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Case of a Newborn with Prenatal Diagnosis of a Meningocele Reclassified as Benign Cystic Teratoma

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ABSTRACT

Background: Spinal masses in neonates, such as meningoceles and teratomas, can present diagnostic dilemmas due to similar imaging characteristics. Benign cystic teratomas, while rare, can mimic meningocele on imaging, necessitating histopathological confirmation for accurate diagnosis. We report a case of a male newborn initially diagnosed with meningocele that was later reclassified as a benign cystic teratoma after surgical intervention. Further insights from literature highlight the complexities of differential diagnosis and management of these masses.

Case summary: The case of a male newborn delivered at 38 weeks of gestation, initially diagnosed with a meningocele on prenatal imaging. Mother was an operated case of Meningocele at 6 month of age with VP Shunt insitu. Post-delivery, a large, globular, midline sacrococcygeal mass covered by smooth, thin skin was noted .Postoperative histopathology reclassified the lesion as a benign cystic teratoma.

Conclusion: This case emphasizes the diagnostic challenges posed by overlapping radiological features of spinal masses and highlights the importance of histopathology in confirming the diagnosis. Surgical excision led to an uneventful recovery, underscoring the value of multidisciplinary care in achieving favorable outcomes.

Keywords: *Benign Cystic Teratoma, Prenatal, Meningocele, Outcome.*

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1. INTRODUCTION

Severe birth malformations of the central nervous system, known as neural tube defects (NTDs), happen when the morphogenetic process of neural tube closure fails during embryogenesis. Thus, failure of closure in the prospective brain and spinal cord results in anencephaly and open spina bifida (myelomeningocele), respectively.[1] The prevalence of NTDs in India has been reported to vary from 0.5 to 11 per 1000 births. [2]

In prenatal screening and the extensive use of ultrasound, congenital sacrococcygeal masses are frequently detected in the early stages of pregnancy [3]. Without affecting neural tissue, meningocele is an uncommon congenital condition marked by the herniation of a spinal cerebrospinal fluid sac bordered with leptomeninges. It makes up 2.4% of cases of spinal dysfunction and is the most basic type of neural tube malfunction. Neural tube abnormalities have a complex etiology that includes autoimmune, environmental, and genetic components. Neural tube anomalies have been linked to maternal obesity, pregestational diabetes mellitus, and genetic disorders. Nonetheless, folate insufficiency is linked to the majority of isolated meningocele cases [4].

Germ cell tumors known as teratomas are mainly made up of several cell types that originated from one or more of the three germ layers [5]. The epithelium lining a dermoid cyst includes cells and tissues that are typically found in the skin layer, such as sweat and sebaceous glands and hair follicles. Sacrococcygeal region (57%), gonads (29%), mediastinal region (7%), retroperitoneum (3%), cervical area, and cranium are the most often found places [6,7,8]. Numerous etiologies, including inflammatory, neoplastic, congenital, and traumatic diseases, can result in sacrococcygeal masses [9].In this case report, we present a case of a newborn with an isolated sacrococcygeal meningocele initially which was diagnosed as a sacrococcygeal teratoma.

CASE HISTORY:

A male newborn delivered at 38 weeks gestation with a prenatal diagnosis of a Meningocele. This mass was diagnosed at 8 months of gestation on antenatal USG and appears as an echoic cystic structure measuring 7.5*7.3*8.5 cm. The mother of the newborn was not a registered pregnancy and not had undergone any USG scans or blood investigations prior to 8 months of gestation. She had past history of two first trimester abortions. Mother was an operated case of Meningocele at 6 months of age with VP Shunt in situ. The patient was delivered via caesarian section. Patient was vitally stable on examination. On general examination, a large midline mass in the sacrococcygeal region was observed. The mass had a globular shape, was covered by smooth and thin skin and no leakage was found. On. Neurological examination, the baby was moving both upper and lower limbs, and was voiding urine spontaneously and no complained of stool incontinence. Laboratory investigations, including hematological and biochemical parameters, were within normal limits. MRI examination of spine revealed myelomeningocele a large well defined smooth walled cystic lesion is noted at the posterior aspect of L5-S1 vertebra measuring approximately 5 x 4.9 x 8 cm in its largest dimensions appearing hypointense on T1 weighted images, hyperintense on T2 weighted images and high signal on STIR. MRI brain was normal indicating favorable prognosis. After a pre operative evaluation patient was planned for Neurosurgery. Intraoperatively, we found that the herniated sac was large, had a thin vascular wall, was filled with cerebrospinal fluid which was drained, neural tissue excised detethering of cord was done and samples were sent for Histopathological analysis. H & E-stained sections reveal ed that cyst lined by stratified squamous epitheum and filled with anucleate keratin flakes. Cyst wall shows neuropil like matrix with ganglion cells, fibro collagenous stroma with variable sized blood vessels, few eccrine glands, skeletal muscle and adipose tissue. HPE report brought a surprise as it was reported as benign cystic teratoma. The Patient was treated by surgery and no any postoperative complications found. On neurological examination in the postoperative period found no any abnormality. The wound at the surgical site healed satisfactorily. Follow up of the patient was done in Neurology Department OPD.

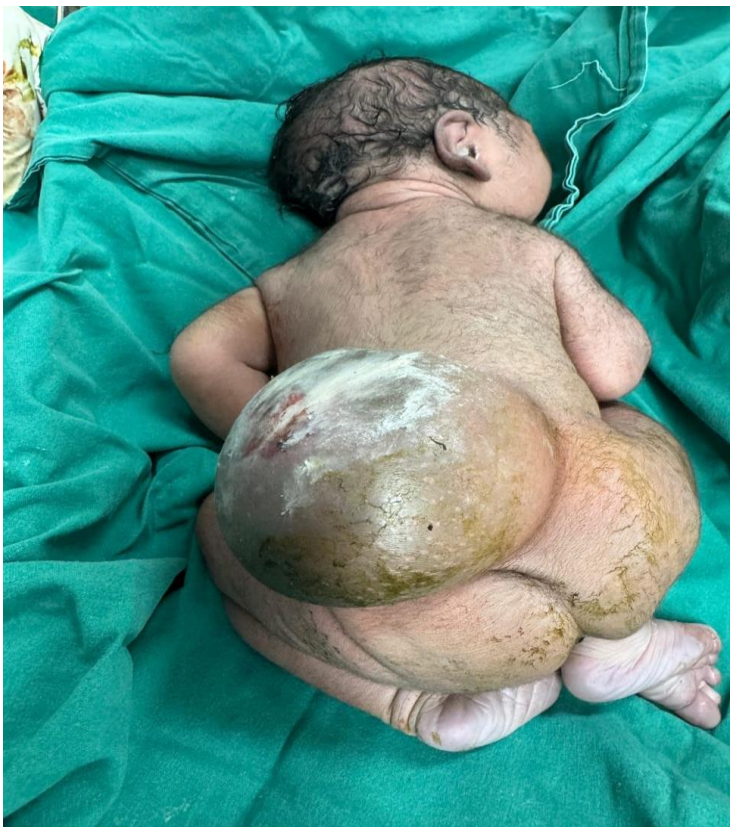

Figure 1: Preoperative image of the newborn showing a large, smooth, midline sacrococcygeal mass covered with intact skin, suggestive of meningocele on antenatal USG.

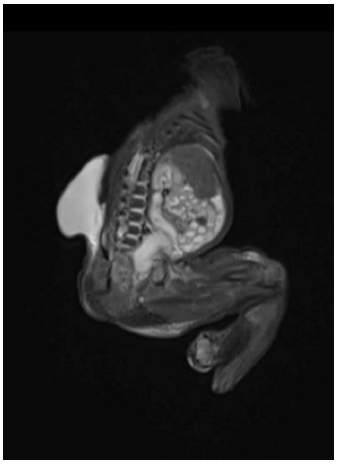

Figure 2: MRI sagittal section showing a well-defined cystic lesion arising from the sacrococcygeal region, hypointense on T1 and hyperintense on T2 — initially interpreted as meningocele.

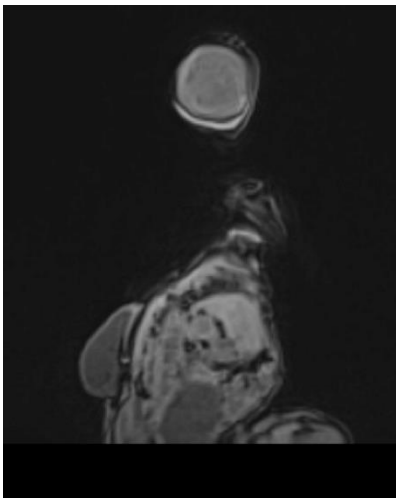

Figure 3: MRI coronal/axial view demonstrating the lesion's extent and mass effect, highlighting the need for differentiation from spinal dysraphism.

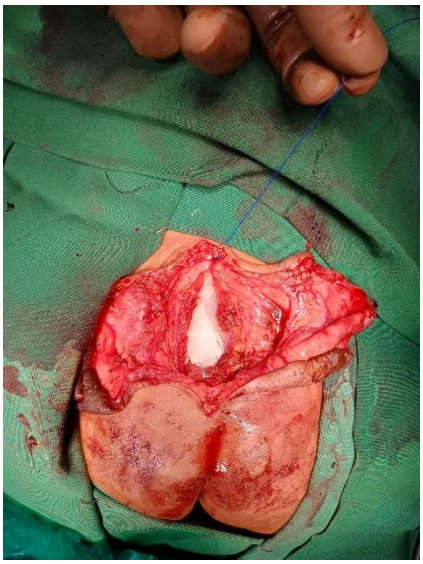

Figure 4: Base of the mass after CSF drainage and excision of neural tissue. The wound bed appears clean with good tissue planes.

2. DISCUSSION:

Neural Tube Defects (NTDs) arise secondary to abnormal embryonic development of the future central nervous system. The two most common types of NTDs are spina bifida and anencephaly, affecting different levels of the brain and spine, normally reflecting alterations of the embryonic processes that form these structures. Birth defects such as NTDs are relatively uncommon, with a global prevalence among live births in the US of 1 in 1200, and a worldwide prevalence ranging from 1 in 1,000 (in Europe and the Middle East) to 3–5 in 1,000 (in India). Many factors, both genetic and non-genetic, are involved in the abnormal closure of the neural tube, suggesting that multi-factorial causes lead to the development of NTDs. Females were more affected compared to males. Non-genetic risk factors include exposure to a broad range of environmental exposures such as air pollution and maternally toxic factors including disease, nutrition, exposure to occupational chemicals or physical agents and abuse of substance. [10]

Prenatal ultrasound imaging usually detects almost all types of NTDs. [11] In myelomeningocele, a cystic mass protruding though a bony defect in the vertebral arches is detectable. The size and shape of the lesion can vary significantly and may include cerebrospinal fluid drainage. The neural tissues appears translucent through the protruded meningeal sac and the neural placode, a segment of flat, non-neurulated embryonic neural tissue, is externally shown and protrudes above skin surface. Myelomeningecele and myelocele are usually associated with Chiari malformation type II, because of the traction of the brain stem from below due to tethering of the open spinal cord through the vertebral defect. Indeed, the brain stem is elongated, there is caudal elongation of the medulla and the fourth ventricle, cerebellar vermis is displaced into the foramen magnum. As a result, the normal flow of cerebrospinal fluid through the ventricles is compromised, resulting secondarily in hydrocephalus. There is also an abnormal orientation of the cervical nerve roots that lack their usual downward oblique orientation.[10]

Differential diagnosis of NTDs using prenatal ultra- sound should include sacrococcygeal teratoma, cystic hygroma, hemangioma, hemangiolymphangioma, scalp edema/ cephalohematoma, epidermal scalp cyst, branchial cleft cyst, dermoid cyst of the anterior fontanelle, dacryocystocele, epignathus, and cervical teratoma. [12]

In research of O.I. Alatise et al, [13] females were Moore affected while in our study males is affected.

In current research, on general examination of patient, a large midline mass in the sacrococcygeal region was observed. The mass had a globular shape, was covered by smooth and thin skin and no leakage was found. On. Neurological examination, the baby was moving both upper and lower limbs, and was voiding urine spontaneously and no complained of stool incontinence. Study done by G. Frongia et al, [14] observed that Clinical examination revealed a large 8 × 10 × 10cm sacral mass covered by intact skin and both hips in pronounced flexion and external rotation position. The remaining examination, including neurological examination, was unremarkable and the girl had regular bowel movements and urination during the neonatal period.

Our case was treated by neurosurgery and no any postoperative complications was found. After MMC patients are born, they go through multiple surgeries and must be looked after by specialized teams. Their list of concerns is rather long, ranging from neurological deficits to sphincter disturbances, potential renal involvement, orthopedic deformities, the need for rehabilitation, and so on .From a neurosurgical perspective, the surgical closure of a spinal lesion should be carried out within 72 hours after birth to reduce the risk of central nervous system infection and to improve outcomes. [15]

3. CONCLUSION:

This report details the case of a male newborn delivered at 38 weeks of gestation, initially diagnosed with a meningocele on prenatal imaging. Postoperative histopathology reclassified the lesion as a benign cystic teratoma. This case emphasizes the diagnostic challenges posed by overlapping radiological features of spinal masses and highlights the importance of histopathology in confirming the diagnosis. Surgical excision led to an uneventful recovery, underscoring the value of multidisciplinary care in achieving favorable outcomes.

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