

Operative Versus Nonoperative Management of Civilian Gunshot Wounds to the Spinal Cord

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Purpose: Surgical indications for spinal cord injury from gunshot (GSCI) are controversial. Functional Independence Measure (FIM) scores for neurologic recovery have not been reported. The purpose of this study is to analyze complications and functional outcomes after GSCI and to compare surgical and nonsurgical management for injuries that did not require surgical decompression or stabilization.

Methods: The trauma registry at an urban Level I trauma center was queried for isolated GSCI between 2006 and 2015. Complications, length of stay (LOS), FIM scores, and FIM gains were determined.

Results: 104 patients were identified—67 complete GSCI and 37 incomplete. For complete GSCI, 16 (24%) had surgery. Mean follow-up was 26.9 months. Baseline characteristics were similar between surgical (SX) and nonsurgical (NSX) groups except higher median ISS in the NSX group (34 vs 27; P = 0.02). No differences in complication rates were noted. For complete GSCI, LOS was longer for SX (52 vs 42 days; P = 0.04), with no difference in FIM scores (58 vs 54; P = 0.7). For incomplete GSCI, 7 patients (19%) underwent surgery. For incomplete GSCI, rehabilitation LOS was longer for SX (35 vs 21 days; P = 0.02) with trend for longer LOS (40 vs 32 days; P = 0.07). FIM scores were no different (61 vs 62; P = 0.9).

Conclusion: Surgery for GSCI is associated with longer LOS and no differences in complications or FIM scores for patients with either complete or incomplete spinal cord injuries. The majority of patients with GSCI may be safely treated nonoperatively, as surgery has greater treatment costs without measured clinical benefit.

POSTER ABSTRACTS

Table 1. Outcome measures for patients with complete spinal cord injury from gunshot wounds

	Surgery (n=16)	No Surgery (n=51)	P value
Intensive Care Unit LOS	10 (1.23)	4 (2.13)	0.4
LOS Hospital	21 (7.26)	9 (4.21)	0.2
LOS Rehab	39 (21.65)	29 (10.39)	.05
Total LOS	52 (40.87)	42 (22.61)	0.04*
Ventilator Days	1 (0.21)	1 (0.10)	0.7
Chest tube placed	10 (63%)	27 (53%)	0.5
Pneumo/Hemothorax	10 (63%)	25 (49%)	0.3
Lung Injury	11 (69%)	32 (63%)	0.7
Complications			
Cardiac	2 (13%)	4 (8%)	0.6
Pulmonary	9 (56%)	22 (43%)	0.4
Deep vein thrombosis or pulmonary embolus	2 (13%)	4 (8%)	0.6
Decubitus ulcer	7 (44%)	10 (20%)	0.05
Non-surgical infection	5 (31%)	7 (14%)	0.1
Trauma readmit	1 (6%)	5 (10%)	0.9
Acute kidney injury	0	3 (6%)	0.9
Urinary tract infection	10 (63%)	24 (47%)	0.3
Ileus	3 (19%)	5 (10%)	0.4
Dural leak	1 (6%)	1 (2%)	0.2
FIM total			
Rehab admission	26 (20.34)	25 (22.29)	0.7
Rehab Discharge	58 (45.66)	54 (43.63)	0.7
FIM Gain	25 (19.30)	26 (15.37)	0.9

Table 2. Outcome measures for patients with incomplete spinal cord injury from gunshot wounds

	Surgery (n=7)	No Surgery (n=30)	P value
Intensive Care Unit LOS ¹	4 (2.5)	3 (1.5)	0.2
LOS ¹ Hospital	8 (5.18)	7 (4.14)	0.7
LOS ¹ Rehab	35 (28.41)	21 (13.35)	0.02*
Total LOS ¹	40 (35.53)	32 (23.42)	0.07
Ventilator Days	0 (0.2)	1 (0.2)	0.5
Chest tube placed	2 (29%)	8 (27%)	0.9
Pneumo/Hemothorax	2 (29%)	8 (27%)	0.9
Lung Injury	3 (43%)	11 (37%)	0.9
Complications			
Cardiac	1 (14%)	4 (13%)	0.9
Pulmonary	1 (14%)	4 (13%)	0.9
Deep vein thrombosis or pulmonary embolus	1 (14%)	3 (10%)	0.9
Decubitus ulcer	2 (29%)	1 (3%)	0.09
Non-surgical infection	1 (14%)	4 (13%)	0.9
Trauma readmit	1 (14%)	3 (10%)	0.9
Acute kidney injury	0	0	-
Urinary tract infection	3 (43%)	10 (33%)	0.7
Ileus	1 (14%)	8 (27%)	0.7
Dural leak	1 (14%)	1 (3%)	0.3
FIM ² total			
Rehab admission	24 (23.36)	27 (23.36)	0.9
Rehab Discharge	61 (48.71)	62 (55.70)	0.9
FIM ² Gain	30 (19.38)	33 (18.44)	0.5

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.