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Challenges regarding rehabilitation treatment in a case of postpartum spastic paraparesis, secondary to a T9 vertebral fracture on the pathologicallybone operated - case report

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Abstract

Introduction. Pregnancy is a well-known risk factor for asymptomatic hemangiomas discovered incidentally, becoming aggressive or symptomatic, most often in the third trimester of pregnancy, related to hemodynamic and endocrine changes that occur during pregnancy. Many patients experience incomplete spontaneous remission after birth. **Material and method**. We report the case of a 24-year-old woman, who presented for incomplete paraplegia, pain in the spine, instability of walking of the left lower limb, bilateral plantar paresthesia, possible walking with metal support. **Results and discussions**. The MRI performed identifies T9 vertebral fracture-compression on pathological bone, T10-T12 vertebral hemangiomas. **Conclusions**. In order to obtain favorable results, the patient benefited from the support and treatment of a multidisciplinary team: neurosurgeons, imagers, physical and rehabilitation medicine doctors and physiotherapists, and represented a real challenge regarding the complexity of the factors involved.

Keywords: *hemangioma, rehabilitation, multidisciplinary team,*

Introduction

The first description of vertebral body hemangioma was made by R. Virchow in 1867 (1). Probably the first description of the associated neurological manifestations, were presented by Gerhardt in Germany in 1895. However, only in 1926 Perman, then Bailey and Bucy - in 1929 described in detail the radiological characteristics, accepted even today, of vertebral hemangioma. Pregnancy is a well-known risk factor for asymptomatic hemangiomas discovered incidentally, becoming aggressive or symptomatic, most often in the third trimester of pregnancy, related to hemodynamic and endocrine changes that occur during pregnancy (2,3). Many patients experience incomplete spontaneous remission after birth (4). Hemangioma is the most common benign vertebral tumor, developing in the vascular endothelium, with slow growth (5,6). It is more common in postpubertal women, maximum morbidity (onset) is found in the 3rd decade of life (7,8,9). It is found extremely rarely in children, but with age it increases in size (10). It has been found that 10% of complicated vertebral fractures of hemangioma occur in pregnant women, the maximum activation taking place in the third trimester of pregnancy (11).

In 76% of cases, hemangioma affects the thoracic segment, preferably the T6 vertebral body, followed by the lumbar segment with preferential location in the L3 vertebral body, the cervical and sacral segments are affected very rarely (less than 1%) (12). It usually affects a vertebral body, but in 10-15% of cases it can be multiple - hemangiomatosis (13). The clinical picture is variable, from asymptomatic to pain and spinal cord compression (15,16).

Radiological images have a pathognomonic aspect: vertebral striations, which give the vertebral body an alveolar appearance, respecting the integrity of the cortical bone and the intervertebral disc (17,18). The treatment consists of classic or minimally invasive surgery with percutaneous vertebroplasty, alcoholization, embolization or radiotherapy treatment (19, 20).

Material and method

We present a case of a woman 24-year-old, presented to the Techirghiol Balneal and Rehabilitation Sanatorium for motor deficit with incomplete paraplegia, pain in the spine, instability of the left lower limb, bilateral plantar paresthesias, possible with metal frame support. From the personal physiological and pathological antecedents, we remember an ovarian cyst operated, a birth by cesarean section-twin pregnancy (two mounths ago), vertebral compression fracture on pathological bone T9 operated, for which T9 cement vertebroplasty was performed and bilateral metal synthesis with transpedicular screws at T8,

T10 and interconnecting rods, laminectomy T9. During surgery, the left T9 root is resected as needed. From the patient's medical history, we remember multiple pregnancies with 3 embryos initially, later an embryo stopped evolving in week 5-6 of pregnancy. At week 10, the patient was diagnosed with low pregnancy, at risk of miscarriage, and was recommended bed rest. Week 20 coincides with the onset of back pain, with the palpation of a painful formation on the back. Following a specialist consultation, bed physiotherapy is recommended. The patient's symptoms are persistent, with paresthesias in the lower limb, intensified back pain in orthostatism and gait, improved in dorsal decubitus.

It is recommended by the specialist doctor after the clinical examination, to perform a spine MRI, but the patient refusing. The patient gave birth on time, by cesarean section, without medical problems. Postpartum, the symptoms were rapidly progressive, with the appearance of sensitivity disorders, with impaired tactile superficial sensitivity, painful and thermal with hypoesthesia in the bilateral lower limbs, but also with impairment of deep myo-arthro-kinetic and vibratory sensitivity, with poor perception of imprinted movements in the segments of the pelvic limbs. In addition to the appearance of sensitivity disorders, pain intensifies in the lumbar spine with irradiation in the pelvic limbs. Computer tomograph is performed in a private clinic and no imaging changes are identified, it is recommended to rest in bed, the pain being attributed to the weight gained during pregnancy. Subsequently, due to the altered general condition, the persistence of neuroradicular syndrome and sensitivity disorders, the patient addresses the Emergency Department of the County Hospital "Sf. Apostol" Constanța, and following clinical and magnetic resonance imaging (MRI) examinations the following diagnoses are made:

- T9 vertebral fracture-compression on pathological bone (vertebral hemangioma)
- T10-T12 vertebral Hemangioma
- Incomplete Frankel C paraplegia with T8 level
- Lower limb pressure
- Micturition disorder
- Anemia

Emergency hospitalization is recommended for surgery. Due to the complexity of the surgery, the transfer is decided in the Neurosurgery Department II of the Emergency Clinical Hospital "Bagdasar-Arsenie" Bucharest.

Clinical examination at presentation:

- Attitude: keep lying down -Walking and orthostatic: impossible
- Mobility: Frankel C with T8 level
- Cutaneous reflexes: indifferent bilateral planting
- ROT: present, diminished lower limbs
- Sensitivity: sensitivity deficit with neurological level T8
- Sphincters: normal, without disorders
- Cranial nerves: I-XII normal clinical relations
- Psychic / Speech: oriented temporally-spatially and to one's own person

The MRI performed in the sagittal plane (Fig.1) shows: compression of the T9 vertebral body with cuneiform appearance, recoil of a bone segment at the posterior wall, intracanal posteroinferior with compressive effect on the dural sac, focal lesion of 6/7 mm with osteolytic character at the external 1/3 level and upper vertebral body T10. MRI examination, axial section (Fig.2): bone structure is inhomogeneous in the T9 vertebra (body, pedicles, transverse and spinous processes, upper and lower joint processes) by the presence of predominantly osteolytic lesions, associating the visualization of bone trabeculae, the appearance being suggestive for vertebral hemangioma. The surgery is decided, performed vertebroplasty with cement T9 and bilateral metal synthesis with transpedicular screws at T8 and T10 level and interconnecting rods, T9 laminectomy. The left T9 root is dried out of necessity, the dura mater remains intact.

Discussions

Favorable postoperative evolution, without complications. She was discharged on time, and was referred to the medical rehabilitation service. Ten days after surgery the patient was transferred from the Neurosurgery Department, to the Medical Rehabilitation Service from Techirghiol Sanatorium, for incomplete paraplegia with T8 level, where she underwent a complex physical kinetic recovery treatment, in order to posture and re-educate the gait.

The patient was evaluated clinically, functionally (using the Frankel, Barthel scales, IADL / ADL index) and biologically, in dynamics to monitor the effectiveness of the neuromotor recovery program.

Clinical examination performed at admission shows:

- Temporally-spatially oriented patient, auto and allo psychic, cooperative, MMSE 30/30 test, without signs of meningeal irritation;
- Presents supple postoperative wound, healing, without signs of inflammation, at T8-T12 level (Fig.3) ;
- Increased abdomen of postpartum volume, flaccid (Fig.3) ;
- Static vertebral syndrome: the alignment and posture of the cervical spine lumbar back are analyzed both in the frontal plane and in the sagittal plane and the accentuation of the dorsal kyphosis is observed (Fig.3) with lumbar rectitude in the sagittal plane;
- Dynamic vertebral syndrome: limited mobility in all axes of movement;

- Musculoligamentar syndrome : bilateral lumbar paravertebral muscle contracture;
- Neuroradicular syndrome: back pain in prolonged sitting position and orthostatism, lumbar pain with irradiation in the pelvic limbs;
- Sketched proximal motor control, sketched intermediate and distal missing right inferior limb, proximal motor control, intermediate, low distal, MRC score 2/5 lower limbs, low muscle tone lower limbs with hypotonia, right Achilles tendon hyperreflectivity, live bilateral patellar ROT, hypo-aesthesia bilateral pelvic limbs, hypo-aesthesia of the lower abdomen, no sphincter disorders, positive paresis tests for the right lower limb;
- Severe global motor deficit severe lower right limb, moderate motor deficit lower left limb;
- Possible transfers assisted from the supine position to the elongated seat, from the elongated sitting position to the shortened seat;
- Possible verticalization assisted by maintaining orthostatism with lateral support;
- Possible walking with human assistance or in support of the walking frame.

The patient is evaluated functionally using specific functional scales: ADL (5p), IADL (could not be calculated because the patient did not perform current activities during hospitalization), Barthel (50p), FIM (motor score-15 / 28: average functional impotence, cognitive score- 14/14, total FIM score 29/42-average functional impotence).

Standard phosphocalcic metabolism tests were performed to support the differential diagnosis. The patient has a severe vitamin D deficiency, with very low values of 25 hydroxy vitamin D (6.8 ng / ml), the laboratory where the blood samples were performed defining the vitamin D deficiency with values < 12 ng / ml, insufficient level : 12-20 ng / ml, acceptable level 20-30 ng / ml, optimal level 30-100 ng / ml, toxic level> 100 ng / ml. PTH is within normal limits, although we would have expected secondary hyperparathyroidism; this is due to the suppression of PTH by hypercalcemia of 11.7 mg% (8.7-10.4 / mg / dl). In this regard, it is recommended to repeat the calcium levels and avoid calcium administration; Instead, vitamin D (cholecalciferol 2000 IU / day) is recommended. Bone densitometry is performed with normal DXA values for the standard regions examined, which excludes a diffuse bone genetic pathology. Considering the symptomatology and the clinical picture of the patient, the following therapeutic scheme is decided:

- Magnetotherapy back plate;
- Ultrasounds bilateral Achilles tendon, 0.4 W / cm² / 4′ + 4′ ;
- Galvanic bath lower limb 4 cells, individual polarity for each tank, 20′ with threshold intensity ;
- Toning massage lower limbs 10′;
- Individual physiotherapy with the objectives: spine relaxation, toning lower limb muscles, coordination re-education, gait re-education.

The patient has a favorable evolution, with a significant improvement of the symptoms after the first week of treatment with the resumption of walking without support.

It is re-examined at discharge through the BARTHEL and ADL scales, obtaining 80 points, respectively 8 points, corresponding to the quasi-dependence stage.

Conclusions

Through the established early rehabilitation program, the therapeutic efficiency was significant with the improvement of clinical symptoms, as well as a marked increase in functional parameters, ensuring the patient an increased degree of autonomy and reintegration into social and family life. Pregnancy is a special situation in which vertebral hemangiomas can become clinically manifest, especially in the last 3 months of pregnancy. With the help of early physical kinetic treatment, we can significantly contribute to the rehabilitation of the remaining clinical-functional deficit, hoping for complete recovery (21).

Multidisciplinary management of this case shows the importance of our comprehensive knowledge in clinical practice from rehabilitation doctors point of view (22).

Declaration of conflict of interests. There is no conflict of interest for any of the authors regarding this paper.

Informed consent. An informed consent was obtained from the patient included in the study

Fig.1. Sagittal CDL MRI: T9 vertebral body compression with cuneiform appearance, recoil of a bone segment at the level of the post wall, posteroinferior intracanal with compressive effect on the dural sac, focal lesion of 6/7 mm with osteolytic character at the level of 1/3 ext. and upper vertebral body T10.

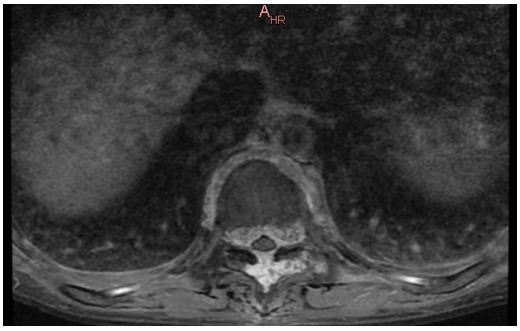

Fig.2. CD MRI Axial section: bone structure is inhomogeneous in the T9 vertebra (body, pedicles, transverse and spinous processes, upper and lower joint processes) by the presence of predominantly osteolytic lesions, associating the visualization of bone trabecula suggestive of hemangioma vertebral.

Fig.3. Slender postoperative scars healing. Posture adopted by the patient, accentuation of the dorsal kyphosis

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