

Neuro-cranio-vertebral syndrome related to coccygeal dislocation: a preliminary study.



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INTRODUCTION

Neuro-cranio-vertebral syndrome (NCVS) includes a set of idiopathic diseases: Arnold-Chiari syndrome type 0,1 and 1.5, idiopathic scoliosis, and idiopathic syringomyelia. It is caused by the pathological traction transmitted by the filum terminale on the neuraxis. Considering that **the filum terminale is inserted at sacrococcygeal level**, it is logical to think that an alteration of this segment's anatomy, such as **an anterior coccyx dislocation**, can increase the tension exerted by the filum terminale on the neuraxis, which in turn triggers NCVS.

METHODS

- We collected data from **372 patients with NCVS and 15 patients with coccygeal dislocation (CD) and NCVS** from our database.
- Comparison of the most common **symptoms (Fig.1)**, **signs (Fig.2)** in both samples.
- Thoracolumbar scoliosis was the most common spinal deviation in the CD group (**Fig.4**).

RESULTS

Symptoms, signs, and imaging features were present in similar proportions, 65% in both samples. There was a similar prevalence of cerebellar tonsillar descent and scoliosis in both groups, whereas the incidence of syringomyelia differed. A sacrococcygeal angle between 89-110° prevails in cases of syringomyelia while an intercoccygeal angle between 90-140° prevails in cases with cerebellar tonsillar descent (**Fig.3**).

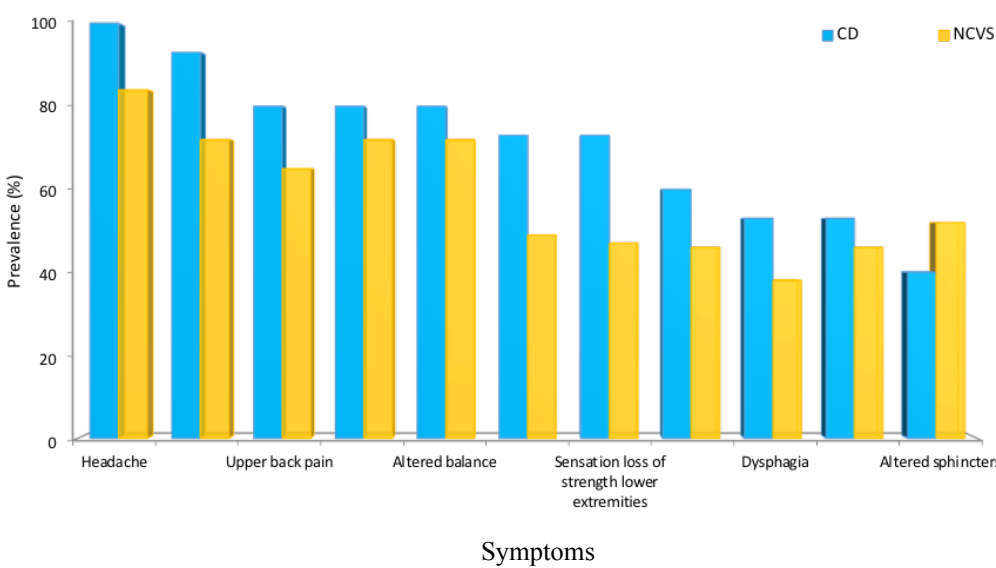


Figure 1. Comparison of the most common symptoms in both samples, where CD is the sample of 15 cases with coccygeal dislocation and NCVS is the sample of 372 cases with Neuro-cranio-vertebral syndrome.

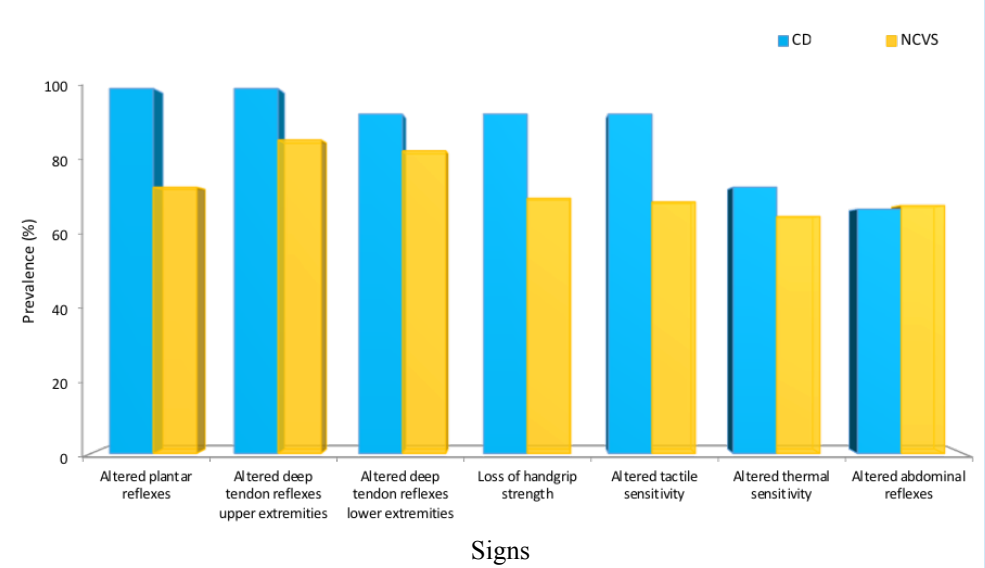


Figure 2. Comparison of the most common signs in both samples. Where CD is the sample of 15 cases with coccygeal dislocation and NCVS is the sample of 372 cases with Neuro-cranio-vertebral syndrome.

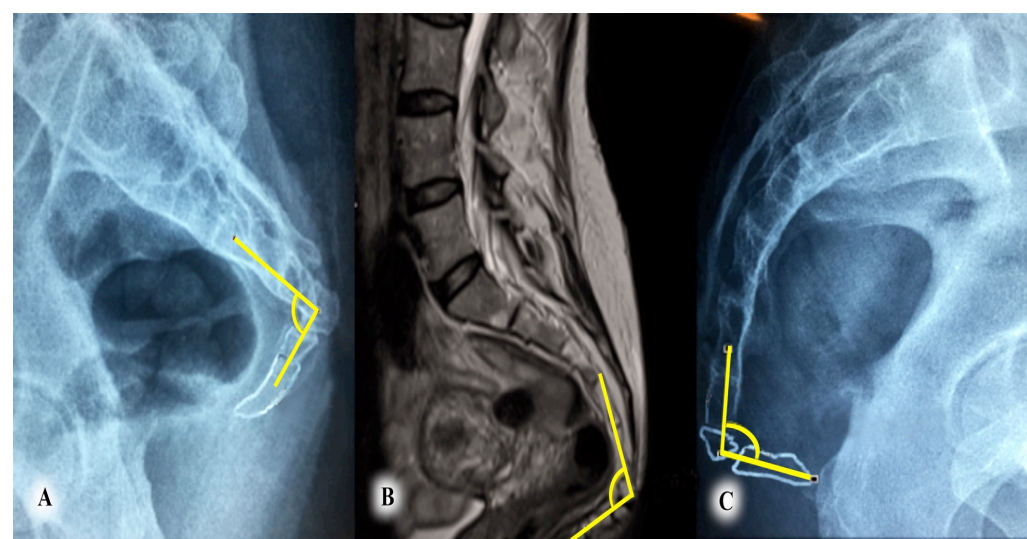


Figure 3. Representation of the intercoccygeal angle in three different cases. (a) Illustrates case 14, with an angle of 92.3°. (b) Represents case 10, with an angle of 104.2°. (c) Depicts case 11, with an angle of 103.3°.

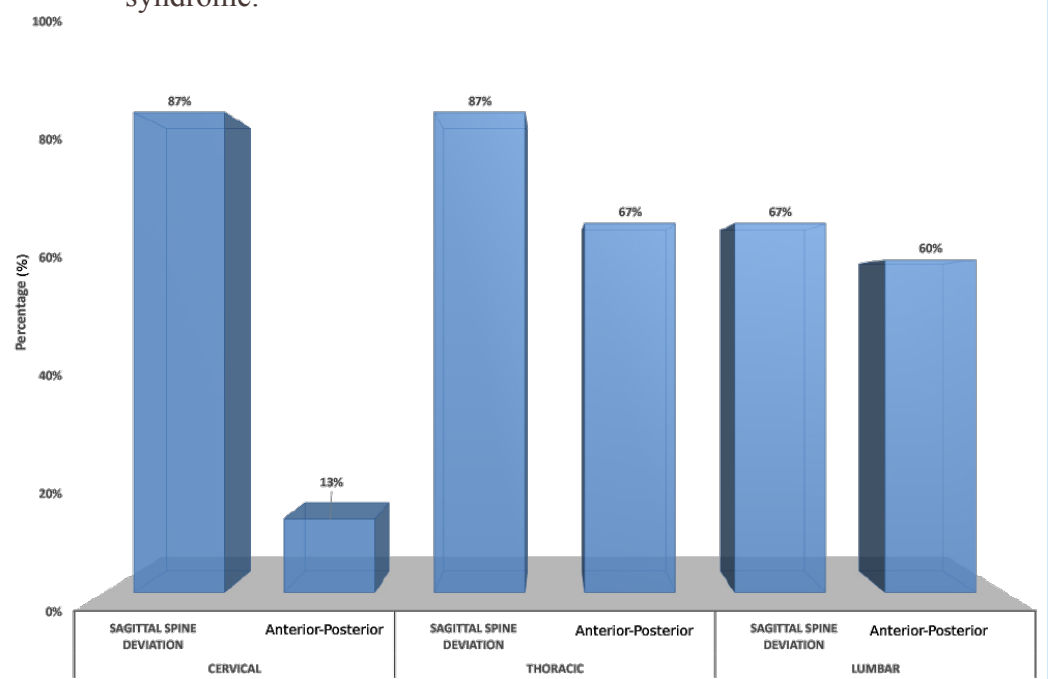


Figure 4. Spine deviation in 15 cases with CD

CONCLUSION

The high clinical and radiological prevalence of coccygeal dislocation in patients with Neuro-cranio-vertebral syndrome suggests an association between them. The mechanism involved in coccygeal dislocation can directly influence the development of Neuro-cranio-vertebral syndrome (**Fig.5**). A simple fall on the buttocks may hence result in the development of a neurological condition over time.

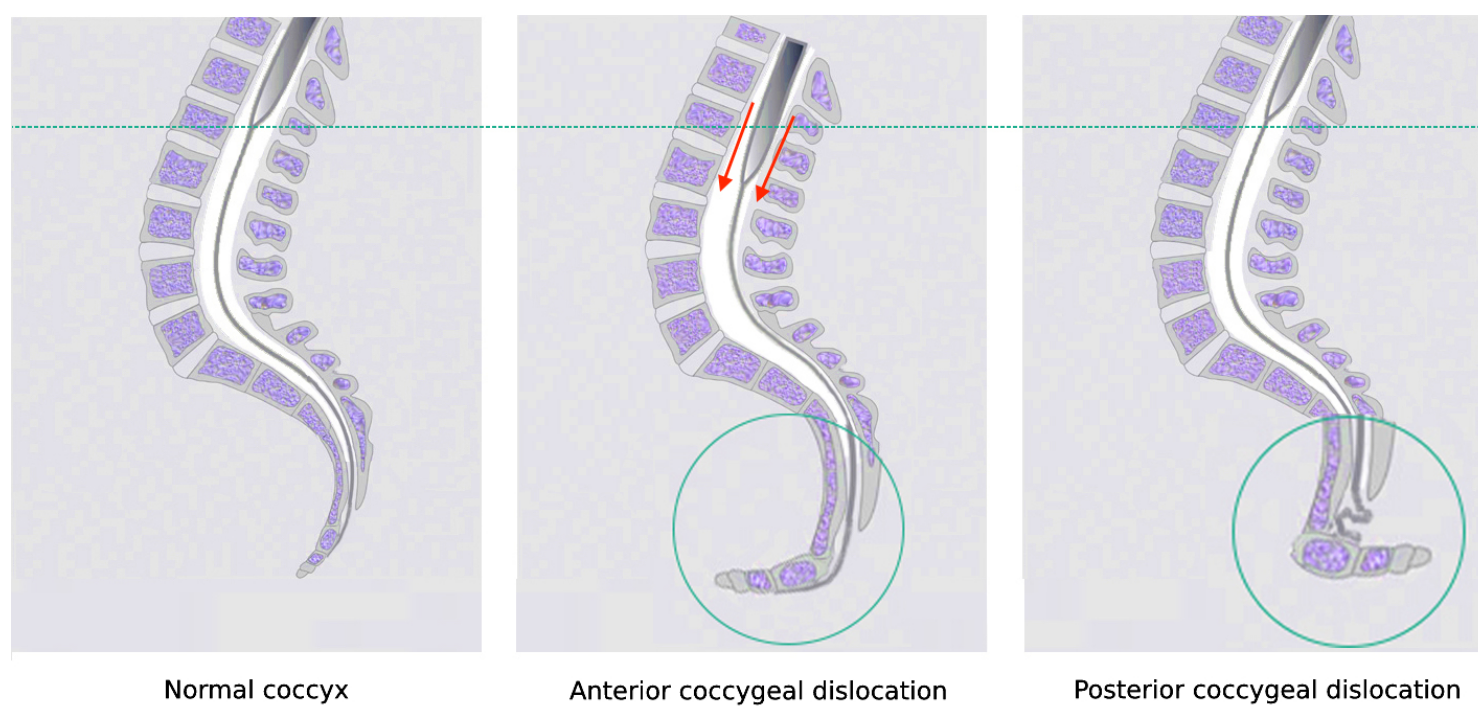


Figure 5. Model explaining the effect of the coccyx on the *filum terminale* and dural sac. From left to right: normal *filum terminale* tension in anterior coccyx dislocation, normal *filum terminale* tension, and posterior coccyx dislocation releasing the tension.

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