

# Giant intrasacral meningocele: a case report

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**Abstract** A peculiar case of intrasacral meningocele and spinal cord tethering is reported. Contents of the intrasacral meningocele and importance of CSF flow analyses with MRI are discussed. Demonstration of CSF flow from the thecal sac to meningocele in the CSF flow MR imaging may be helpful for determining the possibility of meningocele growth. In this report, we have presented the determination of CSF flow as a new surgical indication in this type of cases.

**Keywords** Intrasacral meningocele · Tethered cord · CSF flow · MRI

## Introduction

Intrasacral meningocele is an atypical enlargement of the thecal sac on the far side of its normal termination. The communication between the intrasacral meningocele and the neighboring thecal sac is typically constituted by a one-sided ostium. CSF flows from the tip of the subarachnoid space into the meningocele through this ostium. The theories of abnormal embryogenesis suggested as explanations for the development of this anomaly. The sacrococcygeal neural elements develop after closure of the posterior neuropore. The caudal cells enlarge and undergo canalization. This occurs from the fourth to the sixth week of life. Cellular degeneration along the distal neural tube produces the filum terminale. Lying at the distal end of the filum terminale, the coccygeal medullary vestige may be the origin of the intrasacral meningocele [1, 2].

These lesions do not typically consist of neural elements [3]. The sac is composed of a fibrous tissue having the hallmarks of dura and lined by arachnoid. Sacral spinal canal is often widened and abraded. A dysraphic etiology is substantiated by an interconnection with spina bifida and tethered cord syndrome [4].

We present a case of an occult intrasacral meningocele presenting with severe constipation and low back pain and also review of the literature. We also emphasize the importance of cine mode MR imaging and CSF flow analysis contributed to the certainty of communication between the intrasacral meningocele and neighboring thecal sac.

## Case

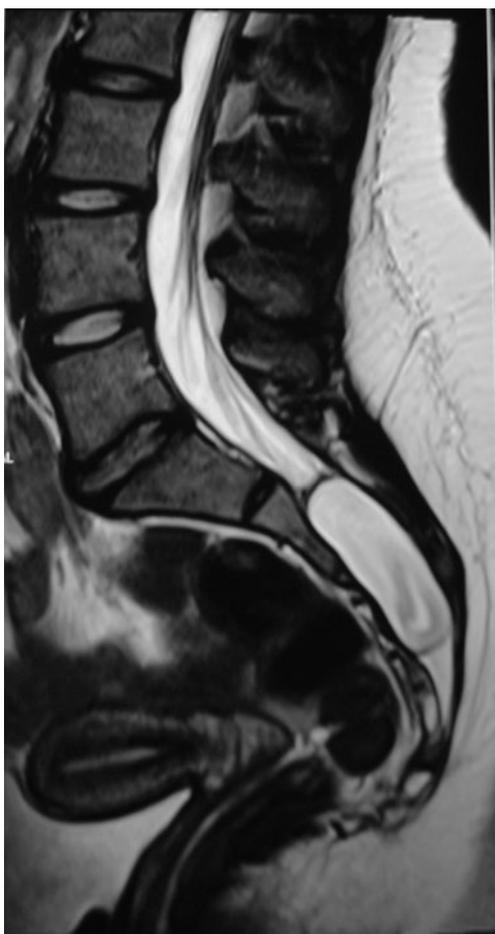
This 16-year-old girl presented with a 6-year history of constipation and low back pain. During this time period, the patient was followed by rheumatology clinics and medical therapy with non-steroidal anti-inflammatory drugs was administered and additionally she got physical therapy. She also suffered numbness in the left leg and difficulty in walking. Physical examination revealed no abnormality.

Preoperative MRI revealed spinal cord tethering and low lying conus medullaris accompanying with a large, centrally located intrasacral meningocele between S2 and S4 segments (Fig. 1). Tethered filum terminale was visible at the distal part of the thecal sac and the superior part of the meningocele. Sacral nerve roots were compressed ventrally; CSF flow analysis with MRI revealed flow from the thecal sac to the meningocele through a defect at the bottom of the thecal sac (Fig. 2).

Laminectomies were performed from S1 to S3 and the meningocele was exposed. The meningocele was observed as a pulsatile cyst in the spinal canal. The meningocele was entered from the caudal point with the help of an operating microscope and high-pressure CSF discharged from the

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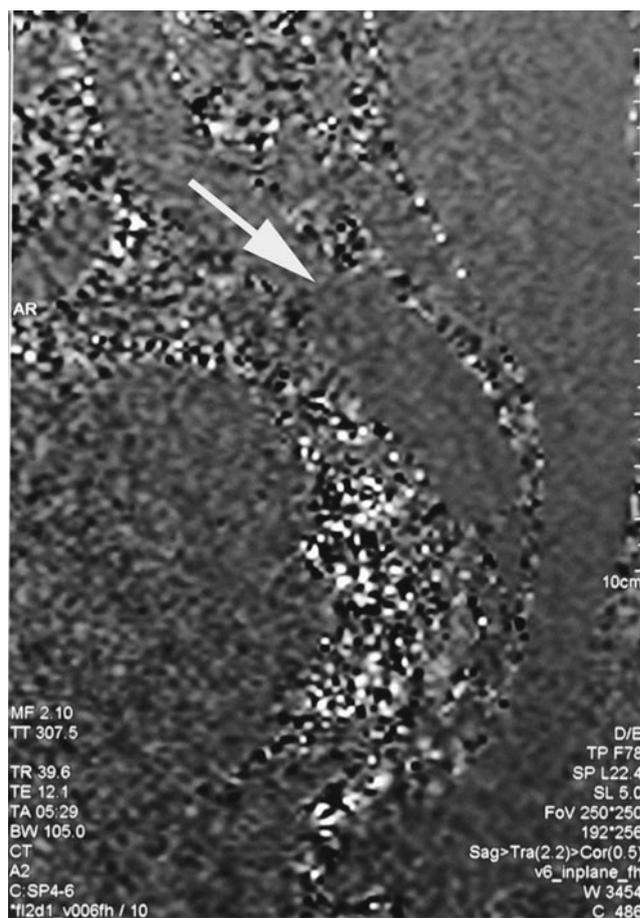
**Fig. 1** Preoperative sagittal plane-MRI revealed spinal cord tethering and low lying conus medullaris accompanying with a large, centrally located intrasacral meningocele between S2 and S4 segments

meningocele cavity. The ostium of the meningocele was observed at the superior part of the meningocele and the filum terminale was observed through the ostium (Fig. 3). Filum terminale was coagulated and untethered. Ostium was closed with 5.0 silk and the dorsal part of the meningocele wall was removed. Because of the tight adherence of ventral wall to the sacral rootlets, ventral wall was not removed.

Immediately after the procedure, numbness of the left leg and low back pain reduced. Three months after the surgery, constipation, walking difficulty, and low back pain were completely resolved. The follow-up is 2 years without any symptoms.

## Discussion

After the first description of intrasacral meningocele by Enderle in 1932, several studies reported this unique pathology [5]. The contents of the meningocele were discussed in the literature and concluded that meningocele cavity is



**Fig. 2** CSF flow analysis with MRI revealed flow from the thecal sac to the meningocele through a defect at the bottom of the thecal sac (arrow)

devoid of any other structure except CSF [3]. Three studies demonstrated tethered filum terminale settling in the meningocele cavity [4, 6, 7]. Feigenbaum discussed that tethering of the filum and the meningocele formation may occur independently but simultaneously. In the presented case, the filum terminale was attached to the inner part of the cyst cavity.



**Fig. 3** The ostium of the meningocele and the filum terminale were observed at the superior part of the meningocele (arrow)

For the most part of the patients, intrasacral meningocele is asymptomatic. When they compress the sacral rootlets, they become symptomatic and generally give rise to clinical complaints. If the tethered cord accompanies intrasacral meningocele, further complaints related with tethered cord may occur. Additionally, as a result of sacral spine erosion, patients are afflicted by lower back or buttock pain. In our case, in view of the surgical observation, the lesion was pulsatile and increased in size as a result of one-sided valve mechanism. The compression of the sacral rootlets ventrally and sacral bone erosion should be explained with this surgical observation.

MRI of the sacral region is the investigation of choice for the diagnosis [8]. If there is a question that arises concerning about the communication between the thecal sac and meningocele, cine MRI and CSF flow analyzing should be considered as a diagnostic device to demonstrate the signal void because of the unidirectional flow and estimate the probability of enlarging the cyst size. This observation should orientate to the surgery even in asymptomatic patients.

Treatment strategies for the intrasacral meningocele are still controversial. In asymptomatic cases, follow-up is suggested, while in symptomatic cases, surgery is recommended. Since the intrasacral meningocele may expand in size and there is a probability of becoming symptomatic, there is a difficulty in terms of estimating the chance of this complication. CSF flow analysis may be helpful in predicting the cyst enlargement and planning the surgical intervention as a therapeutic modality. Surgical treatment of the intrasacral meningocele is excision of the cyst via posterior approach. Since the surgical treatment is considered in symptomatic cases because of the enlargement of the cyst and compression of the sacrococcygeal nerve roots, dissection of the ventral surface of the cyst fall from the sacrococcygeal nerve roots can cause catastrophic complications. The ostium between the cyst and the thecal sac should be sutured and fascia graft can be attached to the ostium and fibrin glue can be used to prevent the regrowth

of the lesion. We observed numerous types of cases similar to our cases in the literature; nevertheless, we believe that receiving inadequate treatment for this type of well-documented lesion for 6 years should be worthy of contribution to the neurosurgical literature [1, 5, 6].

## Conclusion

As a consequence of surgical findings, cine mode MR imaging and CSF flow analysis contributed to the certainty of communication between the intrasacral meningocele and neighboring thecal sac can be considered as a reference for evaluate the likelihood growing of the meningocele.

## References

1. Doty JR, Thomson J, Simonds G, Rengachary SS, Gunby EN (1989) Occult intrasacral meningocele: clinical and radiographic diagnosis. *Neurosurgery* 24(4):616–625
2. Lamas E, Lobato RD, Amor T (1977) Occult intrasacral meningocele. *Surg Neurol* 8(3):181–184
3. Feigenbaum F (2008) Giant sacral meningeal diverticulum containing a thickened filum with lipoma in an adult with spinal cord tethering. Case report and review of the literature. *J Neurosurg Spine* 9(3):281–284
4. Feigenbaum F, Hale S (2011) Association between symptomatic giant sacral meningeal diverticulum and spinal cord tethering with thickened lipomatous filum. *Spine* 36(18):E1230–1232
5. Turgut M, Akyuz O, Unsal A (2007) Occult intrasacral meningocele: case report and review of the literature. *Zentralbl Neurochir* 68(1):34–37
6. Doi H, Toyoda I, Matsumoto K, Imai S, Sekimizu M (1995) Occult intrasacral meningocele with tethered cord—case report. *Neurol Med Chir (Tokyo)* 35(5):321–324
7. Parmar H, Shah J, Varma R, Patkar D (2001) Intrasacral meningocele with tethered cord syndrome. *J Assoc of Physicians India* 49:746–748
8. Rengachary SS, O’Boynick P, Karlin CA, Batnitzky S, Price H (1981) Intrasacral extradural communicating arachnoid cyst: cases report. *Neurosurgery* 8(2):236–240