



# Upper Extremity Reconstruction Using Large Pedicled Flaps in Military, Academic and Community Hospitals

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## Introduction

- **Extensive damage** to the soft tissue of extremities can pose a reconstructive challenge<sup>1-3</sup>
  - Secondary to trauma or cancer excision
  - Often there is no local or regional flaps
  - Often these wounds demand free tissue transfer or large distant pedicled flaps
- **Large Pedicled Flaps** have some benefits over free flaps including:<sup>4-6</sup>
  - Less demanding
  - Basic instruments
  - Faster operative times
  - Minimal postoperative care
  - Bailout option for failed free flap
- **Intraoperative angiography (IOA)**<sup>7-9</sup>
  - A technique that allows for immediate evaluation of tissue perfusion intraoperatively
  - Has been used in free flap evaluation
  - Recently, has been used for timing of division in paramedian forehead flaps
- The **aim** of our study was to perform a multi-institutional (academic, community, and military) review of patients that underwent large distant pedicled flaps for upper extremity reconstruction.
- We want to characterize this type of flap reconstruction and determine if IOA assists in flap survival and potentially improve patient outcomes.

## Methods

- A multi-institution, retrospective review was performed for all cases in which large pedicled flaps (thoracoepigastric and groin flaps) were used for upper extremity reconstruction.
- Institutions included military, academic and community based practices.
- Outcomes focused on patient demographics, flap type, flap necrosis, flap loss and need for additional reconstruction.
- A multivariate analysis was performed and cohorts focused on the flap type for reconstruction, hospital in which the reconstruction was performed and the use of intraoperative angiography for timing of flap division.

## Intraoperative Angiography

**EXAMPLE of the use of intraoperative angiography for timing of division of a large pedicled flap for an upper extremity reconstruction**



**Figure 1. Picture represents a groin flap used for coverage of the dorsal wrist defect in which local options were not available and free tissue transfer unable to be performed due to patient comorbidities**



**Figure 2. Two weeks after inset of the groin flap. Cross-clamping of the proximal pedicle is performed and intraoperative angiography demonstrates minimal retrograde flow, indicating the need for additional time before flap division.**

## Intraoperative Angiography

- Comparison of large pedicled flaps by use of IOA use for timing of flap division.
- Differences in age, flap type (thoracoepigastric or groin flap), partial flap necrosis, flap loss resulting in additional surgery and amputations compared in the table.

Intraoperative Angiography (IOA)	Non-IOA	IOA	P-value
Age (years)	26.1	34.0	NS
Flap Type	22	15	
Groin	13	9	NS
Thoracoepigastric	9	6	NS
Flap Necrosis	6	1	p<0.05
Flap Loss	2	0	p<0.05
Amputation	0	0	NS

- *p-values considered statistically significant at alpha level of less than 0.05.*

## Institutions

- Comparison of large pedicled flap reconstruction in military, academic and community institutions.
- Difference in age, flap type (thoracoepigastric or groin flap), partial flap necrosis, flap loss resulting in additional surgery and amputations compared in the table.

Institution	Military	Academic	Community	P-value
Age (years)	25.5	56.0	30.0	NS
Flap Type	28	4	5	NS
Groin	18	2	0	
Thoracoepigastric	10	2	5	
Flap Necrosis	6	1	0	NS
Flap Loss	2	0	0	NS
Amputation	0	0	0	NS

- *p-values considered statistically significant at alpha level of less than 0.05.*

## Discussion

- **Large pedicled flaps**
  - Should be consider when free flap fail or when microsurgery or free tissue transfer is an unavailable option
- **Institutions**
  - There is no statistical difference noted in any variable based upon the location in which the surgeries were performed
- Our study demonstrates that large pedicled flaps are a safe and effective method in military, academic and community practices
- **Intraoperative Angiography**
  - Using intraoperative angiography to assist in flap division decreases partial flap necrosis and flap loss requiring additional surgical procedures
- Our study demonstrates that intraoperative angiography should be considered for cases in which partial or complete flap loss would lead to excessive morbidity

## References

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