

Development and validation of predictive nomogram for postoperative non-union of closed femoral shaft fracture

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SI Table 1 Sex and age comparison between included and excluded patients [n (%)]

Variable	All	Included patients (n=729)	Excluded patients (n=1024)	χ^2 value	P value
Sex				2.469	0.116
Male	1298(74.0)	554(76.0)	744(72.7)		
Female	455(26.0)	175(24.0)	280(27.3)		
Age(years)				7.109	0.213
0-10	527(30.1)	203(27.8)	324(31.6)		
11-20	242(13.8)	106(14.5)	136(13.3)		
21-30	351(20.0)	155(21.3)	196(19.1)		
31-40	233(13.3)	104(14.3)	129(12.6)		
41-50	202(11.5)	89(12.2)	113(11.0)		
>50	198(11.3)	72(9.9)	126(12.3)		

SI Table 2 Characteristics of closed femoral shaft fracture patients [n (%)]

Variable	All	Training cohort (n=617)	Validation cohort (n=112)	χ^2 value	P value
Postoperative non-union				3.026	0.082
Yes	66(9.1)	51 (8.3)	15(13.4)		
No	663(90.9)	566(91.7)	97(86.6)		
Sex				0.482	0.488
Male	554(76.0)	466(75.5)	88(78.6)		
Female	175(24.0)	151(24.5)	24(21.4)		
Age(years)				11.084	0.050
0-10	203(27.8)	159(25.8)	44(39.3)		
11-20	106(14.5)	90(14.6)	16(14.3)		
21-30	155(21.3)	135(21.9)	20(17.9)		
31-40	104(14.3)	90(14.6)	14(12.5)		
41-50	89(12.2)	82(13.3)	7(6.3)		
>50	72(9.9)	61(9.9)	11(9.8)		
Ethnic origin				0.031	0.861
Han	711(97.5)	601(97.4)	110(98.2)		
Others	18(2.5)	16(2.6)	2(1.8)		
Urbanization				0.019	0.890
Urban area	127(17.4)	108(17.5)	19(17.0)		
Rural area	602(82.6)	509(82.5)	93(83.0)		
Occupation				9.191	0.102
Student	230(31.6)	186(30.1)	44(39.3)		
Office worker	66(9.1)	51(8.3)	15(13.4)		
Farmer	214(29.4)	190(30.8)	24(21.4)		
Manual worker	30(4.1)	27(4.4)	3(2.7)		
Retired or Unemployed	17(2.3)	15(2.4)	2(1.8)		
Others	172(23.6)	148(24.0)	24(21.4)		
BMI (kg/m²)				15.571	0.001
< 18.5	218(29.9)	180(29.2)	38(33.9)		
18.5-23.9	253(34.7)	211(34.2)	42(37.5)		
24-27.9	234(32.1)	211(34.2)	23(20.5)		
≥ 28.0	24(3.3)	15(2.4)	9(8.0)		
Season				5.237	0.155
Spring	191(26.2)	157(25.4)	34(30.4)		
Summer	168(23.0)	136(22.0)	32(28.6)		
Autumn	214(29.4)	186(30.1)	28(25.0)		
Winter	156(21.4)	138(22.4)	18(16.1)		
Smoking				8.478	0.004
Yes	129(17.7)	120(19.4)	9(8.0)		
No	600(82.3)	497(80.6)	103(92.0)		
Drinking				2.304	0.129

Yes	135(18.5)	120(19.4)	15(13.4)		
No	594(81.5)	497(80.6)	97(86.6)		
AO/OTA classification				0.553	0.759
A	401(55.0)	341(55.3)	60(53.6)		
B	221(30.3)	188(30.5)	33(29.5)		
C	107(14.7)	88(14.3)	19(17.0)		
Injury cause				6.328	0.176
Traffic accident	289(39.6)	237(38.4)	52(46.4)		
Fall on the flat ground	179(24.6)	148(24.0)	31(27.7)		
Fall from a high altitude	30(4.1)	27(4.4)	3(2.7)		
Heavy objects crash	207(28.4)	185(30.0)	22(19.6)		
Other	24(3.3)	20(3.2)	4(3.6)		
Preoperative combined injuries				2.055	0.152
Yes	265(36.4)	231(37.4)	34(30.4)		
No	464(63.6)	386(62.6)	78(69.6)		
Hypoalbuminemia				0.037	0.848
Yes	27(3.7)	22(3.6)	5(4.5)		
No	702(96.3)	595(96.4)	107(95.5)		
Diabetes				1.350	0.245
Yes	13(1.8)	13(2.1)	0(0.0)		
No	716(98.2)	604(97.9)	112(100.0)		
Hypertension				1.318	0.251
Yes	18(2.5)	13(2.1)	5(4.5)		
No	711(97.5)	604(97.9)	107(95.5)		
Coronary heart disease				0.152	0.696
Yes	13(1.8)	10(1.6)	3(2.7)		
No	716(98.2)	607(98.4)	109(97.3)		
Osteoporosis				0.077	0.781
Yes	12(1.6)	11(1.8)	1(0.9)		
No	717(98.4)	606(98.2)	111(99.1)		
Respiratory system disease				1.62	0.203
Yes	22(3.0)	16(2.6)	6(5.4)		
No	707(97.0)	601(97.4)	106(94.6)		
Hepatobiliary system disease				0.452	0.501
Yes	22(3.0)	17(2.8)	5(4.5)		
No	707(97.0)	600(97.2)	107(95.5)		
Anemia				10.594	0.001
Yes	14(1.9)	7(1.1)	7(6.3)		
No	715(98.1)	610(98.9)	105(93.8)		
Other preoperative underlying conditions				1.829	0.176
Yes	34(4.7)	26(4.2)	8(7.1)		
No	695(95.3)	591(95.8)	104(92.9)		
Waiting time for surgery(days)				3.062	0.216

0-7	593(81.3)	496(80.4)	97(86.6)		
8-14	105(14.4)	92(14.9)	13(11.6)		
>14	31(4.3)	29(4.7)	2(1.8)		
Operation method				4.142	0.042
Open	301(41.3)	245(39.7)	56(50.0)		
Closure	428(58.7)	372(60.3)	56(50.0)		
Internal fixation				3.690	0.297
Intramedullary nail	461(63.2)	391(63.4)	70(62.5)		
Screw	30(4.1)	27(4.4)	3(2.7)		
Screw + Plate	172(23.6)	148(24.0)	24(21.4)		
Screw + Plate+ Bone graft	66(9.1)	51(8.3)	15(13.4)		
Anesthesia				0.021	0.885
General anesthesia	399(54.7)	337(54.6)	62(55.4)		
Local anesthesia	330(45.3)	280(45.4)	50(44.6)		
Bone defect				2.880	0.090
Yes	83(11.4)	65(10.5)	18(16.1)		
No	646(88.6)	552(89.5)	94(83.9)		
Postoperative infection				0.163	0.687
Yes	52(7.1)	43(7.0)	9(8.0)		
No	677(92.9)	574(93.0)	103(92.0)		
Deep vein thrombosis of lower extremities				0.434	0.510
Yes	78(10.7)	68(11.0)	10(8.9)		
No	651(89.3)	549(89.0)	102(91.1)		
Other postoperative complications				0.2	0.655
Yes	7(1.0)	5(0.8)	2(1.8)		
No	722(99.0)	612(99.2)	110(98.2)		
Rehabilitation training				0.437	0.509
Yes	71(9.7)	62(10.0)	9(8.0)		
No	658(90.3)	555(90.0)	103(92.0)		
Weight-bearing time (months)				12.518	0.014
0-1	208(28.5)	184(29.8)	24(21.4)		
1-2	214(29.4)	190(30.8)	24(21.4)		
2-3	67(9.2)	52(8.4)	15(13.4)		
3-6	199(27.3)	159(25.8)	40(35.7)		
> 6	41(5.6)	32(5.2)	9(8.0)		