Diastematomyelia - Imaging Findings, Case Report

DANA ALBULESCU1, CARMEN ALBU2, C. CONSTANTIN3, ZOIA STOICA3, IULIANA NICOLESCU1

1Department of Anatomy, University of Medicine and Pharmacy of Craiova
2Department of Neurology, University of Medicine and Pharmacy of Craiova
3Department of Radiology, University of Medicine and Pharmacy of Craiova

ABSTRACT: Diastematomyelia consists in dividing into two hemi spinal cord cords symmetric and asymmetric in the presence of a bone spur. Malformation is more common in women, and this paper presents the case of a patient with this rare spinal dysmorphism, in terms of imaging, MRI is the only method of exploration that can establish the diagnosis and also can highlight and malformations associated.

KEYWORDS: diastematomyelia, magnetic resonance imaging

Introduction

Diastematomyelia or split cord malformation consists in dividing into two symmetrical or asymmetrical hemicords; each codon contains a central canal, anterior horn and posterior horn. Also, each coating has its own layer of pia (1).

The condition is more common in women, and lumbar region is shared location. There are two types present a classification of the disease (2,3). Type I Pang include the following: separate dural sac and arachnoidian space surrounding each bead, the presence of a bone spur or fibrous symptoms present. Type II Pang refers to asymptomatic cases in which there is no evidence of bone spur, with or without adherent fibrous bands tether cord, and usually symptoms are rare (2,3).

These issues may also have other spinal malformations (myelocele, myelomeningocele), vertebral anomalies.

Case report

We present the case of a patient of 45 years in urban areas, which presents the neuro consult for intense lumbar pain with radiation to the lower limbs, more pronounced in the left into the front leg and thigh, numbness in his left thigh and disorders walk [difficulty walking]. From the patient's statements show that the pain occurred a long time ago, without being able to specify exactly their age and that improved after administration of NSAIDs in monthly cycles.

Also, abnormal gait gradually widened and climbing stairs became impossible, especially after physical exertion or prolonged standing.

Neurological examination reveals: walking almost impossible; segmental muscle strength diminished, especially in the left lower limb, patellar reflex abolished the left side, right side diminished, Achilles reflexes present bilateral, tactile hypoesthesia on the face of internal and external anterior thigh and his left leg left, left lower limb amiotrophy [more pronounced in the left thigh].

The patient continued NSAID treatment and is recommended magnetic resonance examination lumbar and sacral level.

Radiographic examination reveals lumbar vertebral block.

Magnetic resonance examination was performed with Hitachi 1.5 T. We used sequences in sagittal, coronal and axial T2-weighted, T2 STIR and T1-weighted.

Sagittal images show the presence of fibrous bands at L3 (Fig.1).

Axial sections confirmed the presence of two cords asymmetric at L3, L5 level with their assembly-S1, the presence of spina bifida occulta (Fig. 2). In the coronal plane are seen in butterfly vertebra L3 level (Fig.3).

All this confirms the diagnosis of type I diastematomyelia associated with the butterfly vertebrae and spina bifida.
Fig. 1. Sagittal T2 and T2-weighted STIR images shows the presence of a spur at L3 level; L3 vertebra has altered morphology; reducing the size of the terminal fillum.

Fig. 2. Axial T2-weighted images show the spur which divides the spinal canal into two halves; clearly highlights the two hemicords (a,b); below the spur of the two hemicords come together (c); spina bifida is also show (c)

Fig. 3. Coronal T2-weighted images show the butterfly vertebra L3 level
Discussions

The appearance of diastematomyelia should be linked to the canalization and differentiation retrogression that form the lumbar cord, distal medullary cone and filum terminale.

Notochord cells migrate from node Hense; to encounter an obstacle such ectoderm and endoderm adherence between cells Notochord bypass the obstacle or split and continued on both sides simultaneously. Following notochord develops a lateral notch or central cleft. Diastematoyielia accompanying vertebral malformations are also a consequence of abnormalities of notochord because it influences the development of vertebral body (3).

Bone spur derived from cartilage ossification centers present (4) The aspect of spur depends on the number of ossification centers and the age of the patient (4, 5) and thus can identify a cartilaginous structure, fibrous or bone, according to the aspect of the signal in T1 and T2 weighted; also by examining CT scan can accurately visualize the nature of the spur.

It highlights two hemicords usually separated by approximately equal spur, and other injuries that usually accompany diastematomyelia. Most frequently appear spina bifida and vertebral anomalies: vertebral block, hemivertebra, butterfly vertebrae, intervertebral disc height reduction (2). Other abnormalities that occur in different proportions are myelocele, myelomeningocele, lipoma, dermal sinus, desmoid tumors, hydromyelia (2,6).

Differential diagnosis is made with diplomyelia consisting in presence of two complete spinal cords, each cord having two anterior horns and two posterior horns (2).

Features of this case is the presence of spinal cord spur fibrous dividing into two asymmetrical hemicords at L1; are viewed in axial sections at L2 spina bifida; images in the coronal plane highlights the butterfly vertebra at L1.

All these imaging features within the case in Pang type I or type I diastematomyelia by the presence of two fused hemicords below the fibrous septum, as shown in section in the axial plane; also reducing the size of filum terminale observed in sagittal sections, setting to lower spinal cord. Pair with spina bifida and butterfly vertebra in guiding diagnosis for Type I diastematomyelia

Pang et al suggest in 1992 that the term diastematomyelia be replaced with split cord malformation the but in general medical practice and literature uses the term diastematomyelia and the two types described by Pang.

Conclusions

It notes the importance of magnetic resonance examination in the diagnosis of diastematomyelia, the possibility of precise identification of the existence of the spur, the presence of two hemicords and identification of associated injuries. Also magnetic resonance examination is indispensable to successful surgery.

Acknowledgment

Contribution note - all authors participated in the research and drafting equal work.

References

4. Barkovich JA. Pediatric Neuroimaging, 4th ed, Lippincott Williams & Wilkins, 2005, 744-752