Perioperative Management for Microvascular Free Tissue Transfer: A Pilot Study Examining the Utility of a Checklist in Improving Communication Between Microsurgeons and Anesthesiologists

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Disclosure/Financial Support: None of the authors has any relevant financial conflicts.

INTRODUCTION: Free tissue transfer procedures are complex, therefore communication between anesthesiologists and microsurgeons is essential. The pre-operative surgical checklist has been shown to decrease complications, but a checklist specific to free tissue transfer cases has not been described. [1,2] Evidence-based guidelines for intraoperative management of free flaps were developed and used to produce a pre-operative checklist (Figure 1). [3,4] Our goal is to evaluate if a checklist guiding perioperative management for free flap procedures improves communication and adherence to evidence-based guidelines.

MATERIALS AND METHODS: One hundred and fifty four patients who underwent free tissue transfer between January 2011 and February 2015 were selected for this study. Seventy-seven patients (checklist group) underwent free tissue transfer after the microsurgeon and the anesthesiologist had a directed pre-operative discussion following the items detailed in the checklist. Seventy-seven matched patients were retrospectively selected as controls, who had undergone free flaps without a checklist guided discussion. Anesthesia records were reviewed retrospectively for data on core temperature range, crystalloid administration, urine output and use of vasopressors.

RESULTS: Types of flaps are summarized in Table 1. Sixty-three percent of the checklist group had crystalloid administration in recommended range of 3.5cc/kg/hr-6 cc/kg/hr. However, only 38% of the control group had crystalloid administration in the recommended range ($p=0.0022$). Overall, 33.7% of the patients in the control group received IVF in excess of 7L intra-operatively vs. 10.3% of patients in the checklist group ($p=0.0046$). Mean core body temperature was less than 35C° in 16.8% control group patients vs. 2.5% checklist group of patients ($p=0.0027$). Finally, vasopressors were used in 27.2% of patients in both control and checklist group. However, in the checklist group, the type and timing of vasopressor use was always discussed with the microsurgeon, whereas this only occurred in 14% of the control group ($p<0.0001$).

CONCLUSION: Our pilot study demonstrates that a pre-operative checklist guiding intraoperative management ensures critical communication between microsurgeons and anesthesiologists, leading to appropriate vasopressor use, decreasing excessive crystalloid administration and maintaining recommended body temperature. While further studies are necessary to determine the impact on outcomes, we believe that a checklist, as described, is an essential tool in free tissue transfer cases.

REFERENCES:

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LEGENDS:

Figure 1. Perioperative Checklist Used for Communication between Anesthesiologist and Microsurgeons.

Figure 1. Checklist:

☐ 1. Temperature is recorded via: a) esophageal probe b) temperature sensing foley.
☐ 2. Temperature for the patient is 37^{0}C, ideally over 35^{0}C at all times.
☐ Preheat room ☐ Bear hugger on ☐ Warm IVF
☐ 3. Pre-operative Hgb is :
☐ 4. Intraoperative Hgb will be checked at the following interval:
☐ 5. Indications for transfusion are Hgb<7 mg/dL.
☐ 6. Goal urine output is >60 ml/hr for breast reconstruction and >30ml/hr for head and neck reconstruction
☐ 7. Crystalloid administration ideally to be at rate 3.5-6 ml/kg/hr.
☐ 8. Crystalloid administration ideally not to exceed 7 L intra-operatively.
☐ 9. Vasopressors to be administered if a patient is hypotensive and tachycardic and not responsive to initial fluid bolus. Please notify surgeon when initiating vasopressors.
☐ 11. Ideally , there should be no change of anesthesia staff during microsurgical portion of procedure. Surgeon will announce the beginning and end of microsurgery.
☐ 12. Type and dose of antibiotic administered 60 min before incision time is:
☐ 13. Antibiotic to be re-dosed at following time intervals

Table 1. Flaps Included in the Control Group vs. Checklist Group.

Type of flap	Control Group (%)	Checklist Group (%)	Total (%)
H&N Reconstruction	32.4	32.4	32.4
Breast Reconstruction	57	57	57
Lower Extremity Reconstruction	10.3	10.3	10.3
RFFF	13	18	15.5
SIEA	0	1.3	0.6
ALT	10.4	11.6	11
Free Fibula	12.9	11.6	12.3
PAP	0	5.2	2.6
DIEP	53.2	42.8	48.1
msTRAM	28.5	46.7	37.6
Medial Femoral Epicondyle	0	1.3	0.6
Vastus Lateralis	0	2.59	1.2

Note: Several patients in each group had more than one flap for reconstruction.