

# Multiple Flap Limb Salvages within Same War Wounded Casualties: A Consecutive Case Series over a Decade of War Trauma

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## Abstract

**Introduction:** War-related trauma from Iraq and Afghanistan has presented our institutions with challenging extremity injuries for limb salvage. While most of our wounded have had single limb salvages, a number of cases have required multiple extremity flap limb salvages. The purpose of this review is to report our experience in limb salvage with particular interest in the subgroup of patients undergoing multiple flap procedures for 2 or more distinct limb salvages.

**Methods:** A retrospective, consecutive case series of war-related extremity limb salvage cases treated from 2003 through 2012 at the National Capital Consortium was completed. Data assessed included number of single, multiple, and corresponding extremity involvement of flap limb salvages. Additional data collected included Injury Severity Score (ISS), timing of coverage, success rates, and complications. Comparisons were made between the single and multiple flap limb salvage cohorts to identify significant differences.

**Results:** A total of 346 flap coverage procedures for limb salvage were performed, consisting of 306 flaps in 279 single flap extremity salvage cases and 40 flaps in 18 multi-extremity salvage cases (17 two-extremity; 1 three-extremity salvage case). Flap success rate for single flap limb salvage was 90% versus 87 % for the multiple limb salvage cohort.

Table 1: Comparisons Between Single and Multiple Limb Salvage Patient Groups

	Single Extremity		Multiple Extremity		P-value
	Mean(SD)	Range	Mean(SD)	Range	
Injury Severity Score (ISS)	17(8.8)	4-50	23(7.2)	16-41	<0.001
Operations Prior to Flap	5.7(3.8)	0-28	6.8(5.1)	4-22	0.185
Time to Flap (days)	34(82)	5-1227	30.7(40.3)	8-255	0.679
Hospital Course (days)	70.3(66.7)	13-818	92.7(45.2)	46-210	0.007

Table 2: Complication Rates Between Single and Multiple Limb Salvage Patient Groups

Complications			
	Single Extremity	Multiple Extremity	
	n(%)	n(%)	P-value
Total	70(23)	13(36)	0.236
Infection	17(5)	1(3)	0.706

Hematoma/seroma	11(4)	4(11)	0.082
Flap Failure	31(10)	5(13)	0.587
Amputations/Failed Limb Salvage	39(14)	5(14)	0.706

**Conclusion:** The last decade of war trauma has presented our institution with a high volume of limb salvage cases including a number of casualties requiring multiple flaps for multi-extremity limb salvage. Single and multiple flap limb salvage procedures had similar success and complication rates. Multiple flap limb salvages can be performed on the same patient without concern for increased complication or failure rate in carefully selected and appropriately managed patients.