazil, until September 2015.

We used news from the media to raise the number of deaths related to liposuction in Brazil in this period, from the first news of death after liposuction to when 100 reported cases were exceeded. Our databases were news written in the largest printed newspapers and analysis of the leading news portals on the World Wide Web.

The press generally reports the victim's name and surname, sex, age, marital status, local of the surgery institute, and surgery and death dates. With this information, together with the civil registry offices, we obtained death certificates. These documents allowed us to confirm the variables acquired by the

press and to recognize other data such as color, causa mortis (reflected in the death certificate filled out by a medical professional), and the name of the professional involved. Data were also collected regarding sex, age, color, marital status, surgery and death dates, local of the surgery institute, and the cause declared by the sources (death certificate and press). Subsequent consultations on the websites of medical councils and societies allowed us to know the specialty of the doctor who performed the surgery.

RESULTS

We surveyed 102 cases of death related to liposuction between January 17, 1987, and September 15, 2015. Also, we obtained 86 death certificates (84.31%) from civil registry offices.

Women represented 98.04% of these 102 patients. The age varied between 18 and 62 years. The age group between 31 and 40 years represented 40% of the cases (Table 1).

Death on day zero (day of surgery) occurred in 45% of cases. When considering death between the day of surgery and the end of the first week (D7), this value increased to 82.82%; from the second week to the 28th day, 13.13%, and after the first month, 4.04% (N=99). It was possible to identify 97 institutional sites that performed the surgeries. Hospitals performed 53.6% of surgeries, and clinics outside hospitals conducted 46.4%. The association of liposuction with other procedures occurred in 38.24% of cases, while 61.76% of cases reported liposuction performed in isolation.

Regarding the specialties of the doctors involved, we were able to detect them in 86 cases. Of these, 66 doctors had a registered specialty, 61 in plastic surgery, two in general surgery, two in orthopedics, one in diagnostic imaging; 20 professionals had not registered any medical specialty; and 13.64% of doctors were involved in more than one surgery that resulted in the patient's death.

Of the causes of death, thromboembolism ranked first with 17.44%, followed by perforation (13.95%), infection (9.3%), hemorrhage (5.81%), fat embolism (4.65%), and acute lung ede-

TABLE 1: Data obtained by information from the media and death certificates

		N
Sex	Women: 98%	102
Age	Between 31 and 40 years: 40%	102
Death on D0 (surgery day))	45%	99
Death between D0 and D7	82,82%	99
Death after D30	4,04%	99
Surgeries in hospitals	53,6%	97
Isolated liposuction	61,76%	102
Specialty with the highest number of deaths	Plastic surgery	86
Number of cases in which the surgeon signed the death certificate	12,98%	86
Doctors who were involved in more than one death	13,64%	86

ma and anesthetic complications, with 2.32% each (N=86). In 44.18% of the cases, it was not possible to determine the cause of death.

DISCUSSION

Death resulting from liposuction is a misfortune in public health.³ The lack of knowledge of its causes prevents us from having reliable data to elaborate protocols that can prevent it.

The sample found in the studies previously conducted is related to the difficulty in obtaining data regarding deaths. In the literature, we found two methods to obtain this information: questionnaires sent to members of medical societies, usually plastic surgery societies,⁴⁻¹⁰ and the retrospective study of data obtained from a legal medical institute.^{3,11}

The method that used sending questionnaires was criticized⁷ for the possibility of biased responses. It is reasonable to assume that the doctor did not answer or omit data, as he can use the legal benefit of not producing evidence against him. The low response rate observed in most of these studies confirmed this hypothesis.^{4-6,9,10} This type of result is expected since the doctor involved has the right not to present evidence that could harm him. Retrospective studies^{3,11} of data obtained in legal medical institutes are also deficient, as the surgical procedure involved is often not mentioned, hindering the ability to identify deaths related to liposuction.

Because they are impactful news, deaths due to liposuction are widely reported in the press and generate enormous concern in gyms and medical councils. Based on this fact, the present study was initiated, which searched for news published in the printed and digital media and subsequently analyzed public documents.

With this methodology, we found 102 deaths related to liposuction, the largest sample among the scientific literature studied⁴⁻¹⁰ (Box 1). The analysis of death certificates prevents the same case from being included two or more times, as can occur in studies using questionnaires that can send it to two doctors who participated in the same surgery.

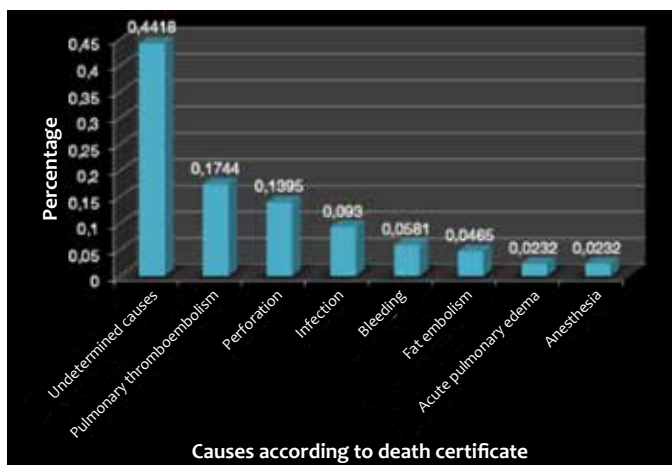


FIGURE 1: Relative number of causes according to death certificates

As this surgery is performed more frequently on women, the majority of deaths found were among women (98.04%) and among young people (97.05%), similar to data from the International Society of Aesthetic Plastic Surgery (84.9% of the patients submitted to liposuction in 2017 were women). These patients were healthy and underwent elective surgery expecting to remain in good health.

Regarding the reason for deaths, there are differences when consulting the literature. In the present study, it was impossible to establish the cause of death in 44.18% of the cases (undetermined). Thromboembolisms occurred in 17.44% and infection in 9.3% of cases.

The unknown cause also ranked first place in the Grazer and Jong's study,⁷ with 28.5% of cases, and ranked fifth in the Lehnhardt et al. study,⁹ with 4.35%.

Regarding the known causes, when compared with the Grazer and Jong's study,⁷ (method used: questionnaires sent to doctors), the order of the first two causes coincides: thromboembolic phenomena are the first, with 23.1%, and perforation is the second, with 14.6%. The leading causes of death in Lehnhardt et al. study⁹ are infection as the first cause, with 65%, perforation as second, with 13%, followed by thromboembolic phenomena in the third position, with 8%.

But we must take care when interpreting the data. Cui-pello et al.¹⁰ stated that their data should be interpreted with caution, as the study included many missing responses. Unknown death cause ranked last place in Lehnhardt et al. study.⁹ However, even with the support of several medical societies and sending three thousand questionnaires, only 23 cases of death were recorded.

Hughes⁸ reported an alarming increase in the mortality rate when liposuction was performed concurrently with abdominoplasty compared to when it was performed alone, with one death in 3,281 surgeries versus one death in 47,415 surgeries, respectively. Combining these surgeries or large volume liposuction can play an essential role in the causes of death. We did not find the same result. The number of deaths found in liposuction performed in isolation, declared in media interviews by members of the surgical team, was 61.76%.

Our study showed that the critical period in liposuction surgeries is the first week after surgery, especially the first day (45% of patients died on the day of surgery and 82.82% on the first week). We believe that this data demonstrates the importance of care in the 24-hour postoperative period and the first week, with more frequent reevaluations.

For the 102 cases investigated, there was no evidence of deaths occurring with the use of tumescent local anesthesia, as described by Klein.¹⁶ There was also no mention in the death certificates of lidocaine poisoning as a cause of death or process that led to it. Klein's technique is safer because the patient under local anesthesia still has a pain reflex and feels pain if the cannula touches the muscular fascia. It avoids the possibility of muscle perforation, which can occur when the cannula is not placed in the appropriate place. Also, the rate of blood depletion using this technique is significantly lower.

Box 1: Studies related to deaths in liposuction surgery

Authors	Year	Methods	Source	Deaths	
Grazer e Goldwyn ⁴	1977	Retrospective observational study	Questionnaires to members of specialty society	17	
Pitman and Teimourian ⁵	1985	Retrospective observational study	Questionnaires to members of specialty society	0	
Teimourian and Rogers ⁶	1989	Retrospective observational study	Questionnaires to members of specialty society	15	
Rao et al. ³	1999	Survey of medical records	Legal medical reports	05	
Grazer and de Jong ⁷	2000	Retrospective observational study	Questionnaires to members of specialty society	93	
Platt et al. ¹⁵	2002	Case report	Legal medical reports	03	
Coldiron et al. ¹²	2005	Retrospective observational study	Compulsory notification	05	
Lehnhardt et al. ⁹	2008	Retrospective observational study	Questionnaires to members of specialty society	23	
Avelar et al. ¹¹	2010	Survey of medical records	Macroscopic reports	07	
Starling et al. ¹³	2012	Retrospective observational study	Compulsory notification	10	
Cupello et a. ¹¹⁰	2015	Retrospective observational study	Questionnaires to members of specialty society	40	
Present study	2018	Documentary descriptive quantitative study	Media	102	
Authors	Causes (1st)	Associated surgery	Time of death	Local	Specialty
(4)	P.T.				
(5)	None				
(6)	P.T.				
(3)	Anesthesia intoxication		D0		Plastic surgeon
	E.P. (trombo ou gordura)	Maioria associada		Con-sultório	
(7)	Unknown	Most associated	D0	Doctor's office	
(15)	F.E.				
	Desconhecida	Maioria associada		Con-sultório	
(12)	P.E. (thrombus or fat)	Most associated		Doctor's office	

Quadro 1: Estudos relacionados a óbitos em cirurgias de lipoaspiração

Authors	Causes (1st)	Associated surgery	Time of death	Local	Specialty
(9)	Infection	Most associated		Doctor's office	
(11)					
(13)	T.P.			Doctor's office	
(10)	Unknown	Most associated		Doctor's office	
Present study	Unknown	Not associated	D0	Hospital	Plastic surgeon

P.T.: Pulmonary thromboembolism, F.E.: Fat embolism, P.E.: Pulmonary embolism, D0: Day of surgery.

Compulsory notification of cases would favor the creation of a database. This notification must document the detailed study of the surgery (technique performed, anesthesia used, amount aspirated, etc.), the preoperative health status, and the postoperative complications that led the patient to death. Also, it must be accessible so that committees can establish guidelines for death prevention in cosmetic surgery.

It is crucial that public health authorities develop strategies to identify deaths related to aesthetic procedures and that these cases undergo necropsy (including toxicological tests).¹⁴ The data obtained will assist in the establishment of preventive measures. In the United States, Florida's and Alabama's governments determined the obligation to report complications occurring in extra-hospital surgical procedures.^{12,13} Our study could only find data such as the type of anesthesia used in these surgeries by consulting patients' medical records and confidential documents.

Future studies with the records of these victims may clarify the gaps left in the present study. A standard access to medical records by medical researchers, with all ethical and legal rigor,

will undoubtedly benefit public health.

The search for ways to best fill out death certificates can mean an improvement in the system, functioning, and knowledge of the real causes of deaths. It would allow us to be more efficient in preventing deaths.

We believe that the compulsory notification of complications by cosmetic procedures can act prophylactically against damage to individuals' health, families' suffering, and expenses in the health system.

CONCLUSION

The search for deaths related to liposuction reported in the media is a tool that adds to the other methods available in the literature. Among the 102 cases studied, thromboembolism was the most cited cause of death, and most deaths occurred in the first seven postoperative days. There was no relationship between fatalities and the performance of more than one procedure in the same surgery or the place where the surgeries were performed. ●

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