

Clinical Examination and the Diagnosis of Cauda Equina Syndrome. More Examination, Not Less

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Letter to the Editor

In a recent article in this journal, Zusman et al¹ reported the use of clinical assessment in the diagnosis of suspected cauda equina syndrome (sCES). Four measures were used: rectal (anal) tone (AT), perianal sensation (PAS), the bulbocavernosus reflex (BCR) and the post-void bladder volume (PVR). The results were compared to a post-MRI diagnosis of CES in 10 cases. The sensitivity and specificity were BCR, 100% and 100%; AT, 80% and 86%; PVR, 80% and 59%; and PAS, 60% and 68%. The combination of normal AT, PAS and BCR resulted in no false negatives. This is an important paper because it counters a narrative that because the sensitivity and specificity of a single clinical examination finding is low, clinical examination has only a limited place in the assessment of sCES cases and clinical examination can, in some cases, be abandoned.

The following are the opinions of the author. It is long established that there is no single clinical symptom or sign that predicts MRI+; combinations of positive symptoms and signs are more likely to be predictive of MRI+ particularly if CES is severe and often irreversible.²⁻⁹ This has led some authors to suggest that some aspects of clinical examination, particularly the assessment of AT, can be abandoned.^{6,10} Lopez et al¹⁰ reported a retrospective review of 1005 patients with sCES from a single UK centre over a 3-year period. A positive MRI (MRI+) was found in 117 (11.6%). PAS was reduced in 47% of cases where PAS was assessed (41% unilateral and 59% bilateral). Reduced PAS was found in 47% of MRI– and 52% of MRI+ cases. AT was abnormal in 31%, 31% of MRI– and 35% of MRI+ cases. There was no significant association between MRI+ and abnormal AT on uni- or multi-variant analysis. The authors suggested that assessment of AT may not be needed in the clinical diagnosis of CES. Assessment of PAS was recommended despite the fact there was no overall association of PAS with MRI+.

One of the problems with the clinical assessment of CES is that typically, we assess just 2 symptoms and 2 signs. The 2 symptoms are a subjective change in PAS or bladder function.

The 2 signs are objective reduction of PAS or AT. Sensory examination is the least objective of the so-called objective signs (because it requires interpretation of sensation by the patient). The clinical assessment of AT is inaccurate.¹¹ In a model simulating AT, only 64% of AT assessments were correct.¹² PAS and AT are not the most sensitive signs of sacral nerve root injury. The assessment of anal squeeze (AS) may be more accurate than AT.¹² The bulbocavernosus reflex (BCR) is rarely tested in CES, but an absent BCR has a high correlation with MRI+.¹ Even though a single sign has a poor correlation with MRI+, combinations of signs are more accurate.¹ If negative signs are combined with bladder ultrasound (BUS), normal PAS and AT, and a PVR ≤ 200mL, it excludes MRI+ in almost all cases¹³ (very uncommonly that there are symptom-only CES cases). Although it is the case that any single sign does not determine which cases will be MRI+, this does not mean that we should abandon clinical examination; indeed, the opposite is the case. All sCES cases should have assessment of PAS, AT, AS and PVR. BCR is not currently widely used, and it is a difficult assessment in women in the lateral position. Widespread assessment of the BCR may be controversial, and this assessment could be reserved for cases with a strong clinical suspicion of CES with all other assessments being negative. Adding AS and PVR to the traditional PAS and AT assessments has no cost and will add little time to the assessment.

It is critical to avoid false negatives, that is, deciding that a patient does not have CES on clinical grounds and not performing MRI in a patient who has CES (clinically and radiologically). It is probable that few MRI+ cases will be missed if all of the tests (PAS, AT, AS and PVR [and if needed,

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BCR]) are normal. Some false positives (clinically positive but MRI-) will still occur, particularly where some but not all of the variables are abnormal. However, this will probably be substantially less than with current clinical assessment. In any event, some false positives are the price for not missing a diagnosis of CES. The utility of using all of these clinical assessments will need to be tested prospectively. This amplified clinical examination should increase both the sensitivity and specificity of the clinical assessment of CES.

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References

- Zusman NL, Radoslovich SS, Smith SBS, Tanski M, Gundle KR, Yoo JU. Physical examination is predictive of cauda equina syndrome: MRI to rule out diagnosis is unnecessary. *Global Spine Journal*. 2020;16:1-6.
- Bell DA, Collie D, Statham PF. Cauda equina syndrome: what is the correlation between clinical assessment and MRI scanning? *Br J Neurosurg*. 2007;21(2):20-203.
- Balasubramanian K, Kalsi P, Greenough CG, Kusoor Seetharam MP. Reliability of clinical assessment in diagnosing cauda equina syndrome. *Br J Neurosurg*. 2010;24(4):383-386.
- Ahad A, Elsayed M, Tohid H. The accuracy of clinical symptoms in detecting cauda equina syndrome in patients undergoing acute MRI of the spine. *NeuroRadiol J*. 2015;28(4):438-442.
- Dionne N, Adefolarin A, Kunzelman D, et al. What is the diagnostic accuracy of red flags related to cauda equina syndrome (CES), when compared to magnetic resonance imaging (MRI)? A systematic review. *Musculoskeletal Science and Practice*. 2019;42:125-133.
- Hoeritzauer I, Carson A, Statham P, et al. Scan-negative cauda equina syndrome. *Neurology*. 2021;96:e433-e447.
- Hussain MM, Razak AA, Hassan SS, Choudhari KA, Spink GM. Time to implement a national referral pathway for suspected cauda equina syndrome: review and outcome of 250 referrals. *Br J Neurosurg*. 2018;32(3):264-268.
- Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about low back pain? *JAMA*. 1992; 268(6):750-755.
- Domen PM, Hofman PA, van Santbrink H, Weber WE. Predictive value of clinical characteristics in patients with suspected cauda equina syndrome. *Eur J Neurol*. 2009;16(3):416-419.
- Curtis Lopez C, Berg AJ, Clayton B, et al. Evaluation of the role of anal tone and perianal sensation examination in the assessment of suspected cauda equina syndrome. *Br J Neurosurg*. 2021;9:1-5.
- Eckhardt VF, Kanzler G. How reliable is digital examination for the evaluation of anal-sphincter tone. *Int J Colorectal Dis*. 1993; 8:95-97.
- Sherlock KE, Turner W, Elsayed S, et al. The evaluation of digital rectal examination for assessment of anal tone in suspected cauda equina syndrome. *Spine*. 2015;40(15):1213-1218.
- Katzouraki G, Zubairi AJ, Hershkovich O, Grevitt MP. A prospective study of the role of bladder scanning and post-void residual volume measurement in improving diagnostic accuracy of cauda equina syndrome. *The Bone & Joint Journal* 102-B(6). 2020;102-B:677-682.