Author Year Country Research Design Score Total Sample Size	Methods	Outcome
Patchell et al. (2005) USA RCT PEDro=6 N=101	**Population:** Injury etiology: Tumour; Median level of severity: Frankel D. All individuals had metastatic epidural spinal cord compression. *Surgery and Radiotherapy (S+RT, n=50):* Mean age: 60.0 yr; Gender: males=33, females=17; Level of injury: Cervical=8, T1-T6=20, T7-T12=22; Mean time since injury: 3 mo. *Radiotherapy (RT, n=51):* Median age: 60.0 yr; Gender: males=37, females=14; Level of injury: Cervical=5, T1-T6=18, T7-T12=28; Mean time since injury: 7 mo. **Intervention:** Participants were randomized to S+RT or RT alone. S+RT were operated within 24 hr of admission via spinal cord decompression and tumour stabilization surgery, followed by RT within 14 days. RT was administered within 24 hr at 30 Gy in 10 fractions. All participant received 100 mg of dexamethasone, followed by 24 mg every 6 hr until S+RT/RT. Corticosteroids were reduced after S+RT/RT but continued until study completion. Outcomes were assessed at baseline, during therapy, 1 day post treatment, and every 4wks until end of trial. **Outcome Measures:** Frankel Grade, American Spinal Injury Association Motor Score (AMS), Survival rates, Ambulation status, Urinary continence, Medication use.	1. Ambulation improved in 84% of individuals in S+RT and 57% in RT. This difference was significant between groups (p<0.001). 2. Individuals in S+RT retained ambulation significantly longer than RT (median 122 versus 13 days, p=0.003). 3. Longer ambulation time was significantly associated with surgery (p=0.0017) and Frankel Grade at pre-treatment (p=0.0008). 4. Ambulatory participants at pre-treatment were able to regain walking ability in 94% in S+RT and 74% (p=0.024) of RT alone. Within this subset, surgery (p=0.0048), Frankel Grade (p=0.016) and breast tumour (p=0.029) were associated with longer ambulation times. 5. Non-ambulatory participants at pre-treatment were able to regain walking ability in 62% of S+RT and 19% of RT (p=0.012). Individuals within this subset walked longer in S+RT compared to RT (median 59 vs 0 days, p=0.04). 6. S+RT significantly improved continence (p=.016), muscle strength on AMS (p=0.001), functional ability on Frankel (p=0.0006) survival time (p=0.033), and reduced use of corticosteroids and opioid analgesics (p=0.0093) compared to RT alone. 7. The trial was stopped early by the data safety and monitoring committee due to proven superiority of the S+RT.
Rades et al. (2010) Germany Case Series N=324	**Population:** *Surgery and Radiotherapy (S+RT, n=108):* Age: ≤63 yr=55, ≥64 yr=53; Gender: males=73, females=35; Injury etiology: Tumor; Level of severity: Eastern Cooperative Oncology Group (ECOG) 1-2=48, 3-4=60. *Radiotherapy (RT, n=216)*: Age: ≤63 yr=55, ≥64 yr=53; Gender: males=146, females=70; Injury etiology: Tumor; Level of severity: ECOG 1-2=97, 3-4=119. **Intervention:** Participants with metastatic spinal cord compression (MSCC) that underwent decompressive surgery followed by	1. Postoperative motor function was associated with ECOG (p<0.001), type of tumor (p<0.001), number of vertebrae involved (p=0.004), presence of visceral metastases during RT (p<0.001), and preoperative ambulatory status (p<0.001). 2. Ambulation rates post intervention were 69% in S+RT, where 30% of previously non-ambulatory individuals regained ability to walk. Within RT alone, 68% were

	RT were retrospectively analyzed. RT was applied a median of 2 wk postoperatively to the midplane or posterior edge of the vertebral body. Some participants also received stabilization of vertebrae (n=70) or a laminectomy (n=38). Each participant was matched to two participants from a cohort treated with RT alone. All participants received 12-32 mg of dexamethasone per day. Outcomes were assessed preoperatively and up to 6 mo after RT. **Outcome Measures:** Local control of MSCC, Motor function, Ambulation rate, Survival rate.	ambulatory post intervention and 26% regained ability to walk. 3. Improvement in local control was significantly associated with absence of visceral metastases (p=0.003). 4. Improved survival rates were significantly associated with females, better ECOG score, one to two vertebral involvement, absence of other bone and visceral metastases, favourable type of tumour, long intervals between diagnosis and compression, preoperative ambulation, slower development of motor deficits, and longer RT administration (all p<0.001).
Kondo et al. (2008) Japan Case Series N=96	**Population:** Median age: 64.0 yr; Gender: males=61, females=35; Injury etiology: Tumor; Level of injury: C1-L1; Level of severity: Frankel A=1, B=18, C=88. **Intervention:** Participants that underwent posterior decompressive surgery followed by intraoperative radiotherapy (IORT) for epidural metastatic spinal tumors were retrospectively reviewed. IORT consisted of a single dose (20-30Gy) of electron beam irradiation to the lesion for 5 min. Total number of surgeries performed was 107. Outcomes were assessed preoperatively, postoperatively, and at a follow-up period ranging from 0.6-107 mo. **Outcome Measures:** Pain, Performance status (PS), Frankel Grade.	1. Pain improved in 46% of cases, and in 60% when drug dose reductions were considered. 2. PS improved by one rank in 88% of surgeries. 3. Neurological status improved by one Frankel Grade in 89% of cases. 4. Postoperatively, 80% of participants were able to walk. At long-term follow-up, abasia returned in 55% of these participants. 5. Participants with preoperative Frankel C classification had postoperative ambulation rate of 88%. Those that did not regain ambulation had worsening PS postoperatively. 6. Of those that survived more than 6 mo (n=60) in Frankel C subgroup, 98% were ambulatory by follow-up. This value was significantly higher than those that did not survive (p<0.001). 7. Postoperative ambulation was significantly associated with preoperative PS and neurological status (p<0.001) and visceral metastasis to vital organs (p=0.0069).
Furlan et al. (2012) Canada Cost-Utility Analysis of Patchell et al. (2005) N=101	**Population:** Injury etiology: Tumour; Median level of severity: Frankel D. All individuals had metastatic epidural spinal cord compression. *Surgery and Radiotherapy (S+RT, n=50):* Mean age: 60.0 yr; Gender: males=33, females=17; Level of injury: Cervical=8, T1-T6=20, T7-T12=22; Mean time since injury: 3 mo. *Radiotherapy (RT, n=51):* Median age: 60.0 yr; Gender: males=37, females=14; Level of injury: Cervical=5, T1-T6=18, T7-T12=28; Mean time since injury: 7 mo.	1. S+RT costed $1,215,514 US per QALY gained whereas RT alone costed $1,017,373 US per QALY.The expected effectiveness for S+RT was 0.57 QALY compared to 0.46 QALY for RT alone. 2. ICER of S+RT compared to RT alone was $250,307 US, but analyses determined that no therapy was dominant. 3. From baseline analyses, RT alone was more cost-effective than S+RT at WTP of $50,000 US. From a one-way

	Intervention: An analytic decision model was designed to compare cost-utility analyses between S+RT and RT alone for individuals with metastatic spinal cord compression. Costs for both treatment approaches stemmed from physician fees (Ontario Health Insurance Plan) and hospital fees (Ontario Case Costing Initiative). Baseline and sensitivity analyses were performed. **Outcome Measures:** Quality-Adjusted Life Year (QALY), Incremental Cost-Effectiveness Ratio (ICER), Cost-Effectiveness Acceptability Curve (CEAC), Willingness to Pay (WTP).	sensitivity analysis, S+RT became cost-effective at the threshold of $50,000 US when initial costs of S+RT within first 60 days was less than $29,439 US. 4. Monthly hospice care, from a two-way sensitivity analysis, favoured RT alone. There was a small chance for non-ambulatory individuals with urinary incontinence in S+RT to have higher utility than those in RT alone. 5. Upon Monte Carlo simulation, probabilistic sensitivity analyses revealed that S+RT was more effective than RT alone: S+RT was more cost-effective in 24.02% of the simulations at WTP of $50,000 US. 6. CEAC revealed 55.9% of ICERs were under $100,000 US per additional QALY. 7. Portion of ICERs covered by WTP reached a maximum of 91.1% at $1,604,800 US per one additional QALY.