Is there a right time for surgery in paraplegic patients secondary to non traumatic spinal cord compression?

Há um período exato para cirurgia em pacientes com paraplegia secundária à compressão medular não traumática?

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ABSTRACT

Paraplegia is a well-defined state of complete motor deficit in lower limbs, regardless of sensory involvement. The cause of paraplegia usually guides treatment, however, some controversies remain about the time and benefits for spinal cord decompression in non-traumatic paraplegic patients, especially after 48 hours of the onset of paraplegia. The objective of this study was to evaluate the benefits of spinal cord decompression in such patients. We describe three patients with paraplegia secondary to non-traumatic spinal cord compression without sensory deficits, and who were surgically treated after more than 48 hours of the onset of symptoms. All patients, even those with paraplegia during more than 48 hours, had benefits from spinal cord decompression like recovery of gait ability. The duration of paraplegia, which influences prognosis, is not a contra-indication for surgery. The preservation of sensitivity in this group of patients should be considered as a positive prognostic factor when surgery is taken into account.

Keywords: Decompression; Paraplegia; Spinal injuries/complications

INTRODUCTION

Paraplegia is a well-defined state of complete motor deficit in lower limbs, regardless of sensory involvement, with muscular strength grading zero. It may be secondary to neoplastic, vascular, degenerative, inflammatory or traumatic disease(1,2).

The cause of paraplegia guides the treatment. However, some controversies remain about the timing for spinal cord decompression in patients with muscular strength grading zero, especially when the sensory modality is damaged(1).

This report discusses an atypical evolution of three patients submitted to spinal cord decompression after more than 48 hours of onset of paraplegia.

All the patients had the muscular strength of their four limbs evaluated. The preservation of pain and tactile sensitivity were also assessed. All patients included in this report had complete paraplegia with

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partial preservation of tactile and pain sensitivity, below the neurological level.

**CASE REPORT**

**Case 1**

A 33-year-old man, complaining of dorsal thoracic pain for 2 months, was admitted to the emergency unit with paraplegia for 4 days and urinary retention with partially preserved tactile and painful sensitivity in lower limbs. On clinical examination, a skin lesion in his right hand was detected and suggested cutaneous melanoma. A magnetic resonance (MR) of the thoracic spinal segment was compatible with an extradural lesion located in the dorsal portion of the cord at T8 level (Figure 1). He underwent a laminectomy T6 to T9 on the fourth day after the total paraplegia had begun. He was treated with radiotherapy 21 days after the surgical procedure. During a 6-month follow-up the patient regained full sphincter control, lower limbs' strength (grade IV), and walked without assistance.

After a 1-month follow-up, the patient presented muscular strength grade III in the RLL and grade IV in the LLL, and could walk with support. However, two months after the surgery the patient presented a sudden paraplegia and lost sphincter control. However, her pain and tactile sensitivity in both legs were maintained. She underwent an emergency T10-11-12 laminectomy (Figure 2) after five days of the onset of paraplegia. Ligament and facet hypertrophy and intense compression of the medullary canal were intraoperative findings. Eight months after the second procedure she was able to walk with assistance, had sphincter control and bilateral muscular strength grading IV.

**Case 2**

A 37-year-old woman, was admitted to the emergency unit with progressive paraparesis, muscular strength grade I in the right lower limb (RLL) and grade II in the left lower limb (LLL) due to a right-lateral T10-T11 disc herniation as revealed by MR of the thoracic spine (Figure 2). A right transpedicular microdiscectomy in T11 with medial right T11 pedicle resection was performed concurrently to a pedicle screw fixation (Figure 2).

**Case 3**

A 54-year-old, man was admitted to our service. He had multiple comorbidities (diabetes, systemic hypertension, heart failure, previous pulmonary thromboembolism and coumarin use) paraplegia, urinary retention and erectile dysfunction lasting for 1 year but with preserved tactile and painful sensitivity in lower limbs. Thoracic spine MR was compatible with T1-T2 meningioma (Figure 3). The patient underwent total tumor resection, with a three-level laminectomy (Figure 3). After 9 months, he
presented bilateral muscular strength grading IV with mild spasticity, and was able to walk with support. In addition, he discontinued the use of urinary catheter and regained sexual activity.

**DISCUSSION**

In traumatic paraplegia, spinal cord decompression is not often recommended since neurological recovery is unusual and may lead to cerebrospinal fluid (CSF) leakage(1).

The American Spine Injury Association (ASIA)(2) classifies traumatic paraplegia into two groups: first, those with complete injuries (also known as ASIA A), without motor and sensory function, and below the neurological level; second, those with preserved sensory function despite the lack of any motor function (paraplegic) also known as ASIA B. Both groups have distinct neurological recovery prognosis as stated by Harrop et al. who evaluated the neurological outcome of 282 patients who suffered thoracic and lumbar spine trauma. These authors observed that only 7.7% of patients, initially classified as ASIA A, showed some degree of neurological improvement compared with 66.7% of neurological improvements seen in patients classified as ASIA B after 1-year follow-up. Such data suggest that sensitivity preservation, despite total muscular strength loss, is an important prognostic factor in patients with spinal trauma(3).

However, the neurological outcome of non-traumatic paraplegia secondary to cord compression is uncertain and not well established like in traumatic spinal cord injury (SCI). Regarding neoplastic disease some case series and literature reviews suggest that surgical decompression should benefit those patients with less than 24 or 48 hours of onset of paraplegia compared with 35% of patients with partial motor deficit who showed neurological improvement(7). This author’s study, in the era of non-instrumental spinal surgery, proposed that the preoperative neurological status is an important outcome factor, as described previously, nevertheless, neurological improvement can be obtained even in patients with total paraplegia(8). However, these authors did not mention those cases with complete motor deficit from those with preserved sensibility.

DeWald et al. reported clinical improvement in 5 patients with paraplegia from 11 submitted to surgical decompression for spinal metastatic disease. Although they reported a reasonable outcome, they concluded that surgical decompression should be carefully evaluated in paraplegic patients, once the morbidity it is not negligible(8).

In the modern era of spinal surgery, Brohi et al. reported a patient that was submitted to a thoracic epidermoid tumor resection after 12 years of paraplegia with full recovery. Two studies also report paraplegia recovery after treatment of spinal dural arteriovenous fistula (endovascular embolization followed by surgery)(10). These cases state the idea that paraplegia is not an irreversible condition in some specific situations.

Apart from neoplastic disease, surgical decompression of paraplegic patients associated with degenerative is under-reported given the painless behavior of this type of disease (case 2). Both paraplegic patients described here with neoplasm involvement of the spinal cord (metastatic melanoma and meningioma, cases 1 and 3) regained motor function although the surgery was performed later (4 days and 1 year after the clinical onset). A muscular strength grading IV was seen in the follow-up in both patients.

**CONCLUSION**

In some cases of non-traumatic spinal cord compression paraplegia is not an irreversible condition. The duration of paraplegia, which influences prognosis, is not an
absolute contra-indication for surgery. Moreover, tactile and pain sensitivity preservation is considered a positive factor for surgery. A complete evaluation of all the sensitivity modalities is mandatory in these groups of patients. Further studies should be conducted to clarify these issues.

REFERENCES


