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Surgical Site Infection is a Risk Factor for Long-Term Hardware Failure in Patients with Spinal Deformity

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Introduction

Hardware failure is a major complication after correction of adult spinal deformity. While few studies have reported a correlation between surgical site infection and hardware failure, none has irrevocably demonstrated the existence of such a link.

Methods

An extensive chart review was conducted for all patients at least 18 years old undergoing corrective surgery for thoracolumbar scoliosis between 2006 and 2017 at our institution. Data were analyzed to identify factors predisposing to failure of instrumentation.

Results

532 patients met criteria for inclusion. Of these, 20 (4%) had surgical site infection. There were no demographic or clinical characteristics associated with surgical site infection. Number of fused levels and operative time were similar between groups. Hardware failure occurred in 68 (12.8%) patients, 10 of whom (15%) had surgical site infection, while of the 464 patients with no hardware failure, only 10 (2%) had surgical site infection (p=0.003). Of the 20 patients with surgical site infection, 10 (50%) had hardware failure, while in the 512 patients with no infection, only 58 (11%) had hardware failure (p=0.002). Patients with infection also experienced significantly shorter time to hardware failure (p=0.015), higher need for revision surgery (p<0.001), and shorter time to revision surgery (p=0.001).

Table 1

		All Patients (n=532)	SSI (n=20)	No SSI (n=512)	*p*-value
Mean Age (Years)		61 (±17)	65 (±14)	61 (±18)	0.162
Men		253 (48%)	12 (60%)	241 (47%)	0.138
Women		279 (52%)	8 (40%)	271 (52%)	0.138
Mean BMI (Kg/m^2)		27 (±5)	28 (±5)	27 (±5)	0.169
Tobacco use	*Active*	40 (8%)	3 (15%)	37 (7%)	0.179
	Former	169 (32%)	8 (40%)	161 (31%)	0.231
	Any	209 (39%)	11 (55%)	198 (39%)	0.087
	Never	323 (61%)	9 (45%)	314 (61%)	0.087
Osteoporosis		144 (27%)	4 (20%)	140 (27%)	0.221
Hypertension		228 (43%)	10 (50%)	218 (43%)	0.268
Diabetes mellitus type II		81 (15%)	6 (30%)	75 (15%)	0.085
Arthritis		192 (36%)	8 (40%)	184 (36%)	0.363

Table 2

	All Patients (n=532)	SSI (n=20)	No SSI (n=512)	*p*-value
Mean Number of Fused Levels	6.3 (±3.6)	6.1 (±3.7)	6.3 (±3.6)	0.391
Mean Blood Loss Volume (mL)	591 (±333)	500 (±211)	594 (±337)	0.043*
Mean Operative Time (hr)	3.9 (±1.9)	3.6 (±1.4)	3.9 (±1.9)	0.192

Table 3

	All Patients (n=532)	SSI (n=20)	No SSI (n=512)	*p*-value
Hardware Failure	68 (13%)	10 (50%)	58 (11%)	0.002
Time to Hardware Failure (mo)	41 (±76)	16 (±25)	46 (±81)	0.015
Need for Revision Surgery	111 (21%)	15 (75%)	96 (19%)	<0.001
Time to Revision Surgery (mo)	28 (±49)	10 (±13)	31 (±52)	0.001

Conclusions

Our study demonstrates that early surgical site infection significantly increases the risk of instrumentation failure in patients with thoracolumbar scoliotic deformity, shortens the time to hardware failure, increases the rate of revision surgery, and decreases time to revision surgery.

References

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