

Table S1 Search string in databases PubMed and Embase

Database	Search string
PubMed	<p>("Thoracic"[tiab] OR "Intrathoracic"[tiab] OR "Trachea"[tiab] OR "cardiac"[tiab] OR "Bronchus"[tiab] OR "Lung"[tiab] OR "Aorta"[tiab] OR "Esophagus"[tiab] OR "artery"[tiab] OR "Mediastinum"[tiab] OR "Mediastinal"[tiab] OR "Transmediastinal"[tiab] OR "VATS"[tiab] OR "Video-assisted"[tiab])</p> <p>AND</p> <p>("Migration"[tiab] OR "Shift"[tiab] OR "Movement"[tiab] OR "displacement"[tiab] OR "penetrating"[tiab] OR "perforation"[tiab] OR "Humerus"[tiab] OR "Humeral"[tiab] OR "Sternum"[tiab] OR "sternal"[tiab] OR "Clavicle"[tiab] OR "clavicular"[tiab] OR "Acromion"[tiab] OR "Acromioclavicular"[tiab] OR "Rib"[tiab] OR "Hip"[tiab] OR "Dislocation"[tiab] OR "Fracture"[tiab])</p> <p>AND</p> <p>("osteosynthesis"[tiab] OR "Kirschner"[tiab] OR "Steinmann"[tiab] OR "Steinman"[tiab] OR "K-wire"[tiab] OR "K-Pin"[tiab] OR "Wire"[tiab] OR "Pin"[tiab])</p>
Embase	<p>('Thoracic':ti,ab,kw OR 'Intrathoracic':ti,ab,kw OR 'Trachea':ti,ab,kw OR 'cardiac':ti,ab,kw OR 'Bronchus':ti,ab,kw OR 'Lung':ti,ab,kw OR 'Aorta':ti,ab,kw OR 'Esophagus':ti,ab,kw OR 'artery':ti,ab,kw OR 'Mediastinum':ti,ab,kw OR 'Mediastinal':ti,ab,kw OR 'Transmediastinal':ti,ab,kw OR 'VATS':ti,ab,kw OR 'Video-assisted':ti,ab,kw)</p> <p>AND</p> <p>('Migration':ti,ab,kw OR 'Shift':ti,ab,kw OR 'Movement':ti,ab,kw OR 'displacement':ti,ab,kw OR 'penetrating':ti,ab,kw OR 'perforation':ti,ab,kw OR 'Humerus':ti,ab,kw OR 'Humeral':ti,ab,kw OR 'Sternum':ti,ab,kw OR 'sternal':ti,ab,kw OR 'Clavicle':ti,ab,kw OR 'clavicular':ti,ab,kw OR 'Acromion':ti,ab,kw OR 'Acromioclavicular':ti,ab,kw OR 'Rib':ti,ab,kw OR 'Hip':ti,ab,kw OR 'Dislocation':ti,ab,kw OR 'Fracture':ti,ab,kw)</p> <p>AND</p> <p>('osteosynthesis':ti,ab,kw OR 'Kirschner':ti,ab,kw OR 'Steinmann':ti,ab,kw OR 'Steinman':ti,ab,kw OR 'K-wire':ti,ab,kw OR 'K-Pin':ti,ab,kw OR 'Wire':ti,ab,kw OR 'Pin':ti,ab,kw)</p> <p>NOT 'conference abstract':it</p>

Table S2 Inclusion and exclusion criteria

Inclusion criteria	<ol style="list-style-type: none">1. Language: research articles in English, Dutch, German or French2. Research articles: original research articles, case reports, systematic reviews without any restrictions of publication date or specific journals3. Content:<ol style="list-style-type: none">a. Intra-thoracic regionb. Migrationc. osteosynthesis materiald. material used for fracture related osteosynthesise. Postoperative complicationf. Human subject4. Full text available (freely online or via KU Leuven library)
Exclusion criteria	<ol style="list-style-type: none">1. Language: other than English, Dutch, German or French2. Study type: all papers that are not original research articles, case reports or systematic review, e.g. experimental studies, letter to editor, conference abstracts, editorials, ...3. Content:<ol style="list-style-type: none">a. NOT intra-thoracic regionb. NOT migratedc. NOT osteosynthesis materiald. NOT material used for fracture related osteosynthesise. NOT a postoperative complication, e.g. perioperative migrationf. NOT human subject4. No full text available

Table S3 Intrapulmonary migration

Author	Year	age gender	Origin of osteosynthesis material	side	Trajectory	Osteosynthesis material	state	Interval (months)	Operative technique	Duration of hospitalization (days)	Detailed anatomic region
Dutta (23)	2018	60 M	Acromioclavicular joint	left	nonlinear	K wire	total	9	thoracoscopy	1	left upper lobe and subaortic space
Gopalakrishnan (24)	2018	42 F	Acromioclavicular joint	right	linear	K wire	broken	180	thoracotomy	4	embedded in the right upper lobe
Retief (25)	1978	27 M	Acromioclavicular joint	right	linear	K wire	total	6 weeks	laparotomy	N/A	puncture of the right upper lobe
Rey-Baltar (26)	1964	29 M	clavicle	left	linear	Steinmann pin	total	7	thoracotomy	9	anteriorly middle lobe
Cabañero (27)	2018	64 F	clavicle	right	linear	K wire	total	6 weeks	thoracoscopy thoracotomy	3	left pulmonary apex, posterior to the supra-aortic trunks, trachea, and esophagus
Cortés-Julián (28)	2015	56 M	clavicle	left	linear	K wire	total	360	thoracoscopy	5	middle lobe, in close contact with the right auricle
Hegemann (29)	2005	59 M	clavicle	left	linear	K wire	total	6 weeks	thoracoscopy	5	penetrating the middle lobe and right upper lobe
Irianto (30)	2018	34 F	clavicle	left	linear	K wire	total	36	thoracotomy	5	right upper lobe
Nakayama (31)	2009	30 M	clavicle	right	linear	K wire	broken	8	thoracotomy	N/A	penetrating right upper lung and penetrating the trachea
Amara (32)	2024	61 M	clavicle	right	nonlinear	K wire	total	300	thoracotomy	2	right upper lobe
Reghine (33)	2018	65 F	clavicle	left	nonlinear	K wire	total	240	thoracotomy	4	left lung apex
Grauthoff (34)	1978	50 M	clavicle	left	linear	K wire	total	49	thoracotomy	N/A	right lower lobe
Grauthoff (34)	1978	60 M	clavicle	left	linear	K wire	total	228	shoulder incision	N/A	left lung apex
Grauthoff (34)	1978	18 M	clavicle	left	linear	K wire	total	96	thoracotomy	N/A	left upper lobe
Marchi (35)	2008	26 M	clavicle	left	linear	K wire	total	156	thoracoscopy thoracotomy	2	right upper lung
Suzuki (36)	2017	69 F	Glenohumeral joint	right	linear	K wire	total	1	shoulder incision	N/A	right upper lung
Tenconi (37)	2014	79 F	Glenohumeral joint	right	linear	K wire	total	N/A	thoracotomy	8	penetrating the right upper lobe with intraparenchymal surrounding hematoma
Bleetman (38)	2015	89 F	Glenohumeral joint	right	linear	Steinmann pin	total	4 weeks	thoracoscopy	2	extending through the right upper lobe, with its tip adjacent to the wall of the descending thoracic aorta
Schwartz (5)	2011	78 F	humeroscapular joint	left	linear	Steinmann pin	total	60	sternotomy	14	traversing the left upper lobe, mediastinum and right upper lobe
Calkins (39)	2001	48 M	proximal humerus	right	nonlinear	AO fixation pin	total	7 weeks	thoracoscopy	N/A	superior segment of the right lower lobe
Cameliere (12)	2013	62 F	proximal humerus	right	nonlinear	K wire	total	48	thoracotomy	N/A	right upper and lower lobes, passing the scissure
Cerruti (10)	2016	69 F	proximal humerus	left	linear	K wire	total	4	thoracoscopy	3	left lower lobe, with its tip posterior and inferior to the left ventricle
Fuster (13)	1990	42 M	proximal humerus	right	linear	K wire	total	8	thoracotomy	N/A	right upper lobe
Khan (40)	2003	42 F	proximal humerus	left	nonlinear	K wire	total	4	thoracotomy	2	left upper lobe, with its tip lying close to the pericardium
Kim (41)	2000	55 F	proximal humerus	right	linear	Steinmann pin	total	16	thoracotomy	N/A	penetrating the apex of the right upper lung, the distal tip had lodged in the semispinalis dorsii muscle posteriorly
McCaughan (42)	1969	12 M	proximal humerus	left	linear	Steinmann pin	total	39	thoracotomy	N/A	apical posterior segment on the left, extending into the superior segment of the lower lobe
Mellado (43)	2004	85 F	proximal humerus	right	linear	K wire	total	10 days	thoracotomy	N/A	right upper lobe
Pientka (44)	2016	78 M	proximal humerus	left	linear	K wire	total	45 days	thoracotomy	11	penetrating left upper lobe, abutting the pericardium
Sergides (45)	2009	59 M	proximal humerus	right	linear	Steinmann pin	total	3 weeks	thoracotomy	3	embedded in the superior segment of the right lower lobe
Tristan (46)	1964	12 F	proximal humerus	right	linear	K wire	total	3	thoracotomy	13	right upper lobe, just anterior to the oblique fissure
Van Hasselt (47)	2021	90 F	proximal humerus	left	nonlinear	K wire	total	3 days	thoracoscopy	N/A	lingula of the left lung, the tip situated near the pericardium
Zacharia (48)	2016	63 M	proximal humerus	right	nonlinear	K wire	total	36	thoracoscopy	N/A	posterior segment of the right apical lobe
Chaurasia (49)	2015	80 F	proximal humerus	right	linear	K wire	total	N/A	thoracoscopy	N/A	superior segment of the right lower lobe
Bang (50)	2017	26 F	proximal humerus	right	linear	K wire	total	6 weeks	thoracotomy	7	right upper lobe , behind the pericardium and in front of the descending aorta
Bedi (51)	1997	8 M	proximal humerus	right	nonlinear	K wire	broken	1 week	thoracotomy	14	piercing right upper lobe, crossing the oblique fissure into the lower lobe, emerging from the posterior aspect of the lower lobe
Sarper (52)	2003	46 M	scapula	right	linear	Steinmann pin	total	4	thoracotomy	N/A	right upper lung, the tip in contact with parietal pleura

Supplementary table to *Table 3* in the main article. We give additional information regarding side, type of osteosynthesis material, duration of hospitalisation and detailed anatomic regions for each case of migration.

Table S4 mediastinal migration

Author	Year	age gender	Origin of osteosynthesis material	side	Trajectory	Osteosynthesis material	state	Interval (months)	Operative technique	duration of hospitalization (days)	detailed region
Dutta (23)	2018	60 M	Acromioclavicular Joint	left	nonlinear	K wire	total	9	thoracoscopy	1	subaortic space
Foster (11)	2001	50 M	Acromioclavicular Joint	left	nonlinear	K wire	broken	60	neck incision	N/A	through the thyroid tissue, penetration of both sides of the trachea
Richardson (22)	1987	72 M	cervical spine	N/A	linear	Steinmann pin	total	4 days	bronchoscopy	N/A	stuck in left main bronchus, after penetration of posterior wall of the mid-trachea
Cabañero (27)	2018	64 F	clavicle	right	linear	K wire	total	6 weeks	thoracoscopy thoracotomy	3	posterior to the supra-aortic trunks, trachea, and esophagus
Orsini (53)	2012	58 M	clavicle	left	linear	K wire	total	72	sternotomy	N/A	through the ostium of the left subclavian artery, just above the aortic arch, in contact with the esophagus
Harmouchi (54)	2021	41 M	clavicle	right	linear	K wire	total	24	cervicotomy sternotomy	N/A	intratracheal lumen
Harmouchi (54)	2021	41 M	clavicle	right	linear	K wire	total	24	cervicotomy sternotomy	N/A	intratracheal lumen
Hegemann (29)	2005	59 M	clavicle	left	linear	K wire	total	6 weeks	thoracoscopy	5	trans mediastinal migration to the contralateral side
Nakayama (31)	2009	30 M	clavicle	right	linear	K wire	broken	8	thoracotomy	N/A	penetrating the right side of the trachea, tip of the wire reaching the left side of the trachea, adjacent to the aortic arch
Venissac (55)	2000	26 M	clavicle	left	nonlinear	K wire	broken	4	thoracoscopy	N/A	mediastinum, without contact of important structures
Venissac (55)	2000	20 M	clavicle	left	nonlinear	K wire	total	1	thoracotomy sternotomy	7	pin anteriorly to the ascending aorta, with one tip in close contact with the aortic wall
Wu (56)	2009	48 M	clavicle	left	linear	K wire	total	108	sternotomy	7	penetrating through the trachea, its tip passing into the innominate artery
Wada (57)	2005	84 M	clavicle	right	linear	K wire	total	24	shoulder incision	18	esophageal wall perforation, brachiocephalic artery perforation
Bezer (58)	2009	26 M	clavicle	left	linear	K wire	total	24	thoracoscopy sternotomy	N/A	trans mediastinal migration to the contralateral side
Schwartz (5)	2011	78 F	humeroscapular joint	left	linear	Steinmann pin	total	60	sternotomy	14	piercing the ascending aorta and the superior vena cava
Harle (59)	1967	70 F	proximal humerus	right	linear	Steinmann pin	total	15	N/A	N/A	contact with esophagus
Saxena (19)	2014	31 F	proximal humerus	right	linear	K wire	total	240	follow-up	N/A	posterior mediastinum across the midline in the pre vertebral space posterior to the esophagus and arch of aorta
Bang (50)	2017	26 F	proximal humerus	right	linear	K wire	total	6 weeks	thoracotomy	7	piercing through the upper lobe of the right lung, behind the pericardium and in front of the descending aorta
Mozaffari (60)	2014	87 M	shoulder	left	nonlinear	Steinmann pin	total	8 days	thoracoscopy	N/A	pin in the aortic adventitia, at the level of the arch between the arch and the pulmonary artery branch
Sharma (61)	2011	31 M	shoulder	left	nonlinear	Steinmann pin	broken	84	thoracotomy	N/A	perforating the innominate vein
Kumar (62)	2002	36 M	sternoclavicular joint	right	linear	K wire	total	4 weeks	sternotomy	N/A	anterior to the brachiocephalic vein, its tip adjacent to and abutting the aortic arch
Özbey (63)	2023	26 M	sternoclavicular joint	right	linear	K wire	total	156 m	sternotomy	5	close proximity to ascending aorta and left pulmonary artery.
Leonard (18)	1965	33 M	sternoclavicular joint	right	linear	K wire	total	17	pericardiocentesis	N/A	anterior part of the mediastinum, its point near the base of the left main pulmonary artery
Grauthoff (34)	1978	55 M	sternoclavicular joint	left	nonlinear	K wire	total	4 weeks	sternotomy	N/A	retrosternal intra-ascending aorta position
Leppilahti (64)	1999	48 M	sternoclavicular joint	right	linear	K wire	total	26 days	mediastinotomy	N/A	tip touching the aortic arch
Daus (65)	1993	45 F	sternoclavicular joint	right	linear	K wire	total	5 weeks	sternotomy	11	pin in the mediastinum, parallel to the aorta
Ballas (9)	2012	56 M	sternoclavicular joint	left	nonlinear	K wire	broken	60	laparotomy	N/A	trans mediastinal migration to the abdomen
Janssens de Varebeke (66)	1994	62 F	sternoclavicular joint	right	linear	K wire	broken	7	sternotomy	N/A	anterior mediastinum against the aortic arch, Kirschner's fragment localized in the pericardial cavity
Hazelrigg (67)	1994	64 M	sternum	N/A	nonlinear	sternal wire	broken	108	sternotomy	5	partially inside the aortic lumen
Schreffler (68)	2001	53 M	sternum	N/A	embolization	K wire	broken	24	sternotomy	5	embolization into the right ventricle, then embolization to the right middle pulmonary artery, then eroded into an adjacent bronchus

Supplementary table to *Table 4* in the main article. We give additional information regarding side, type of osteosynthesis material, duration of hospitalisation and detailed anatomic regions for each case of migration.

Table S5 intracardiac migration

Author	Year	age gender	Origin of osteosynthesis material	side	Trajectory	Osteosynthesis material	state	Interval (months)	Operative technique	duration of hospitalization (days)	detailed region
Wirth (20)	2000	37 M	Acromioclavicular joint	right	embolization	K wire	broken	240	follow-up	N/A	overlying the ventricular portion of the cardiac silhouette
Lenard (69)	2009	45 M	Acromioclavicular joint	right	embolization	K wire	total	60	sternotomy	N/A	intrapericardial with the sharp tip of the wire outside the myocardium, pointing at the right margin of the right ventricle
Tan (17)	2016	5 M	clavicle	right	linear	K wire	total	7 days	sternotomy	N/A	partially inside the ascending aorta
Nishizaki (70)	2007	82 M	clavicle	right	nonlinear	K wire	total	36	sternotomy	N/A	in the right ventricle
Goodsett (71)	1999	50 M	distal radius	left	embolization	K wire	broken	42	thoracotomy	N/A	posterior wall of the right ventricle
Seipel (72)	2001	50 M	distal radius	left	embolization	K wire	total	36	sternotomy	N/A	right ventricle
Ono (73)	2010	14 M	epiphysis of femur	N/A	embolization	K wire	total	6	sternotomy	N/A	fixed in the trabecular portion of the right ventricle
Leonardi (21)	2014	71 F	femur	left	embolization	K wire	broken	252	follow-up	N/A	into the anterior left ventricular myocardial wall at the atrioventricular level
Haapaniemi (74)	1997	45 F	index MCP joint	left	embolization	K wire	total	31	sternotomy	N/A	right ventricle, lodged among the trabeculae without any sign of penetration of the cardiac muscle
Biddau (75)	2006	47 M	patella	right	embolization	K wire	broken	156	sternotomy atriotomy	N/A	in the right ventricle of the heart
Park (76)	2011	60 M	pelvic bone	right	nonlinear	K wire	total	240	sternotomy	6	migrated wire at the apex of the right ventricle penetrating the epicardial fat layer
Hédon (77)	2015	79 F	proximal humerus	left	linear	K wire	total	24	sternotomy	N/A	perforating the inter-atrial septum
Georges (78)	2024	65 F	proximal humerus	left	nonlinear	K wire	total	3	thoracotomy	7	intra-pericardial
Medved (16)	2006	67 F	proximal humerus	right	linear	K wire	total	24	sternotomy	N/A	penetrating the cavity of right ventricle with 0.5 cm of its length pricked in the myocardium of the right ventricle
Stemberga (15)	2006	67 F	proximal humerus	right	nonlinear	K wire	total	24	autopsy	N/A	in the right atrium, trespassing posterior part of tricuspid valve, passing obliquely through right ventricle posterior wall
Zhang (79)	2014	50 M	ribcage	right	linear	K wire	total	32	sternotomy	7	right ventricle
Clark (14)	1974	18 M	sternoclavicular joint	right	linear	K wire	total	3	thoracotomy pericardiotomy	N/A	adjacent to the base of the heart and aortic root
Gulcan (80)	2005	44 F	sternoclavicular joint	right	linear	K wire	total	6	sternotomy	5	penetrating the right ventricle, within the pericardial sac
Liu (81)	1993	35 M	sternoclavicular joint	right	linear	K wire	total	2	sternotomy	N/A	penetrating pulmonary artery, intrapericardial
Tubbax (82)	1989	55 M	sternoclavicular joint	right	linear	K wire	total	8 days	sternotomy	14	in the right ventricle after having penetrated the pulmonary artery
Wang (83)	2021	55 M	sternoclavicular joint	right	linear	K wire	broken	5	sternotomy	7	located between the aorta and the pulmonary artery, behind the right auricle, intrapericardial
Levisman (84)	2010	64 M	sternum	N/A	nonlinear	Sternal wire	broken	84	sternotomy	N/A	embedded into the right ventricle wall adjacent to the LAD
Anić (85)	1997	48 F	trochanter major	right	embolization	K wire	total	66	sternotomy right atriotomy	10	right ventricle endocardial trabeculations near the tricuspid valve

Supplementary table to *Table 5* in the main article. We give additional information regarding side, type of osteosynthesis material, duration of hospitalisation and detailed anatomic regions for each case of migration.

Table S6 intrapleural migration

Author	Year	age gender	Origin of osteosynthesis material	side	Trajectory	Osteosynthesis material	state	Interval (months)	Operative technique	duration of hospitalization (days)	detailed region
Sananta (87)	2020	40 M	Acromioclavicular Joint	left	nonlinear	K wire	broken	24	thoracoscopy	3	partially inside the posterior cavum pleura, in the posterior aspect of left hemithorax
Abbas (88)	2009	27 M	Acromioclavicular Joint	left	nonlinear	K wire	broken	8	thoracoscopy	2	left pleural cavity
Aalders (89)	1985	19 M	Acromioclavicular Joint	right	linear	K wire	total	18	laminectomy thoracotomy	N/A	at the level of the second thoracic vertebra, projecting over both pulmonary apices
Bezer (58)	2009	26 M	clavicle	left	linear	K wire	total	24	thoracoscopy sternotomy	N/A	migrated to the opposite hemithorax
Mamane (90)	2009	34 M	clavicle	left	linear	K wire	total	2	supraclavicular incision	N/A	intrapleural, entering in the spinal canal in the left foramen of the thoracic vertebra
Ozarlan (91)	2014	49 F	hip	right	nonlinear	K wire	total	96	thoracotomy	4	right pleural cavity
Emiroğullari (92)	1999	45 M	proximal humerus	left	nonlinear	K wire	total	2	thoracotomy	9	left pleural cavity, in front of the lower lung lobe, with the sharp end downwards
Kim (41)	2000	55 F	proximal humerus	right	nonlinear	Steinmann pin	total	16	thoracotomy	N/A	right pleural cavity adjacent to the anterior basal segment of right lower lobe
Ullmer (93)	1998	80 F	proximal humerus	left	nonlinear	K wire	broken	36	thoracoscopy	N/A	in the left phrenico-costal angle
Julià (94)	2012	83 F	proximal humerus	left	linear	K wire	total	1	thoracotomy	3	through the left pleural space and left hemidiaphragm with its distal end located next to the spleen and its proximal end at the fifth intercostal space
Fowler (95)	1981	14 M	sternoclavicular joint	right	nonlinear	K wire	total	2	thoracotomy	N/A	Intrapericardial wire lying beneath the heart
Hamid (96)	2012	67 M	sternum	N/A	nonlinear	sternal wire	broken	4 weeks	sternotomy	N/A	left pleural cavity in contact with pleural parenchyma

Supplementary table to *Table 6* in the main article. We give additional information regarding side, type of osteosynthesis material, duration of hospitalisation and detailed anatomic regions for each case of migration.

Table S7 Spinal canal migration

Author	Year	age gender	Origin of osteosynthesis material	side	Trajectory	Osteosynthesis material	state	Interval (months)	Operative technique	duration of hospitalization (days)	detailed region
Aalders (89)	1985	19 M	acromioclavicular Joint	right	linear	K wire	total	18	laminectomy thoracotomy	N/A	second thoracic vertebra
Li (86)	2013	35 M	acromioclavicular joint	left	nonlinear	K wire	total	2	thoracoscopy	N/A	extended transversely across the spinal canal at the T2/3 level
Mankowski (97)	2016	34 M	acromioclavicular joint	left	linear	K wire	broken	84	neck incision	3	penetrating C6 vertebra, in direct contact with the vertebral artery without breaching the lumen
Mian (98)	2012	41 M	clavicle	left	linear	Steinmann pin	total	24	neck incision	N/A	entering the left C8 neural foramen and traversing the anterior aspect of the spinal canal
Loncán (99)	1998	22 M	clavicle	left	linear	K wire	total	2	supraclavicular incision	N/A	piercing the spinal canal through the T2-T3 left intervertebral foramen, penetrating into the center of the canal
Wang (100)	2010	28 F	clavicle	left	linear	K wire	broken	48	shoulder incision	N/A	penetrating the left intervertebral foramen, passing the vertebra canal transversely
Bennis (101)	2008	57 M	clavicle	left	linear	K wire	total	4	shoulder incision	N/A	cervicothoracic junction
Fransen (102)	2007	30 M	clavicle	left	linear	K wire	total	12	laminectomy	N/A	passing through the Th2 nerve root foramen, perforating the spinal cord
Regel (103)	2002	50 M	clavicle	right	nonlinear	K wire	broken	3	shoulder incision	N/A	right intervertebral foramen of C5/6, lying ventrally to the myelon in the epidural space
Tsai (104)	2009	49 M	clavicle	right	linear	Schanz screw	broken	98	shoulder incision	N/A	penetrating the lamina of the right C7
Gonsales (105)	2017	42 M	clavicle	left	linear	K wire	total	3	thoracotomy	N/A	penetrating at the T2-T3 level
Leppilahti (64)	1999	56 M	clavicle	right	linear	K wire	total	11 days	shoulder incision	N/A	tip lying on the anterior side of the cervical spine behind the trachea
Mamane (90)	2009	34 M	clavicle	left	linear	K wire	total	2	supraclavicular incision	N/A	penetrating the left foramen of the second thoracic vertebra
Bedi (51)	1997	8 M	proximal humerus	right	nonlinear	K wire	broken	1 week	thoracotomy	14	intervertebral space of thoracic 7th and 8th vertebrae
Mellado (43)	2004	85 F	proximal humerus	right	linear	K wire	total	10 days	thoracotomy	N/A	C7–T1 neural foramen
Sarper (52)	2003	55 F	shoulder	right	nonlinear	Steinmann pin	total	1	thoracotomy	6	adjacent to the eighth costovertebral joint
Furuhata (106)	2020	68 M	sternum	N/A	linear	K wire	broken	84	neck incision	7	penetrating the C6 vertebra, its tip located in the spinal canal with penetration of the spinal cord at the C5-6 level

Supplementary table to *Table 7* in the main article. We give additional information regarding side, type of osteosynthesis material, duration of hospitalisation and detailed anatomic regions for each case of migration.