MICROSURGICAL BREAST RECONSTRUCTION : IMPACT OF COLLOIDS USE IN PERIOPERATIVE BLEEDING

Laspra Coletes M.^{1*}, Lugo Duarte C.¹, Peñas Garrote M.¹, Castro Rincón J.¹, Hernández González J.¹, Pérez Cerdá F.¹, Martín Arriscado C.²

¹ Department of Anesthesiology, Critical Care and Pain Medicine, Hospital Universitario 12 de Octubre, Madrid, Spain.. * Corresponding author.

² Department of Statistics, R&D, Hospital Universitario 12 de Octubre, Madrid, Spain.

Introduction: Perioperative anesthetic management in microsurgical breast reconstruction may influence outcome³. Several aspects including ideal fluid therapy are still debated. Despite colloids use is an extended practice in free-flap microsurgery its impact on bleeding risk is not well established⁴. This study aims to analyse whether perioperative colloid administration is related to increased risk of bleeding, blood transfusion need and reoperation.

Table 1. Demographic and procedural characteristics

	n (%)		n (%)
Number of Patients	59	History of Coagulopathy	1 (1,69)
Age (mean±SD)	51,14 ± 10,03	COPD	1 (1,69)
Weight (mean±SD)	70.27 ± 15.01	Previous Antiplatelet Therapy	1 (1,69)
BMI >30 kg/m² (%)	12 (20,33)	Previous Hormonal Therapy	14 (23,72)
Smoking -Current	10 (16,94)	Preoperative Radiation	5 (8,47)
Peripheral Vascular Disease	1 (1,69)	Hypertension	4 (6,77)
History of TED	2 (3,38)	DM	2 (3,38)
Dyslipidemia	12 (20,33)		
Type of free flap			
MS-TRAM	19 (32,20)	DIEP	39 (66,10)
		TUG	1 (1,69)
Reconstruction Characteristics			
Breast Cancer Mastectomy	58 (98,30)	Immediate Reconstruction	51 (86,44)
Prophylactic Mastectomy (high risk, BCRA positive)	1 (1,69)	Unilateral Reconstruction	51 (86,44)

Abbreviations: BMI : Body Mass Index, TED: thromboembolic disease, COPD: Chronic Obstructive Pulmonary Disease, DM:Diabetes Mellitus, DIEP: Deep Inferior Epigastric artery Perforator Flap, MS-TRAM : Muscle Sparing Transverse Rectus Abdominis Musculocutaneous flap, TUG: Transverse Upper Gracilis flap

Materials & Methods: All autologous free flap breast reconstructions performed in Hospital Universitario 12 de Octubre from January to November 2015, were retrospectively reviewed after approval from our institutional review board. Demographic and surgical info are exposed in table 1. Surgical complications as Significant bleeding (SB) emergent reoperation need (REOP) and blood transfusion (BT) were evaluated in the early postoperative period.

Table 2. Patient fluid therapy and bleeding variables

	n(%)
Non Colloid Fluid Therapy	3 (5,08)
Colloid Fluid Therapy	56 (94,9)
HES 130/0,4	53 (94,6)
Succylinated Gelatins	3 (5,35)
Total Volume of Colloid administered (ml.mean±SD)	1270,94 ± 799,26
IO colloid delivered (ml.mean±SD)	912,71 ± 465,87
PACU colloid delivered (ml.mean±SD)	358,23 ± 333,40
Estimated Bleeding	
IO bleeding [ml.mean±SD]	781,36 ± 346,77
PACU bleeding (ml.mean±SD)	192.05 ± 158.56

Abbreviations: HES: Hidroxyethylstarch, IO: Intraoperative, PACU : Postanesthesia Care Unit

Changes on coagulation tests between preoperative consultation and PACU stay were analysed. Patients were divided in two groups regarding fluid therapy received : colloid fluid therapy group and non-colloid fluid therapy group. Statistical analyses included Chi Square for categorical variables. Where applicable for continuous variables Student t Test and Wilcoxon Rank Sum test were used. All tests were two-tailed, and statistical significance was defined as $P < 0.05$. Analyses were performed using SAS II (SAS Institute Inc.). Mean values are presented as mean $\pm$ standard deviation (SD).

REFERENCES

3. Gardiner MD, Nanchahal J Strategies to ensure success of microvascular free tissue transfer. *J Plast Reconstr Aesthet Surg*. 2010;63: e665-673

4.Brinkman J. Et al. Perioperative Fluid Management and Use of Vasoactive and Antithrombotic Agents in FreeFlap Surgery: A Literature Review and Clinical Recommendations.J Reconstr Microsurg. DOI: <http://dx.doi.org/10.1055/s-0033-1343955>

Results: 94,9% of patients included received colloid fluid therapy. 95% received hydroxyethyl starch based colloids (HES 130/0,4) and 5% gelatins. Estimated bleeding volumes and mean colloid administered volume are exposed in table 2. Within colloid group, incidence of significant bleeding (SB) reoperation (REOP) need and Blood Transfusion are detailed in table 3. No statistically significant differences were found regarding volume of colloids administered and measured outcomes ($p>0.5$). There was not either statistical association between colloid volume and BT ($p>0.5$).

Table 3. Summary of primary outcomes

	NCFTG (n=3,%)	CFTG (n=56,%)	p values
<i>Need of Blood Transfusion</i>	0	10 (17,85)	0.27
<i>Significant Bleeding</i>	1 (33,33)	6 (10,71)	0.54
<i>Need of Reoperation</i>	0	5 (8,9)	0.78

Abbreviations: NCFT: Non Colloid fluid Therapy Group, CFT: Colloid Fluid Therapy Group

Besides volume of colloids administered were statistically correlated with changes in coagulation parameters, as table 4 and figure 1 shows, there was not significant association between coagulation changes and primary outcomes (SB, REOP,BT) ($p>0.5$).

Table 4. Summary of changes in coagulation parameters after colloid delivery

	mean $\pm$ SD	p values
Decrease in Prothrombin activity (% mean $\pm$ SD)	23.56 $\pm$ 10.88	< 0.0001
INR increase (mean $\pm$ SD)	0.18 $\pm$ 0.10	< 0.0001
Platelet count decrease (n° mean $\pm$ SD)	60363 $\pm$ 41991.8	< 0.0001

Abbreviations: INR: International Normalized Ratio

Discussion: There is not statistically relevant correlation between the volume of colloids administered and bleeding, reoperation or blood transfusion outcomes. Despite in our cohort perioperative colloids do not exceed recommended dose (<30ml/kg) its administration induce remarkable lab coagulation abnormalities but with negligible impact in primary outcomes.