Sp 28 - In a spinal tuberculosis patient with neurological deficit, how long can we wait for response with drug therapy before deciding for surgery?

Eduardo Laos, Aithala P Janardhana, Marcelo Valacco

Recommendation:
Based on available data, in patients with spinal tuberculosis and neurological deficits, there is low-quality evidence to establish an adequate waiting time to evaluate the response to drug therapy before deciding on surgery.
In patients with moderate or severe neurological deficits (MRC ≤ 3/5), we suggest starting chemotherapy and performing surgery as soon as possible.
In patients with mild neurological deficit (MRC ≥ 4/5), we can start chemotherapy and re-evaluate the possibility of surgery after 4 to 12 weeks.

Level of Evidence: Low

Delegate Vote:

Rationale: Antituberculous therapy (ATT) remains the standard treatment for Pott disease, and cure can be achieved in most patients with strict, standard ATT(1). The spinal cord may be affected by compression of bony elements, an expanding abscess, and/or by direct involvement of the cord and leptomeninges by granulation tissue. Neurological deficits are usually more symmetrical and of more gradual onset than those resulting from other pathologies(2). Paraplegia and quadriplegia are some of the serious complications seen in approximately 10% of cases with spinal involvement(3). In particular, for patients with progressive exacerbation or severe paraplegia, the use of anti-TB drugs alone before surgery is not an option(4).

Based on retrospective articles, surgical indications include increased neurological deficit during ATT treatment(5)(3)(6)(7)(8)(9)(10)(11) (4) (12) and, for some authors, the lack of improvement of the deficit during ATT. Although only some of them establish an adequate time for pharmacological therapy before surgery(4)(6)(9)(10), two authors establish their criterion at 4 weeks as a cut-off point(4)(9) and a paper in 12 weeks(10).

In addition, we can mention that there is a certain consensus regarding the intensity of the neurological deficit for the indication of initial surgery. However, this point is discussed in another section of this document. However, it is appropriate to describe that authors such as Nene and Bhojraj(12) among their absolute indications for surgery in adults are advanced neurological deficit (less than Grade 3 of 5, according to MRC), and neurological worsening during anti-tuberculosis chemotherapy. For their part, Bhandari et al.(6) defined a minor motor deficit as a muscle power > grade 4 (according to MRC classification), while a major motor deficit was defined as a muscle power ⩽ grade 4, in which initial surgery would be indicated. Chandra et al.(11) applied a management protocol based on the neurological deficit and the subsequent decision on the need for surgery depending on the clinical grade (good grade: Frankel C/D/E; poor grade: Frankel A/B). Patients with potential deterioration (vertebral body collapse, spinal cord compression, deformity, presence of paraspinal abscess with extension to the epidural space) and good clinical grade underwent a trial of medical therapy, whereas all patients with poor grade underwent surgery. Of 36 of 212 patients started on ATT alone, 38% (14)

of these required surgery due to lack of response to medical treatment and/or clinical/radiological deterioration, and 62% (22) improved with medical therapy alone.

Some studies recommend ATT for at least 4 weeks before patients with spinal tuberculosis receive surgical treatment, arguing that during this time the disease status can be stabilized and body temperature, erythrocyte sedimentation rate (ESR), C-reactive protein level, and other indices can be returned to acceptable ranges(4)(9). In the context of patients with neurological deficits, Jia et al.(4) found that ASIA scale scores were significantly increased 1 month after surgery in the <4 weeks group compared with the ≥4 weeks group (P = 0.001), and at 24 months improved to 4.4 ± 0.5 and 4.5 ± 0.4 in patients with anti-TB treatment times of ≥4 weeks and <4 weeks, respectively (P = 0.0895). These authors recommended that early surgical treatment after <4 weeks of standard ATT may relieve spinal cord compression and also benefit early recovery of neurological function in patients with thoracic spinal TB. Because of safety, surgery is performed when symptoms of TB poisoning subside, ESR <40 mmol/h, and hemoglobin >100 mmol/L. Liu and Nie(13), retrospectively reviewed 47 adult patients with spinal TB and neurological deficits, and concluded that the duration of neurological symptoms before surgery, and not the degree of neurological involvement, correlates with the neurological recovery of the patients; however, reducing preoperative chemotherapy does not result in significant improvement in outcomes; therefore, undergoing four weeks of preoperative chemotherapy is acceptable. Safe and effective neurological recovery is an important therapeutic goal for surgical intervention.

Garg et al.(10) described 12 weeks of ATT alone before surgery, of the 1,652 patients, 19% had neurological deficits. Surgery was required in 10.5% (173) of the patients, of which 46 underwent surgery after a period of ATT alone, 26 had neurological worsening and 20 did not improve with conservative treatment at 12-16 weeks. In another retrospective study by Njoku et al.,(2) the progress of 30 patients with ATT alone is described. They were closely monitored in the first twelve weeks of therapy. Six could walk unaided within this period, while another eleven could walk with crutches. Another thirteen had power between grades 1 and 2. After two weeks of therapy, grade one power was seen in 4 patients who were admitted with grade zero power. The first change from grade 1 power to grade 3 power was after four weeks of therapy. After another two weeks, this patient was able to walk with crutches. The first change from grade 1 power to grade 4 power was eight weeks in one patient. Most of the others who walked unaided did so after twelve weeks of therapy. Still, others took twelve weeks before they were able to walk with crutches. Some of these continued to make steady progress until they were able to walk unaided. Most of those who did not show any neurological improvement after six months of therapy did not show any further neurological improvement. There was no definitive recovery in another 10 patients.

References:

1. Malangu M, Faye M, Barry LF, Sy EHCN, Diop A, Ilunga RM, et al. Pott's disease surgery in Senegal: Management difficulties and results of 212 cases in a developing country. Interdiscip Neurosurg [Internet]. 1 de diciembre de 2023 [citado 11 de enero de 2025];34:101858. Disponible en: http://www.sciencedirect.com/science/article/pii/S221475192300141X

2. Njoku CH, Makusidi MA, Ezunu EO. Experiences in management of Pott's paraplegia and paraparesis in medical wards of Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria. Ann Afr Med. marzo de 2007;6(1):22-5.

3. Bakhsh A. Medical management of spinal tuberculosis: an experience from Pakistan. Spine. 15 de julio de 2010;35(16):E787-791.

4. Jia CG, Gao JG, Liu FS, Li Z, Dong ZL, Yao LM, et al. Efficacy, safety and prognosis of treating neurological deficits caused by spinal tuberculosis within 4 weeks' standard anti-tuberculosis treatment: A single medical center's experience. Exp Ther Med. enero de 2020;19(1):519-26.

5. Kumar K. Spinal tuberculosis, natural history of disease, classifications and principles of management with historical perspective. Eur J Orthop Surg Traumatol Orthop Traumatol. agosto de 2016;26(6):551-8.

6. Bhandari A, Garg RK, Malhotra HS, Verma R, Singh MK, Jain A, et al. Outcome assessment in conservatively managed patients with cervical spine tuberculosis. Spinal Cord. junio de 2014;52(6):489-93.

7. Elsawaf A. Outcome of surgical versus conservative management of cervical spine myelopathy secondary to cervical tuberculosis. Neurosurg Rev. octubre de 2013;36(4):621-8; discussion 628.

8. Jutte PC, van Loenhout-Rooyackers JH. Routine surgery in addition to chemotherapy for treating spinal tuberculosis. Cochrane Database Syst Rev. 25 de enero de 2006;(5):CD004532.

9. D'souza AR, Mohapatra B, Bansal ML, Das K. Role of Posterior Stabilization and Transpedicular Decompression in the Treatment of Thoracic and Thoracolumbar TB: A Retrospective Evaluation. Clin Spine Surg. diciembre de 2017;30(10):E1426-33.

10. Garg B, Mehta N, Mukherjee RN, Swamy AM, Siamwala BS, Malik G. Epidemiological Insights from 1,652 Patients with Spinal Tuberculosis Managed at a Single Center: A Retrospective Review of 5-Year Data. Asian Spine J. abril de 2022;16(2):162-72.

11. Chandra SP, Singh A, Goyal N, Laythalling RK, Singh M, Kale SS, et al. Analysis of changing paradigms of management in 179 patients with spinal tuberculosis over a 12-year period and proposal of a new management algorithm. World Neurosurg. 2013;80(1-2):190-203.

12. Nene A, Bhojraj S. Results of nonsurgical treatment of thoracic spinal tuberculosis in adults. Spine J Off J North Am Spine Soc. 2005;5(1):79-84.

13. Liu P, Nie H. The Effect of Time-to-Surgery on Outcome in Patients with Neurological Deficits Caused by Spinal Tuberculosis. Turk Neurosurg. 2018;28(2):275-81.