Case Report

Unusual giant intraspinal teratoma in an infant

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Received March 11, 2011; accepted January 4, 2012

Abstract

There are few cases of giant pediatric intraspinal teratoma. We report a case of a 4-month-old female baby with giant intraspinal teratoma. Magnetic resonance imaging (MRI) of the spine revealed a large intradural tumor from the C7 to S2 level, with solid, cystic, and fatty components. Partial surgical removal of the tumor showed pathology of a mature cystic teratoma. The imaging diagnosis of intraspinal teratoma included the location, solid and cystic component, and fatty content. The MR techniques adopted included gradient echo sequences as used to detect teeth or calcification. The difficulties in surgical resection of this case are also presented.

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Keywords: magnetic resonance imaging; spine; surgery; teratoma

1. Introduction

Teratoma is a tumor with tissue or organ components, and resembles normal derivatives of all three germ layers.1 In newborns, spinal teratoma is more commonly found in the sacrococcygeal area (1 in every 35,000 live births) and more in female babies. Sacrococcygeal teratomas commonly present with posterior pelvic masses. Intraspinal growth is very unusual and may be similar to other spinal tumors. We present a report on a case of pediatric intraspinal giant teratoma and highlight the differential diagnoses and management.

2. Case report

Progressive lower limb weakness and intermittent oliguria of 1 month’s duration were found in a 4-month-old female baby. She had no systemic disease or abnormal delivery history. Spinal sonography revealed an intraspinal mass lesion at the lumbar spine. No abnormal hair, sinus tract, or dimples in her back were observed on physical examination. Neurological examination showed paraplegia with the muscle power of Grade 0 in the left lower limb and Grade 1 in the right lower limb. Decreasing deep tendon reflex and loss of anal tone were also found.

Magnetic resonance imaging (MRI) of the whole spine showed a large intradural mass lesion with both solid and cystic parts from the C7 to S2 level. It resulted in spinal cord compression (Figs. 1 and 2). It also extended to the intervertebral foramina (Fig. 2). The fatty components and heterogeneous cystic parts helped us make the diagnosis of intraspinal teratoma.

Partial tumor removal was done with unroofing of cyst and cystic fluid drainage in the T9–L4 level. The tumor was composed of mature neural tissue, skeletal muscle, adipose tissue, enteric tissue, squamous, and respiratory epithelium. Neither immature components nor other germ cell tumor components were identified. The pathological diagnosis was...
mature cystic teratoma. The baby’s muscle power of the lower limbs improved to Grade 2–3 after surgery.

A cystometrogram showed a normoreflexic bladder. A follow-up MRI 6 months later showed a residual tumor without a significant mass effect.

3. Discussion

The real incidence of intraspinal teratoma is still unknown, unlike that of sacrococcygeal teratoma. Only a few case reports have been found in previous studies. Children have higher incidence of intraspinal teratoma than adults, and most pediatric cases are aged <9 years. Most cases are mature teratoma and rarely show malignant change. Such a large tumor size as in our case involving the cervical to sacral region is very rare. Only one reported case showed similar morphology. Combined spinal dysraphic anomaly is often found in the case of sacrococcygeal teratoma. Spina bifida, dermal sinus, split cord, meningomyelocele,

Fig. 1. Sagittal magnetic resonance (MR) images of the T-L spine of intraspinal teratoma. (A) Precontrast T1-weighted imaging (T1WI) showed a giant isointense intradural mass lesion. The mass lesion had both solid and cystic components. (B) Contrast-enhanced T1WI with fat saturation revealed heterogeneously strong enhancement of the solid part of the tumor (arrows). The majority of the solid part of the tumor showed a strong enhancement pattern. Note the fatty component of the teratoma (arrows), which was hyperintense on precontrast T1WI and was suppressed by fat saturation on contrast-enhanced T1WI. The fatty component also showed no enhancement after gadolinium injection (arrows).

Fig. 2. (A,B) Sagittal magnetic resonance (MR) images of the whole spine with T2-weighted imaging (T2WI). The huge intradural-extradural teratoma (arrows) was located ventrally to laterally from the C7 to the upper thoracic region. It was located dorsally in the thoracolumbar region. Large cystic parts of the tumor were also found. The spinal cord (arrowheads) was compressed and displaced. The lower margin of the dural sac was at the S5 level and the lower margin of the tumor was at the S2 level approximately. (C) Contrast-enhanced, axial T1-weighted imaging (T1WI) of the L3 level showed the extension of the tumor to the bilateral intervertebral foramina (arrows). The spinal cord and roots below T12 were severely displaced and compressed by the tumor content, which led to difficulty in differentiation with MRI. (D) Contrast enhanced axial T1WI imaging of L3 level showed the low signal dural sac (arrowheads). The dural sac was compressed and became very thin appearance. It also demonstrated that the tumor was located intradurally.
lipomeningomyelocele, syrinx, and thickened terminal filum are included, but were not seen in our case. They are connected to the skin surface and the pelvis. Intraspinal teratomas can be located intradurally or intramedullary, and are often small. They commonly originate from the dorsal or dorsolateral area. In our case, the intradural tumor was giant and extended from the dorsal to the ventral side of the spinal canal, from the C7 to the S2 level. The typical imaging findings of intraspinal teratomas are tumor masses with both solid and cystic parts and the presence of fatty components, tooth, bone, or calcification. Plain film shows the spinal canal and neuroforamen widening. Spinal computed tomography is beneficial for detecting the distribution of calcification and fatty components. MRI has the advantage of high resolution of soft tissue. The cystic part usually shows a low signal in T1-weighted imaging (T1WI) and a high signal in T2-weighted imaging (T2WI). Enhancement of the soft tissue part is noted after contrast medium injection. The most important diagnostic clue is the detection of fatty tissue by T1WI and the fat saturation sequences. Routine MRI does not easily identify the calcification or bony part of the teratoma, therefore further MR techniques for detecting calcification should be used. Gradient echo imaging was reported to be superior to fast spin echo imaging in the detection of superparamagnetic materials, such as hemorrhagic products, calcification, or teeth. The application of gradient echo imaging is suggested in patients diagnosed with spinal teratoma.

Intraspinal teratoma can be differentiated from sacrococcygeal teratoma by clinical and imaging studies. Most sacrococcygeal teratomas can be visible or palpable externally (80–90%). They are connected to the skin surface and the pelvis. Intraspinal teratomas can be located intradurally or intramedullary, and are often small. They commonly originate from the dorsal or dorsolateral area. In our case, the intradural tumor was giant and extended from the dorsal to the ventral side of the spinal canal, from the C7 to the S2 level. The typical imaging findings of intraspinal teratomas are tumor masses with both solid and cystic parts and the presence of fatty components, tooth, bone, or calcification. Plain film shows the spinal canal and neuroforamen widening. Spinal computed tomography is beneficial for detecting the distribution of calcification and fatty components. MRI has the advantage of high resolution of soft tissue. The cystic part usually shows a low signal in T1-weighted imaging (T1WI) and a high signal in T2-weighted imaging (T2WI). Enhancement of the soft tissue part is noted after contrast medium injection. The most important diagnostic clue is the detection of fatty tissue by T1WI and the fat saturation sequences. Routine MRI does not easily identify the calcification or bony part of the teratoma, therefore further MR techniques for detecting calcification should be used. Gradient echo imaging was reported to be superior to fast spin echo imaging in the detection of superparamagnetic materials, such as hemorrhagic products, calcification, or teeth. The application of gradient echo imaging is suggested in patients diagnosed with spinal teratoma.

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