Author Year Country Research Design Score Total Sample Size	Methods	Outcome
	Diagnostic Value	
Yasin et al., (2017) Pakistan Observational N=38	**Population**: *SCI (n=10):* Mean age=28.35±7.67yr; Gender: males=31, females=7; Level of injury: C=12, L=16; Mean time since injury=4.98±3.84d; AIS scale: NR. **Intervention:** Individuals suspected of SCI underwent magnetic resonance imaging (MRI) for diagnosis. **Outcome Measures:** Sensitivity; specificity; predictive value; diagnostic accuracy.	1. MRI is a highly sensitive and accurate technique 2. Sensitivity=96.55% 3. Specificity=88.89% 4. Predictive value=96.55% 5. Diagnostic accuracy=94.74%
Ghasemi et al., (2015) Iran Observational N=40	**Population**: SCI (n=40): Mean age(men)=43.56±18.82yr; Mean age(women)=48.47±20.45yr; Gender: males=25, females=15; Level of injury: C=3, T=9, L=14; thoracolumbarsacral=3; unaffected=11; Mean time since injury=≤24hr; AIS scale: NR. **Intervention:** Two stages of magnetic resonance imaging (MRI) was performed on all individuals (one with contrast and one without). MRI was obtained using a 1.5T system with a spine coil. Images were acquired using sagittal T1 and T2 sequences. Psychometrics were obtained for various spinal cord injury patterns. **Outcome Measures:** Specificity; positive predictive value (PPV); negative predictive value (NPV); positive likelihood (PL); negative likelihood (NL).	1. For SCI with edema, MRI without contrast had specificity, PPV, NPV, PL, and NL of 75%, 100%, 100%, 94.11%, and 68.4%, respectively. 2. For SCI with edema MRI with contrast had specificity, PPV, NPV, PL, and NL of 100%, 100%, 100%, 100%, and 0%, respectively. 3. For SCI with hemorrhage, MRI without contrast had specificity, PPV, NPV, PL, and NL of 100%,100%,100%, 100%, and 0%, respectively. 4. For SCI with hemorrhage, MRI with contrast had specificity, PPV, NPV, PL, and NL of 50%, 100%, 100%, 0.44%, and 13%, respectively. 5. For SCI with combination of hemorrhage and edema, MRI without contrast had specificity, PPV, NPV, PL, and NL of 0%, 100%, 0%, 0.60%, and 6%, respectively. 6. For SCI with combination of hemorrhage and edema, MRI with contrast had specificity, PPV, NPV, PL, and NL of 100%, 100%, 100%, 100%, and 0%, respectively.
Karpova et al., (2013) Canada Case series N=17	**Population:** *Cervical Myelopathy (n=17):* Mean age=54.5yr; Gender: males=13, females=4. **Intervention:** To assess the intra-and inter-observer reliability of commonly used quantitative magnetic resonance imaging (MRI) measures such as transverse area (TA), compression ratio (CR), maximum canal compromise (MCC), maximum spinal cord compression (MSCC). **Outcome Measures:** Intra-class correlation coefficients (ICC).	1. The mean±SD for intra-observer ICC was 0.88±0.1 for MCC, 0.76±0.08 for MSCC, 0.92±0.07 for TA, and 0.82±0.13 for CR. 2. Additionally, inter-observer ICC was 0.75±0.04 for MCC, 0.79±0.09 for MSCC, 0.80±0.05 for CR, and 0.86±0.03 for TA.
	Prognostication	
Seif et al., (2018) Switzerland Case Control	**Population**: SCI (n=24): Mean age=49.7±19.8yr; Gender: males=19, females=5; Level of injury: C=12, T=9,	1. There was a significant association between baseline APW and LEM at 2 mo (r^2=0.97, p=0.03).

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N=47	L=2, S=1; Mean time since injury=45.6±20.7d; AIS scale: A=6, B=5, C=4, D=9. Healthy controls (n=23): Mean age=35.9±10.9yr; Gender: males=13, females=10; Level of injury: N/A; Time since injury=N/A; AIS scale: N/A. **Intervention:** All participants underwent magnetic resonance imaging (MRI) using a 3T system. Sequences included T1-weighted 3D magnetization Prepared Rapid Acquisition Gradient-Echo (IMPRAGE) of the whole brain extending to the cervical C5 level (field of view=224 X 256, matrix=224 X 256, repetition time/echo (TR/TE)=2420/4.18 ms, bandwidth=150 hz/pixel). Microstructural changes were assessed with three different 3D multi-echo fast low-angle shot (FLASH) gradient-echo sequences. Participants were assessed at baseline, 2, 6, 12, and 24 mo post-SCI. **Outcome Measures:** Cross-sectional **s**pinal cord area (SCA); anterior-posterior width (APW); left-right width (LRW); lower extremity motor score (LEM); Microstructural parameters: magnetization transfer (MT); longitudinal relaxation rate (R1); effective transverse relaxation rate (R2).	2. There was also a significant association between RI of the cord and pinprick score at 12 mo (r^2=0.71, p=0.04). 3. SCA (p=0.004) and APW (p=0.005) were significantly lower compared to controls at baseline. There was no significant difference in LRW between the two groups at baseline (p=0.67). 4. There were no significant differences in microstructural measures of MT, R1, and R2 in the cervical cord when comparing SCI to controls (p>0.05).
Dalkilic et al., (2018) Canada Observational $N_{Initial}$=36 N_{Final}=34	**Population**: SCI (n=36): Mean age=42.1±13yr; Gender: males=23, females=13; Level of injury: C=36; Mean time since injury=12.87hr; AIS: A=20, B=7, C=9. **Intervention:** Individuals were assessed using magnetic resonance imaging (MRI) pre-operatively with a 1.5T MRI system. Conventional MRI sequences included were fast-spin-echo (FSE) T1-weighted sagittal image with repetition time/echo time(TR/TE) =533/10ms, T2-weighted sagittal image with TR/TE=3000/84ms, FSE T2-weighted axial image with TR/TE=3390/98ms, and T2 gradient echo weighted axial image with TR/TE=1030/24ms. AIS grade was assessed pre-operatively (baseline) and 6mo post-injury. Outcome measures below were assessed by MRI. **Outcome Measures:** Intramedullary lesion length (IMLL); hematoma length; CSF effacement length; cord expansion length; maximal cord compression (MCC).	1. Hematoma length (p=0.006), CSF effacement length (p=0.007), and cord expansion length (p=0.031) differed significantly between individuals with baseline AIS grades A, B, and C. There were no significant differences in IMLL and MCC (p>0.05). 2. A logistic regression model of MRI found that only CSF effacement and hematoma length were statistically significant predictors of baseline AIS grade (p<0.05). The model had 72.2% accuracy for AIS grade classification. 3. IMLL (p=0.031) and hematoma length (p=0.002) were significantly higher in individuals who converted their AIS grade within 6mo compared to those who did not. CSF effacement, cord expansion length, and MCC did not differ significantly between the two groups (p>0.05).
Aarabi et al., (2017) USA	**Population**: SCI (n=100): Mean age=39.5±16.8yr; Gender: males=89,	1. IMLL was a significant predictor of AIS impairment scale grade

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Observational N=100	females=11; Level of injury: C=100; Time since injury: ≤12hr=51, >12hr=49; AIS: A=52, B=29, C=19. **Intervention:** Individuals who underwent surgical spinal cord decompression were included in this longitudinal, retrospective study. AIS grade was re-evaluated at 6wk, 3mo, 6mo, and 12mo following discharge. Post-operative magnetic resonance imaging (MRI) was used to assess outcome measures. Outcome measures below were assessed by MRI. **Outcome Measures**: AIS grade conversion at 6mo post-surgery; Intramedullary lesion length (IMLL); evidence of decompression; presence of intramedullary hematomas.	conversion at 6mo in univariate ($p<0.001$) and sole predictor in multivariate (OR=0.950, CI: 0.931-0.969) analysis. The multivariate model predicted 5% and 40% decreases in the odds of AIS scale grade conversion for 1-and 10mm increases in IMLL, respectively. 2. Univariate analysis showed that the presence of intramedullary and evidence of decompression were significantly related to AIS grade conversion at 6mo ($p<0.001$), however, were not significant in multivariate analysis (stepwise multiple logistic regression) ($p>0.05$).
Martinez-Perez et al., (2017) Canada Observational N=86	**Population**: Incomplete SCI (n=86): Mean age=47.6yr (range=18-87); Gender: males=68, females=18; Level of injury: C=86; Time since injury=<72hr for all; AIS at admission: B=12, C=29, D=35, E=38. **Intervention:** This retrospective review examined individuals who presented with acute incomplete cervical SCI secondary to blunt trauma. Magnetic resonance imaging (MRI) was performed at initial diagnosis using a 1.5T system. Axial and sagittal planes had a slice thickness of 3mm. Image sequences included axial T1-weighted, T2-weighted, and gradient echo images, as well as sagittal T1-weighted, T2-weighted, and short tau inversion recovery (STIR). AIS assessments were done initial examination and 1yr follow-up. Outcome measure below were assessed by MRI. **Outcome Measures:** Length of edema (LOE); intramedullary hemorrhage; AIS	1. LOE >36mm was significantly associated with poor neurological outcome (i.e., no improvement in AIS). 2. There was no significant difference in intramedullary hemorrhage when comparing individuals who had AIS improvement and those who did not ($p>0.05$).
Matsushita et al., (2017) Japan Observational N=102	**Population**: SCI (n=102): Mean age=62.36yr (range=16-86); Gender: males=88, females=14; Level of injury: C=102; Time since injury=<72h for all AIS scale: A=32, B=15, C=42, D=13. **Intervention:** Individuals presenting with acute cervical SCI were included in the study. Magnetic resonance imaging (MRI) was performed using a 1.5T system with sagittal T2-weighted images (fast-recovery fast spin echo, echo train length=15, receiver bandwidth=150Hz/Px, matrix=384 X 229, section thickness=3mm, field of view=24cm). American Spinal Injury Association motor score (AMS) and modified Frankel D grade were assessed	1. There was a significant negative correlation between ISI and AMS at both admission ($r=-0.3766$, $p<0.001$) and discharge ($r=-0.4240$, $p<0.001$) for individuals admitted within 1 day of SCI. 2. There was also a significant negative correlation between ISI and AMS at both admission ($r=-0.6840$, $p<0.001$) and discharge ($r=-0.5293$, $p<0.01$) for individuals admitted 2-3 days of SCI. 3. Receiver operating characteristic curve analysis determined an optimal ISI cut-off of 45mm for high versus low Frankel D score (i.e., not walking versus walking,

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	at admission and discharge. **Outcome Measures:** Increased intramedullary signal intensity (ISI); American Spinal Injury Association score (AMS); Frankel D score.	respectively) in individuals who were admitted 2-3 days after SCI. With this cut-off, there was a significant positive correlation between ISI and being able to walk (p<0.001).
Song et al., (2016) Korea Observational N=102	**Population**: Complete SCI (n=10): Mean age=55.4yr (range=23-79); Gender: males=8, females=2; Level of injury: C=10; Time since injury=<12hr for all; AIS scale: A=10. Incomplete SCI (n=75): Mean age=57.2yr (range=28-87); Gender: males=65, females=10; Level of injury: C=75; Time since injury=<12hr for all; AIS scale: B=NR, C=NR, D=NR. Neurologically intact (n=17): Mean age=54.3yr (range=24-71); Gender: males=14, females=4; Level of injury: C=17; Time since injury=<12hr for all; AIS scale: E=17. **Intervention:** Medical records of individuals who underwent magnetic resonance imaging (MRI) scans for suspected spinal cord injury were assessed. **Outcome Measures:** Maximum spinal canal compression (MSCC); maximum cord compression (MCC); intramedullary lesion length (IMLL); intramedullary hemorrhage; spinal cord edema.	1. There was no significant difference in MSCC across the three groups (p=0.085). 2. Complete SCI showed significantly higher MCC compared to the other two groups (p<0.001). 3. Intramedullary hemorrhage and edema had significantly greater incidence in complete SCI compared to incomplete SCI and neurologically intact individuals (p<0.001).
Zohrabian et al., (2016) USA Observational N=108	**Population**: SCI (n=108): Mean age=48.9±20.9yr; Gender: NR; Level of injury: C=108, L=16; Time since injury=<72hr for all; AIS scale: NR. **Intervention:** Individuals suspected of SCI underwent neurological examination and diagnostic-quality magnetic resonance imaging (MRI) of the cervical spine. **Outcome Measures:** upper and lower boundaries of edema; lesion epicenter; upper and lower boundaries of cord hemorrhage; neurological level of injury (NLI).	1. All outcome measures showed statistically significant positive correlations with NLI. 2. Upper (r=0.72, p<0.01) and lower (r=0.61, p<0.01) boundaries of hemorrhage had the strongest correlation with NLI. 3. Bland-Altman analysis demonstrated that upper boundary of cord hemorrhage demonstrated the best agreement with NLI (p<0.01).
Schroeder et al., (2016) USA Observational N=75	**Population:** *Increased T2 signal (n=32):* Mean age: 57.1yr; Gender: males=19, females=13; Injury etiology: fall=24, motor vehicle accident=6, diving=; 2 Level of severity: mean Glasgow coma scale=15.0, mean injury severity score=22.2. *No increase in T2 signal (n=43):* Mean age: 57.3yr; Gender: males=31, females=12; Injury etiology: fall=31, motor vehicle accident=8, diving=2, sports=1, other=1; Level of severity: mean Glasgow coma scale=15.0, mean injury severity	1. Individuals in the increased signal group had more severe neurological injury on AMS at admission (p=0.01). 2. Throughout the wk, individuals with increased signal intensity maintained stable AMS whereas individuals without increased signal intensity on MRI declined within the first wk (p=0.07). 3. Individuals with increased signal intensity tended to experience less severe mechanism of injury through less major (p=0.09) and minor

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	score=16.8. **Intervention:** Individuals with central cord syndrome were stratified based on presence of signal intensity on magnetic resonance imaging (MRI). Physician progress notes were reviewed for outcomes 1 wk post-injury. **Outcome Measures:** American Spinal Injury Association (ASIA) Motor Score (AMS), Surgery, Severity of injury.	(p=0.15) injuries. 4. Incidence of surgical treatment and decompression was similar between both groups (p=0.99, p=0.10). 5. Individuals with increased signal intensity on MRI spent longer time in the ICU (p=0.001), but there was no difference in length of stay (p=0.22). 6. There was no significant relationship of age, sex, injury severity score, stenosis, or surgery with AMS (p>0.05).
Mabray et al., (2016) USA Observational N=25	**Population**: SCI (n=25): Mean age=38.32±15.74yr; Gender: males=17, females=8; Level of injury: T=24, without detectable injury=1; Mean time since injury=14.68±18.56hr; AIS at admission: A=11, B=2, C=, D=6, E=5. **Intervention:** This retrospective cohort study examined individuals who presented with acute thoracic or thoracolumbar SCI. MRI was performed at initial diagnosis using a 1.5T system. Images included sagittal T1 (slice thickness=3 mm, time to repetition/time to echo (TR/TE)=520-630/9-15ms, echo train length (ETL)=3, field of view (FOV)=30 cm2, acquisition matrix=512 X 512), sagittal T2 (slice thickness=3mm, TR/TE=3100-4000/105-120ms, ETL=19-21, FOV=30cm2, acquisition matrix=512 X 512), and axial T2 sequences (slice thickness=4 mm, TR/TE=4000-4800/102-120 ms, ETL=25, FOV=18 cm, acquisition matrix=512 X 512). AIS was assessed upon admission and at discharge. Outcome measures below were assessed by MRI. **Outcome Measures:** Brain and Spinal Cord Injury Center (BASIC) grade; Maximum canal compromise (MCC); Maximum spinal cord compression (MSCC); greatest longitudinal extent of injury (LEI); sagittal grade.	1. Sagittal grade (rho=-0.83, p<0.001), LEI (rho=-0.83, p<0.001), and BASIC (rho =-0.93, p<0.001) showed significant negative correlations with AIS at discharge. There were no significant correlations between AIS score at discharge and both MCC and MSCC (p>0.05). 2. In a multi-variable optimal scaled regression model, BASIC was the only statistically significant predictor of AIS at discharge (p=0.001).
Wang et al., (2016) China Observational N=35	**Population**: SCI (n=35): Mean age=57.2yr (range=42-69); Gender: males=21, females=14; Level of injury: C=35; Time since injury=NR; AIS scale: NR. **Intervention:** Imaging was performed on a 3.0T dual gradient superconductor MR with a gradient strength of 40mT/m and switching rate of 150mT/ms^{-1}. Sagittal flair-T_1W_1 (repetition time/echo time(TR/TE)=3200/116.8ms, section thickness=3mm, interlamellar spacing=1mm, field of view	1. There were no significant correlations between MRI and motor score, sensory score, or AIS before and after surgery (p>0.05).

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	(FOW)=24X24 mm, image matrix=320X224, number of signals averaged (NEX)=2), sagittal FRFSE-T_2W_1 (TR/TE=2698/25.8ms, section thickness=3 mm, interlamellar spacing=1mm, FOV=240X240, image matrix=320X224, NEX=2), and axial FRFSE-T_2W_1 (TR/TE=3200/121ms, section thickness=4mm, interlamellar spacing=0.5mm, bandwidth=41.7kHz, FOV=180X180mm, image matrix=288X224, NEX=4) sequences were acquired for all individuals. MRI grading was performed by two radiologists; Grade 1, 2, and 3 constituted no static compression on spinal cord (no abnormal signals on sagittal T_1W_1 and T_2W_1), compression on spinal cord (normal sagittal T_1W_1 + increased signal intensity (ISI) on sagittal T_2W_1), and obvious compression on spinal cord (Low signal intensity on T_1W_1 + ISI on T_2W_1, respectively. Outcome measures were evaluated before surgery and 1 yr after surgery. **Outcome Measures:** Motor score; sensory score; American Spinal Injury Association index score (AIS).	
Wilson et al., (2012) Canada Case Series N=376	**Population:** *SCI (n=736):* Mean age=43.2yr; Gender: males=294, females=82; Level of severity: AIS A=136, AIS B=63, AIS C=58, AIS D=119; Mean time since injury=76.1hr. **Intervention:** Individuals received MRI following traumatic SCI. Outcomes were assessed at baseline and 1yr follow-up. **Outcome Measures:** MRI signal, American Spinal Injury Association Impairment Scale (AIS), American Spinal Injury Association Motor Scale (AMS), Functional Independence Measure (FIM).	1. MRI signal characteristics consistent with spinal cord edema or hemorrhage predicted worse functional outcome. 2. Parameters for predicting FIM motor score at 1yr (b=50.28) were MRI signal (m=4.83, p=0.19), AIS grade (m=12.47, p<0.01), AMS score (m=9.17, p<0.01), and age (m=-0.33, p<0.01). 3. Parameters for predicting FIM score at 1yr (b=-2.93) were MRI signal (m=-0.29, OR=0.75, p=0.54), AIS grade (m=1.36, OR=3.90, p<0.01), AMS score (m=1.35, OR=3.86, p<0.01), and age (m=-0.03, OR=0.97, p<0.01).
Miyanji et al., (2007) Canada Observational N=100	**Population**: SCI (n=100): Mean age=45yr (range=17-96); Gender: males=79, females=21; Level of injury: C=100; Median time since injury=24hr; AIS scale: A=26, B-D=51, E=22, Unknown=1. **Intervention:** Individuals with SCI were recruited as participants for this prospective study. Comparisons were made among injury severity American Spinal Injury Association (ASIA) A, B-D, and E. All individuals underwent MRI. Neurological assessment was done at	1. Frequency of intramedullary hemorrhage, edema, and cord swelling were more common in ASIA A versus ASIA B-D (p<0.001). Moreover, they were directly correlated with SCI severity (p<0.001). 2. MCC and MSCC were more substantial in ASIA A compared to ASIA B-D (r^2=0.222, p=0.005; r^2=0.171, p=0.002, respectively). 3. Lesion length was significantly greater in ASIA A compared to ASIA

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	baseline (time of MRI) and last clinical visit. **Outcome Measures:** Maximal canal compromise (MCC); maximum spinal cord compression (MSCC); lesion length; American Spinal Injury Association (ASIA) motor score; presence of: intramedullary hemorrhage, edema, cord swelling (focal widening of cord).	B-D (r^2=0.343, p=0.005). 4. Step-wise multivariate regression found that the best model for predicting baseline ASIA included MCC, MSCC, and cord swelling. 5. Step-wise multivariate regression adjusted for baseline ASIA motor score found that only intramedullary hemorrhage and cord swelling were predictive of follow-up ASIA motor score.
Boldin et al., (2006) Austria Observational N=29	**Population**: SCI with Hemorrhage (n=17): Mean age=35.4±12.3yr; Gender: NR; Level of injury: C=17; Median time since injury=10(range=5-12)d; AIS scale: A=8, B=8, C=1. SCI without Hemorrhage (n=12): Mean age=55±19.3yr; Gender: NR; Level of injury: C=12; Median time since injury=6(range=5-11)d; AIS scale: B=3, C=7, D=2. **Intervention:** Participants with closed cervical SCI were recruited for this prospective study. MRI was performed on all participants. Neurological impairment was assessed at time of MRI and at median follow up of 35 mo (range=24-65). **Outcome Measures:** hemorrhage length; edema length; American Spinal Injury Association (ASIA) classification; recovery rate (RR) of the following: motor score; sensory score; pin prick score.	1. Participants with spinal cord hemorrhage had significantly longer edema (p=0.002) and more severe ASIA scores (p<0.001). 2. Participants with complete motor SCI were significantly more likely to have indications of hemorrhage compared to those with incomplete lesions (p<0.001). 3. Baseline motor, pin prick, and sensory scores were significantly lower in the presence of hemorrhage (p=0.006; p=0.001; p=0.001, respectively). 4. RR of pin prick and sensory scores were significantly lower in participants with hemorrhage (p=0.008; p=0.011, respectively). There was no significant difference in RR of motor score between hemorrhage versus no hemorrhage (p>0.05). 5. ANOVA revealed statistically different edema lengths among the levels of ASIA score (p=0.001). ASIA A was statistically longer than ASIA C, D, and E. There was no difference in edema length when comparing ASIA A to B (p>0.05). 6. Hemorrhage length was longer in complete SCI (ASIA A) compared to incomplete SCI (ASIA B-E) (p=0.002). 7. Logistics regression revealed that length of edema was the only predictive measure for all participants (hemorrhage and no hemorrhage). Each mm increase in edema resulted in a 1.15 (1.03-1.29) increased rate of retaining a complete SCI (p=0.022).
Shepard & Bracken (1999) USA Observational N=191	**Population**: SCI (n=191): Mean age=NR; Gender: males=162, females=29; Level of injury: NR; Time since injury: ≤9hr=99, >9hr=92; Injury severity: Complete=75, Incomplete=87,	1. Participants characterized with a complete SCI based on radiologic and neurologic examination were significantly more likely to have spinal cord hemorrhage compared

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	Normal=29. **Intervention:** This was a retrospective review of participants from another study. Participants who received MRI within 72hr of injury were included in this study. Participants were assessed neurologically based on responses to pin prick, light touch, and motor function at baseline and at 6wk follow-up. **Outcome Measures:** Positive MRI response of: hemorrhage, contusion, edema; neurological assessment (see intervention).	to those classified as neurologically normal on motor function but with impaired sensation (p=0.01). 2. There was no significant difference in the presence of contusion and edema when comparing complete SCI to incomplete SCI (p>0.05). 3. Participants whose MRI imaging indicates hemorrhage or contusion are significantly more likely to have lower motor, pin, and touch scores at baseline (p<0.05). However, there are no significant differences for participants with edema (p>0.05). 4. There was no statistical difference in recovery of pin, motor, and touch scores at 6wk when comparing participants who have hemorrhage, contusion, or edema (p>0.05). 5. A logistic regression adjusting for neurological examination scores at baseline found that there were no significant increased odds for a complete spinal cord injury in the presence of hemorrhage, contusion or edema (p>0.05). 8. There was no significant difference in motor function and sensory recovery at 6wk when comparing participants with hemorrhage, contusion, and edema (p>0.05).
Selden et al., (1999) USA Observational N=55	**Population:** *Cervical Myelopathy (n=55):* Mean age: 29.2yr; Gender: males=36, females=19; Injury etiology: motor vehicle accident=32, diving accident=11, fall=9, other=3; Level of injury range: C2-T1; Level of severity: Frankel grade A=32, B=9, C=8, D=6; Time since injury range: <17hr. **Intervention:** Individuals with traumatic cervical myelopathy underwent magnetic resonance imaging (MRI) of the spine. Outcomes were assessed at admission and at the most recent follow-up visit an average of 18.5mo. **Outcome Measures:** Frankel Grade, Medical Research Council (MRC) motor grades, Spinal cord length and diameter, Presence of hematoma, edema, and hemorrhage.	1. Abnormal T2-hyperintensity MRI images representing edema were present in 54 of 55 individuals. 2. Rostrocaudal length of signal changes, but not spinal cord swelling or maximal diameter, was significantly correlated with poor neurological function on Frankel Grades at admission (p=0.001). 3. Abnormal T2-hypointensity representing intra-axial hemorrhage was present in 22 individuals (40%), all which had poor Frankel Grade A or B injuries on admission and this was significantly different than those without hypointense signals (p=0.001). 4. Rostrocaudal length of hemorrhage signal changes were significantly correlated with worse Frankel Grades after MRI (p=0.049), but not at follow-up. 5. Rostrocaudal length of edema, but not maximal diameter or length, was significantly correlated with worse Frankel Grade at the follow-up

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		(p=0.036). 6. The strongest predictor of neurological outcome was Frankel Grade at presentation (p<0.001). 7. Hemorrhage on MRI scans were correlated with motor-complete injury at admission and associated with poor long term Frankel Grade scores. 8. There was a decrease in Frankel Grade at admission to follow-up for rostrocaudal length of hematoma (p=0.028), compression via extra-axial hematoma (p=0.077) and rostrocaudal length of edema (p=0.071). 9. There was a significant negative correlation between length of spinal edema on MRI and total motor score improvements on MRC (p=0.041).
Flanders et al., (1996) USA Case Series $N_{Initial}$=118 N_{Final}=104	**Population:** *SCI (n=104):* Mean age: 34 yr; Gender: males=91, females=13; Injury etiology: motor vehicle accident (n=49), fall (n=27), sport (n=8), other (n=20); Level of injury: cervical; Level of severity: AIS A=43, B=23, C=28, D=10; Time since injury: <1wk. **Intervention:** Individuals with cervical SCI who underwent MRI were retrospectively analyzed for prediction of motor recovery. **Outcome Measures:** American Spinal Injury Association Motor Score.	1. Individuals with spinal cord hemorrhage had significantly worse upper and lower motor scores at the time of injury and at 12mo (p<0.001). 2. Individuals without spinal cord hemorrhage had little recovery of lower extremity function. 3. Upper extremity function improved in all individuals (p<0.001); however, individuals without hemorrhage showed the largest improvements.
Takahashi et al., (1993) Japan Observational N=49	**Population:** *SCI (n=29):* Mean age=47.7 yr; Gender: males=42, females=7. **Intervention:** Individuals received MRI within 1wk of SCI. Some individuals (n=25) received follow-up MRI. All individuals were classified based on MRI pattern: Type 0 for T1/T2WI isointensity, Type I for T1WI isointensity and T2WI hyperintensity, Type II for T1WI hypointensity and T2WI hyperintensity, and Type III for T1WI hyperintensity. **Outcome Measures:** MRI pattern, Signal intensity, Cord compression, Recovery.	1. Individuals presented with compression of varying degrees: none (n=5), minimal (n=7), moderate (n=22), or severe (n=15). Most common causes were subluxation (n=17) and fracture (n=11). 2. Individuals initially presented with the following MRI patterns: Type 0 (n=13), Type I (n=30), Type II (n=1), and Type III (n=5). They later presented with the following patterns: Type 0 (n=4), Type I (n=8), and Type II (n=13). 3. Individuals showed recovery of varying degrees: none (n=22), some recovery (n=16), or complete recovery (n=11). 4. Initial MRI pattern was associated with recovery as follows: Type 0 had 92%, Type I had 53%, and both Types II and III had 0%. 5. Subsequent MRI pattern was associated with recovery as follows: Type 0 had 75%, Type I had 63%, and Type II had 69%.

Author Year Country Research Design Score Total Sample Size	Methods	Outcome
		6. Initial T2WI high intensity area was associated with recovery as follows: <1 vertebral body was 100%, 1-2 vertebral bodies was 88%, and >2 vertebral bodies was 20%. 7. Subsequent T2WI high intensity area was associated with recovery as follows: <1 vertebral body was 100%, 1-2 vertebral bodies was 67%, and >2 vertebral bodies was 0%. 8. Compression was associated with recovery as follows: severe had 33%, moderate had 55%, minimal had 71%, and none had 100%.
Schaefer et al., (1992) USA Observational N=57	**Population**: Group 1 (n=21): Mean age=27.2yr; Gender: NR; Level of injury: C=21; Time since injury=NR; Mean American Spinal Injury Association (ASIA) motor score: 12.1. Group 2 (n=17): Mean age=43.5yr; Gender: NR; Level of injury: C=17; Time since injury=NR; Mean ASIA motor score=28.6. Group 3 (n=19): Mean age=38.4yr; Gender: NR; Level of injury: C=19; Time since injury=NR; Mean ASIA motor score=38.3. **Intervention:** Individuals with closed cervical spinal cord injuries were recruited as participants for this study. All participants underwent MRI. Neurological assessment (ASIA motor score) was assessment at baseline (time of MRI) and at follow-up. Participants were divided into three groups based on MRI findings. Group 1 consisting of patterns characteristic of intramedullary hematoma; group 2 had intramedullary edema over more than one spinal region without hemorrhage; group 3 had intramedullary edema restricted to one spinal segment or less. **Outcome Measures:** ASIA motor score; Median percent recovery.	1. Group 1 had no statistically significant improvement in ASIA motor scores at follow-up (p>0.05). 2. Group 2 had significantly greater median recovery score compared to group 1 (p<0.02). 3. Group 3 had significantly greater median recovery score compared to both group 1 and 2 (p<-.001; p<0.01, respectively). 4. Baseline median ASIA motor score was significantly greater than group 1 (p<0.001). However, there was no difference in baseline ASIA motor score when comparing group 3 to 2 (p>0.05).