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Original Research Paper

Plastic Surgery

AUTOLOGOUS TRANSFUSION IN LARGE VOLUME LIPOSUCTION. COHORT FOLLOW-UP.

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ABSTRACT **INTRODUCTION:** With the increased knowledge about the physiology of liposuction, procedures that involve larger body surface area are now being performed, which means an increased risk of hemorrhage and the need for transfusion. Homologous blood transfusion poses well-known risks, prompting the use of alternative and safer techniques such as autologous donation. **OBJECTIVE:** To demonstrate the utility of autologous transfusion in a cohort of patients undergoing large volume liposuction. **METHODS:** Observational, retrospective and longitudinal cohort study in patients undergoing liposuction, in the period 2017-2021. Autologous donation was performed one month and two weeks prior to surgery, ensuring that all patients were prescribed medication and prophylactic dietary measures to avoid hemoglobin depletion. **RESULTS AND CONCLUSIONS:** 40 files of women between 26 and 46 years of age, with a body mass index between 24 and 30 m/kg2 and a median aspirated volume of 6.3 Lt were analyzed. Quantified bleeding averaged 675 cc. Both initial hemoglobin and hematocrit had statistically significant differences with values in the postoperative period (p 0.001), in all. However, vital signs remained stable and no transfusion-associated adverse events occurred. Autologous transfusion is an excellent strategy for the management of bleeding in large volume liposuction.

KEYWORDS : Large volume liposuction, autologous donation, Cosmetic surgery, Safe blood.

INTRODUCTION

Liposuction is one of the most frequently performed aesthetic procedures. Initially, when liposuction was proposed as a body contouring surgery, its main objective was to remove localized body fat deposits, which was sufficient to meet the beauty standards of the time (1). With the greater knowledge of the physiology of liposuction, it has been possible to perform liposuction covering more areas. A greater change in the body contour has been achieved, evolving the technique to liposculptures of total body contour, always having as a previous concept that liposuction is not a standard treatment for the obese patient (2). Liposuction can be classified into two types, according to the volume aspirated: 1) large volume (>4 liters of aspirate) or 2) low volume (< 4 liters of aspirate). Therefore, we must always keep in mind that the greater the volume aspirated, the greater the risk of complications, especially hemorrhage (3). Consequently, in elective surgery, all possible scenarios must be foreseen, and in relation to large volume liposuction, safe blood must be available, considering its possible trans-surgical use. Public fear of transfusion-transmitted diseases, particularly human immunodeficiency virus (HIV), has led to an increasing demand by patients to have their blood drawn and banked for elective surgery, thus eliminating all risks of infection or immunization to donor antigens (4). Early/late complications can occur during blood and blood product transfusions, despite all the evidence and current precautions taken in this regard (5). In addition to these complications, there may be several problems to solve, such as a limited number of donors, transfusion-related infections and high costs (6). The advantages of preoperative autologous transfusion are several, and it has been considered the most viable and safe option for elective surgery, it is useful when multiple antibodies are present or antibodies against high-frequency antigen. Finally, another characteristic not often mentioned, is its acceptance by some religious cults that usually do not allow blood transfusions (7). The aim of this study is to present the results of our experience using autologous transfusion in a cohort of patients undergoing large volume liposuction.

MATERIAL AND METHODS

This is a cohort, observational, retrospective and longitudinal study, performed at the "Naranjo Plastic Surgery" clinic in the city of Tijuana, Baja California, Mexico, where 40 files of patients who underwent liposuction were analyzed, in a period from January 2017 to March 2021. All patients were asked to come twice before surgery for blood donation (1 month and 2 weeks before), the aim was to have at least two units of blood before surgery. To ensure that the patients entered the best hematological conditions, they were prescribed Ferrous Sulfate and V.O. Folic Acid, in addition to a diet high in protein and iron. Folic Acid, V.O., in addition to a diet high in protein and iron. Upon admission to surgery, both hemoglobin and hematocrit were verified to be within normal values. High-volume liposuction was considered as that where more than 4 lt of adipose tissue were extracted and the pre and post surgical hemoglobin and hematocrit were analyzed as safety variables, as well as the evaluation of hemodynamic variations secondary to trans and post surgical hemotransfusion. The data were analyzed with the statistical

program SPSS ver. 25 in Spanish.

RESULTS

We analyzed 40 files of women who underwent high-volume liposuction, in the period from January 2017 to March 2021, with a median age of 34.5 years (q25-q75; 26-46.2) (Chart No.1). A median BMI of 26.7 (q25-q75; 24-30.2) was identified (Chart No.2). In relation to the aspirated volume, a median of 6.3 Lt (q25-q75; 5.5 - 7.1) was extracted and a bleeding that ranged between 550 and 800 cc (median= 675 cc) was quantified (Table No.1). All patients required blood transfusion, the number of globular packets administered was 1 in 25% of cases and 2 packets in 75% of cases. Vital signs in the trans-surgical period remained stable and there were no cases of secondary reaction to blood transfusion (Charts 3 and 4).

DISCUSSION

Liposuction is one of the most popular cosmetic surgeries worldwide. According to the latest data published by the British Association of Aesthetic and Plastic Surgeons in 2019, there was a significant increase in the number of men and women undergoing liposuction compared to 2017 (9% more) (8). In a meta-analysis by Kanapathy et al. (9) where they reviewed 23 articles involving 3,583 patients with an aspirate volume of 7.7 Lt on average, they report that the most common complication was blood loss with the consequent need for blood transfusion. In our study, the average aspirated volume was 6.3 Lt and blood transfusion was required in all cases. We have mentioned that the risks of homologous transfusions include allergic reactions, fever, viral infections and alloimmunization (10). To generate evidence for the use of autologous transfusion, Engle et al. followed a cohort of women who underwent radical hysterectomy for cervical cancer for 12.5 years (11). In this study, they compared an autologous transfusion group with a control group using homologous transfusion. 83% of the patients were alive after 12 years in both groups. The autotransfused group had one patient (3 %) who developed a secondary malignant neoplasm, a colon adenocarcinoma. The nonautologous group had two patients (5 %) who developed a secondary malignancy; one patient developed multiple myeloma and one patient developed a warty tongue cancer. Engle et al. conclude that the use of autologous blood donation is effective and safe for this type of patient. Patil et al. evaluated the benefits of intraoperative autologous transfusion in neurosurgical procedures (12), in this study 32 patients, men and women with an average age of 48 years, and were followed up. Coinciding with the results presented in our study, they found a postoperative decrease in hemoglobin and hematocrit derived from an average bleeding of 1,048 ml; however, stability in heart rate and mean arterial pressure was preserved. Finally, Patil et al. report no adverse events associated with autologous transfusion.

It is important to mention that few evidences have been found on the use of autologous transfusion in plastic surgery. However, it is pertinent to consider its use based on experience in other branches of surgery, especially in elective procedures, where maximum patient safety should be sought. Olaitan et al., present a preliminary report on the use of autologous blood in the plastic surgery unit of the National Orthopedic Hospital in Nigeria. In this kind of locality, the acquisition of homologous blood, besides representing immunological and infectious risks, represents a high cost, Olaitan et al. propose autologous donation as a safe and cheap means and suggest that it should be considered as a regular procedure in elective surgeries (13).

CONCLUSIONS

From the results obtained in this study, we can conclude that autologous transfusion is a very effective method to be used in case of major bleeding in high-volume liposuction. It is recommended to have a reserve of two blood units per patient and that the volume aspirated should be a maximum of 7.1 Lt. No adverse reactions associated with autologous transfusion were identified.

DECLARATIONS SECTION

- **Ethical Approval and Consent to participate:** All the patients who underwent the procedure gave their consent to participate in this procedure in autographic form
- **Consent for publication:** We have the consent of the study subjects to publish the results derived from this research.
- **Availability of data and materials:** All documents as well as the formats from which the information was obtained are available upon request from the editorial committee.
- **Competing interests:** The authors declare that they have no conflicts of interest
- **Funding:** The authors declare that they have not received any type of financing.
- **Authors' contributions:** JNDH, study design and execution of surgical procedures; CIAE, assistant in the execution of surgical procedures; LAVR, patient recruitment and supervision; ARM, methodological design; QLTS, data analysis and document writing.
- **Acknowledgments:** N/A

TABLE AND CHART LEGENDS

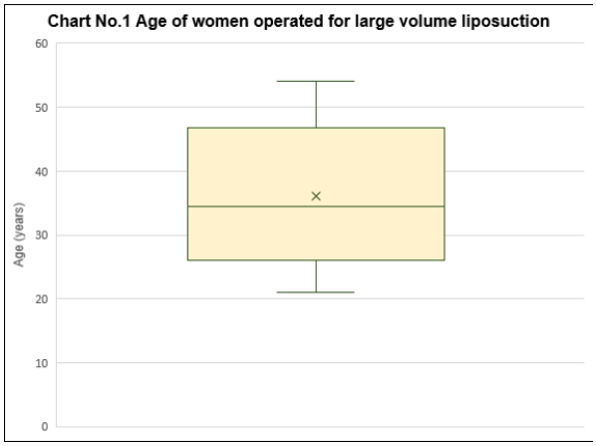

Chart No.1 Age of women operated for large volume liposuction

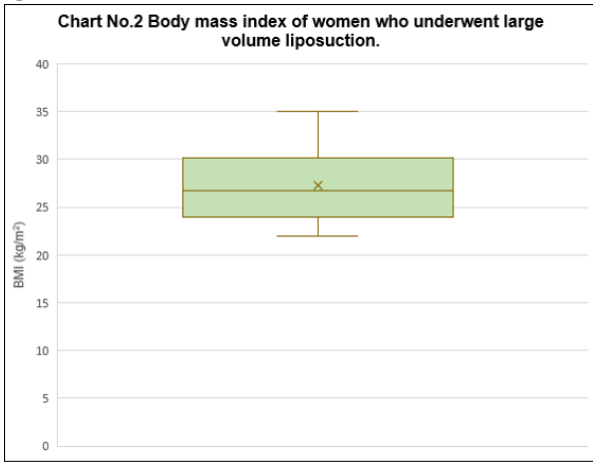

Chart No.2 Body mass index of women who underwent large volume liposuction.

Table No.1 Aspired Volume and Variation of Hb And Hto Post Surgery

TABLE No.1 ASPIRED VOLUME AND VARIATION OF Hb AND Hto POST SURGERY					
N=40					

	Median	(q25-q75)			
Aspirated volume (Lt)	6.3	5.5 - 7.1			
Bleeding (cc)	675	550 - 800			
	Pre-surgical *		Post-Surgical *		p
Hemoglobin (g/dl)	13.5 ± 0.93		11 ± 1.2		0.005
Hematocrit (%)	41.7 ± 2.2		33.4 ± 3		0.007

* Data are presented as median and standard deviation. Comparison between means was performed using Student's t-test.

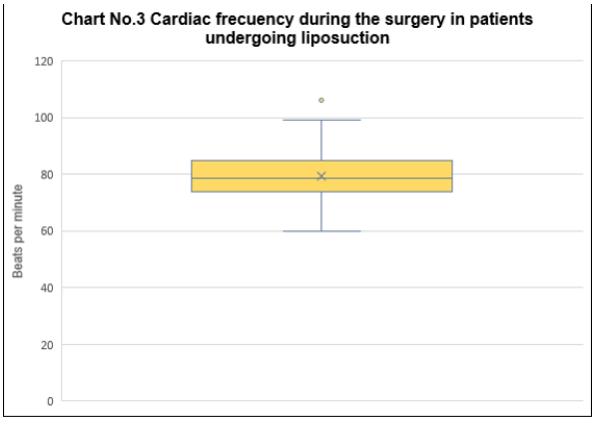

Chart No.3 Cardiac frecuency during the surgery in patients undergoing liposuction

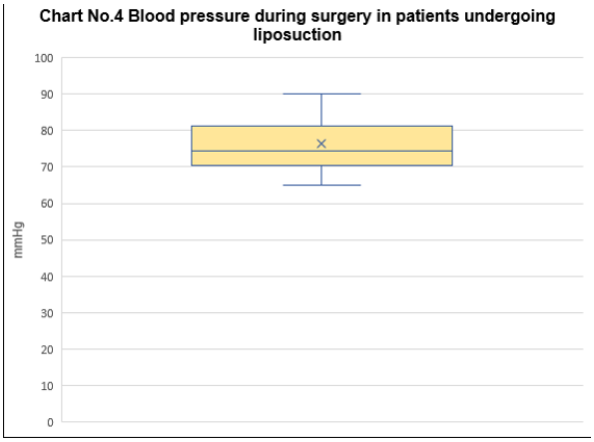

Chart No.4 Blood pressure during surgery in patients undergoing liposuction

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