

Sarah Majercik¹ · Scott Gardner¹ · Evert A. Eriksson² · Joseph D. Forrester³ · Joshua A. Villarrea¹³ · Zachary M. Bauman⁴ · Lindsey Cavlovic⁵ · Andrew R. Doben⁶ · Gregory R. Semon⁷ · Fredric M. Pieracci⁸ · Theresa Morin⁸ · Kelley Mancine⁸ · Zachary D. Warriner⁹ · Caroline Neff^{9,10} · SarahAnn S. Whitbeck¹⁰ · Thomas W. White¹

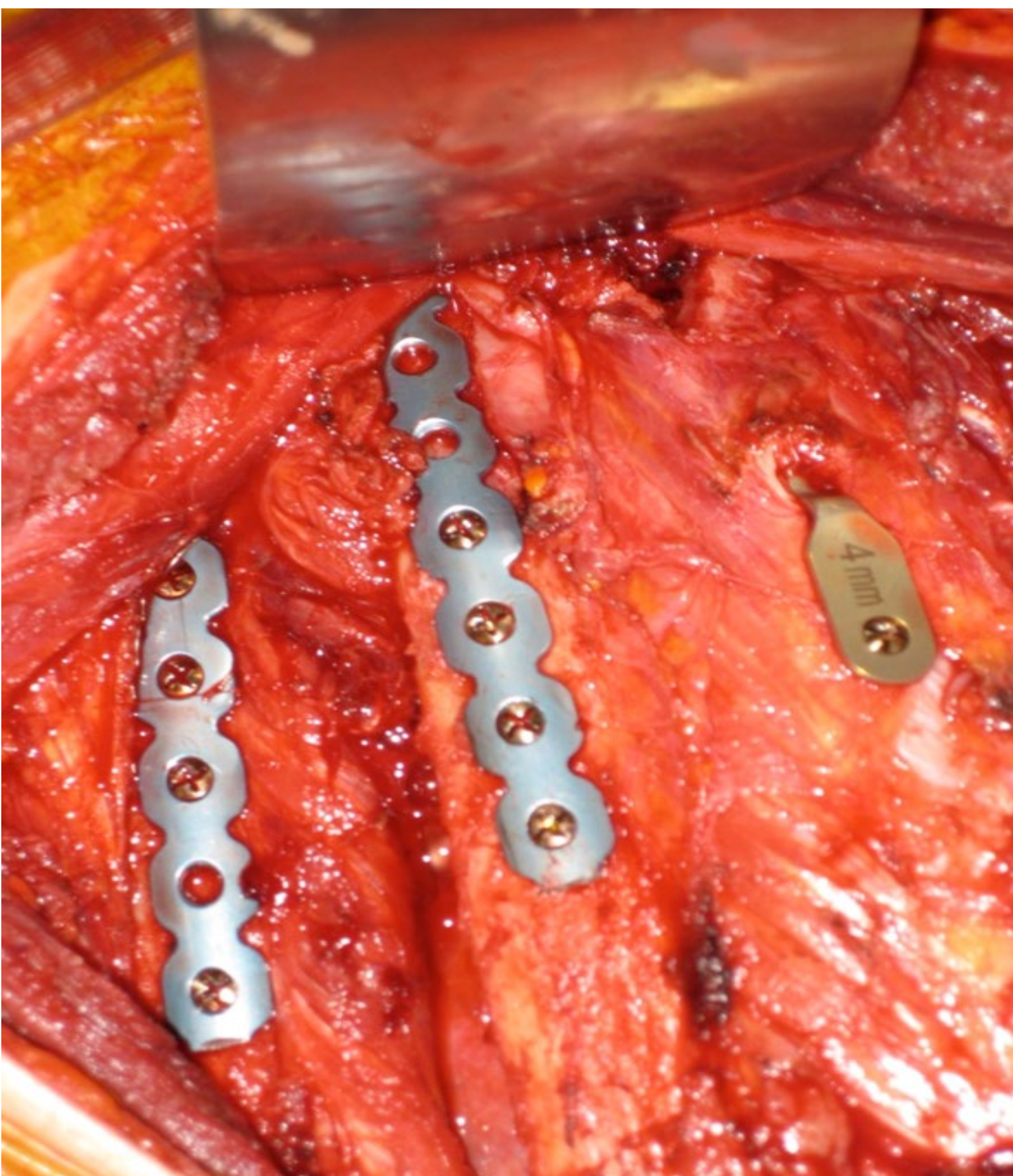
1 Intermountain Medical Center Salt Lake City, UT 2 Medical University of South Carolina, Charleston, SC. 3 Stanford University, Stanford HealthCare, Stanford, CA. 4 University of Nebraska Medical Center, Omaha, NE 5 College of Osteopathic Medicine, KCU, Kansas City, MO.6 Saint Francis Hospital, Hartford, CT. 7 Miami Valley Hospital, Dayton, OH. 8 Denver Health Medical Center, University of Colorado, SOM, Denver, CO. 9 University of Kentucky Chandler Medical Center, Lexington, KY. Chest Wall Injury Society, Salt Lake City, UT

Background			Results		
- Rib fractures are common injuries among patients admitted to trauma centers. This can result in morbidity, prolonged pain and long-term disability. - The surgical stabilization of rib fractures (SSRF) involves the surgical implantation of titanium plates across the fracture site to hold the ribs in the correct anatomical position while they heal. - SSRF has been shown to be highly beneficial, demonstrating a shorter hospital stay, a shorter recovery and faster return to baseline activity. - Practices surrounding adjunct procedures (i.e., tube thoracostomy, pleural space drainage, intra-operative lavage etc.) are varied across institutions and may contribute to differences in outcomes.			273 patients from 8 centers were included. Median age was 60 (46–68), 70% were male, and 99% suffered blunt trauma. - ISS was 17 (13–26), ranging from a low of 14 (10–19) to 26 (18–35) (p = 0.002). Median operative time was 2.5 (1.9–3.3) hours, with 5 (4–6) plates placed. - VATS ranged from 2 to 78% at each center and PL ranged from 25 to 100% (p < 0.001). - Almost all patients received TT. TT remained in place for 3 (2–4) days, few (2%) had any complication related to the TT, nor did they require drain replacement (7%) or reoperation (2%). ICU and hospital lengths of stay were 3 (2–6) and 8 (6–13) days (P < 0.001). Readmission rates were low (4%) and did not differ between centers.		
Aim			Conclusions		
Management of the pleural space during and after SSRF is a matter of debate. Tube thoracostomy (TT), intraoperative pleural lavage (PL) and video assisted thoracoscopic surgery (VATS) use varies between surgeons. The purpose of this study is to describe differences in practice patterns of pleural space management (TT, PL, VATS) after SSRF at institutions with extensive experience in chest wall reconstruction.			At centers experienced in SSRF, there is variation in management of the pleural space. While ICU and hospital lengths of stay are different between centers rates of reoperation and readmission are similar. Further study is needed to delineate optimal management of the pleural space after SSRF. This study was published in the European Journal of Trauma and Emergency Surgery PMID: 40232329		
Methods			Conclusions		
- This study was a prospective, observational trial conducted at 8 United States Level I or II Trauma Centers between January 1, 2020, and September 1, 2022. All participating centers have at least one physician member of the Chest Wall Injury Society (CWIS). - There were no study interventions. Patients were managed according to individual institutional protocols with regard to surgical timing, technique, fixation system, pleural drainage, and post-operative care. - All statistical analyses were performed using R version 4.0.2 (2020–06–22).			Conclusions		

Table 3 Characteristics of operative and pleural space management by site

Variable	All	A	B	C	D	E	Z	P-value
N	273	86	16	63	49	40	19	
Total operative time (hours)	Median (IQR) 2.50 (1.86–3.32)	1.98 (1.56–2.36)	3 (2–4)	2.57 (2.12–3.00)	2.68 (2.17–3.43)	3.08 (2.68–3.91)	3.33 (2.57–4.47)	<.001
Number of plates/ screws used	Median (IQR) 5 (4–6)	4 (3–6)	4.00 (4.00–5.00)	6 (4–7)	5 (4–6)	4 (3–5)	4 (3–5)	<.001
VATS	37% (100)	2% (2)	56% (9)	43% (27)	47% (23)	78% (31)	42% (8)	<.001
Intra-operative pleural lavage (PL)	90% (245)	90% (77)	25% (4)	100% (63)	100% (49)	95% (38)	74% (14)	<.001*
Pleural drain (TT)								<.001*
No drain	1% (3)	2% (2)	0% (0)	0% (0)	0% (0)	2% (1)	0% (0)	
Conventional chest tube	23% (64)	6% (5)	100% (16)	0% (0)	47% (23)	18% (7)	68% (13)	
Blake drain	51% (140)	90% (77)	0% (0)	0% (0)	51% (25)	80% (32)	32% (6)	
Pigtail catheter	24% (65)	1% (1)	0% (0)	100% (63)	2% (1)	0% (0)	0% (0)	
Re-operation	2% (5)	2% (2)	0% (0)	0% (0)	6% (3)	0% (0)	0% (0)	0.153*

*denotes that the p-value was obtained through simulation



Google: Rib fracture

Table 4 Characteristics of post-operative care by site

Variable	All	A	B	C	D	E	Z	P-value
N	273	86	16	63	49	40	19	
Total days patient had a pleural drain	Median (IQR) 3 (2–4)	3 (2–5)	4 (3–5)	2.00 (1.00–2.00)	3 (2–4)	2 (1–3)	4 (2–5)	<.001
Complications related to pleural drain								<.001*
None	86% (235)	98% (84)	94% (15)	83% (52)	96% (47)	48% (19)	95% (18)	
Recurrent hemothorax	1% (3)	0% (0)	0% (0)	0% (0)	0% (0)	5% (2)	5% (1)	
Recurrent pneumothorax	7% (19)	1% (1)	6% (1)	2% (1)	0% (0)	40% (16)	0% (0)	
Other	1% (4)	0% (0)	0% (0)	2% (1)	2% (1)	5% (2)	0% (0)	
Drain replacement/re-intervention								<.001*
Yes	7% (18)	1% (1)	6% (1)	3% (2)	8% (4)	10% (4)	32% (6)	
No	90% (247)	99% (85)	81% (13)	89% (56)	92% (45)	90% (36)	63% (12)	
Hospital LOS (days)	Median (IQR) 8 (6–13)	8 (5–10)	17 (10–29)	11 (7–16)	7 (6–9)	6 (5–12)	10 (7–12)	<.001
ICU LOS (days)	Median (IQR) 3 (2–6)	3 (2–6)	10 (4–19)	3 (2–7)	2 (1–3)	4 (2–6)	4 (3–5)	<.001
Hospital readmission (30-day)	4% (12)	2% (2)	6% (1)	6% (4)	4% (2)	5% (2)	5% (1)	0.914*
Hospital readmission (90-day)	5% (14)	2% (2)	6% (1)	8% (5)	4% (2)	8% (3)	5% (1)	0.709*
Surgical Site Infection (SSI)	1% (2)	0% (0)	6% (1)	0% (0)	0% (0)	2% (1)	0% (0)	0.052*
Re-operation	2% (5)	2% (2)	0% (0)	0% (0)	6% (3)	0% (0)	0% (0)	0.157*
Mortality (30-day)	4% (12)	0% (0)	0% (0)	10% (6)	2% (1)	10% (4)	5% (1)	0.140*
Mortality (90-day)	4% (12)	0% (0)	0% (0)	10% (6)	2% (1)	10% (4)	5% (1)	0.128*

*denotes that the p-value was obtained through simulation