ID: IJARS/2013/6391:1994

Case Report

Obstetrics and Gynaecology Section

Meckel – Gruber Syndrome - A Case Report

SHANTHI, SASIREKA, UPASANA RANGA

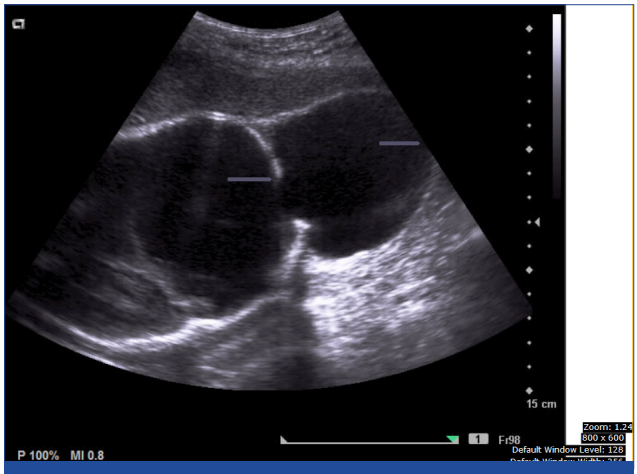
ABSTRACT

Meckel Gruber syndrome (MGS) is a rare autosomal recessive lethal disorder involving multiple systems. The classical triad includes occipital encephalocele, polycystic kidneys and post-axial polydactyly. We report a rare case of MGS which was diagnosed by antenatal ultrasound examination and confirmed at neonatal autopsy.

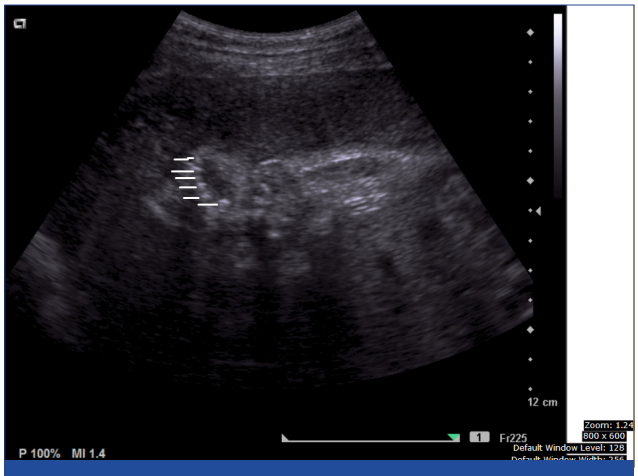
Keywords: Polycystic kidneys, Polydactyly, Occipital, Encephalocele

CASE PRESENTATION

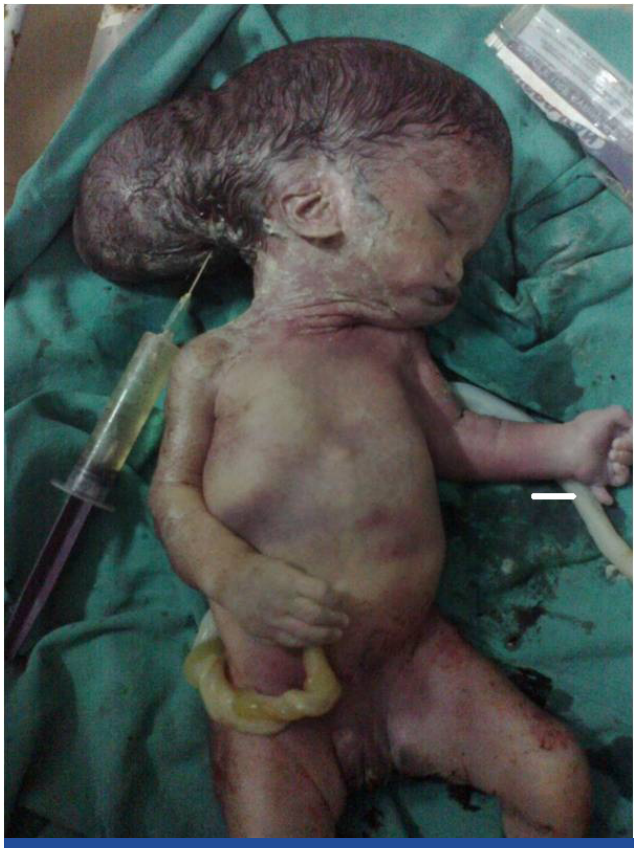
A 25-year-old lady G3P1L1A1 presented to the obstetric department for the first time, with history of 8 months amenorrhea for routine antenatal examination. There was history of third- degree consanguinous marriage. She had a four years old male child and an MTP done at 40 days of amenorrhea. For this pregnancy, she had her antenatal examination at a peripheral hospital. She was immunized and was taking iron and folic acid. USG done outside in second trimester was reported normal. Ultrasound done at our hospital as a routine, revealed fetus with occipital meningocele, bilateral enlarged echogenic kidneys, polydactyly, bilateral hypoplastic lungs and severe oligohydramnios [Table/Fig-1 and 2]. The family was counseled and after getting consent, termination of pregnancy was planned. Patient was induced and delivered vaginally. It was a dead girl baby, weighing 2.1 kg and was sent for fetal autopsy [Table/Fig-3]. On external examination head showed meningocele. No brain substance seen in the sac. Kidneys were enlarged, with lobulated external surface. Cut surface of both kidneys showed cystic areas of size 0.5 cm. Microscopic examination showed dilated tubules lined by flattened cells. Postaxial polydactyly (6 digits) was noted in all four limbs. The lungs were grossly hypoplastic. Other visceral organs were normal. Based on above features pathological diagnosis of MGS was made.



[Table/Fig-1]: Sonographic intrauterine picture showing defect in the cranium (left arrow) and herniating meninges (right arrow)



[Table/Fig-2]: Sonographic intrauterine image with polydactyly (six digits)



[Table/Fig-3]: Still born fetus with polydactyly and meningocele

DISCUSSION

Meckel Gruber syndrome is a rare autosomal recessive disorder, involving multiple systems. It is also called as "dysencephalia splanchnocystica" [1]. The most consistent triad of features are occipital encephalocele, polycystic kidneys and post-axial polydactyly [2-4]. It has wide phenotypic variations showing abnormalities of lip, palate, eye, ductal plates of liver, cardiovascular systems and genital systems [2,3,5]. A high incidence is reported in Finnish population and Gujarati Indians [3,6]. MGS is a lethal syndrome, generally results in intrauterine death or neonatal death. A high risk (25%) of recurrence in subsequent pregnancies is an important point for consideration and stresses the need for prenatal diagnosis in expectant mothers in those families. Prenatal diagnosis of MGS can be done by trans-vaginal ultrasound scan at 11 to 14 wks of gestational age [6]. We report a case of MGS diagnosed by antenatal ultra-sonogram and subsequently confirmed by neonatal autopsy.

Meckel Gruber Syndrome is prevalent worldwide, with reported incidence as 1 in 13,250 to 1 in 40,000 live births [5,6]. A disproportionately higher incidence is seen in Finland, Belgium and in Gujarati Indians [3,6]. The disease affects all races, with males and females being equally affected [1,6]. It is an autosomal recessive genetic anomaly with 1 in 4 (25 %) chance of recurrence in subsequent pregnancy.

Meckel Gruber syndrome can be associated with wide variety of abnormalities, although the classical triad includes dysplastic kidneys (95-100%), occipital encephalocele (80-90%) and polydactyly (75-85%) [2,7]. Presence of 2 of the 3 classical findings or 2 other anomalies in addition to one classical finding is sufficient for the diagnosis of MGS [8].

In addition to classical findings various anomalies involving multiple organ systems have been reported. The central nevous system malformations include microcephaly, cerebellar hypoplasia, ventriculomegaly, anencephaly, absence of corpus callosum and absence of olfactory tract or lobe [5]. One of the most constant features of MGS is occipital encephalocele, a neural tube defect. MGS accounts for 5% of all neural tube defects [7]. Hence presence of occipital encephalocele indicates the need to search for other abnormalities to assess the recurrence risk in future pregnancy. In general recurrence of a neural tube defect is 1-3% in a given family, whereas recurrence of MGS is 25% due to autosomal inheritance pattern [3]. In our case, meningocele was present.

Kidneys are grossly enlarged (10 to 20 times) by midtrimester due to cystic changes [2,6]. Cystic dysplasia of the kidneys is the constant characteristic feature of MGS leading to oligo-hydramnios. This results in pulmonary hypoplasia which is the main cause of death [6]. Other urinary system abnormalities may include horse shoe kidney, missing ureters and hypoplastic urinary bladder [5]. In our case, enlarged dysplastic kidneys and pulmonary hypoplasia were detected by ultrasound and confirmed by autopsy.

Postaxial polydactyly is a frequent finding in MGS [1,6]. Club foot is common because of oligohydramnios [5]. In our case, postaxial polydactyly with presence of sixth digit was seen in all four limbs..

Periportal fibrosis with bile duct proliferation is another common finding in MGS [2,9]. Other organ involvement include cardiac malformations, hypoplastic or ambiguous genitalia, cleft lip, cleft palate, fissured tongue, atypical face with short nose, low set ears, micrognathia, short neck, shortening and bowing of long tubular bones [2,5,6]. In the present case, however the hepatic, cardiac and genital malformations were not present.

MGS has to be differentiated from other syndromes. The most likely syndrome to be confused with MGS is trisomy 13 [8]. Although the dismal outcome is the same for both, the recurrence rate is different. Trisomy 13 is mostly sporadic with low recurrence rate whereas MGS has 25% recurrence rate. Other syndromes similar to MGS are trisomy 18, Joubert syndrome, Bardet –Biedle syndrome and Smith- Lemli-Obitz syndrome [7,8,10].

MGS can be best diagnosed by USG done as early as 11 to 14 weeks of gestational age. Neonatal autopsy confirms the diagnosis, while genetic study helps in assessment of recurrence [8].

CONCLUSION

Meckel Gruber syndrome is a lethal disorder with a high recurrence risk. Target scan should be done in early second trimester in every pregnancy to detect these anomalies and counsel the family for termination of pregnancy. Family should be counseled regarding recurrence and the need for an early ultrasonography in subsequent pregnancy.

REFERENCES

[1] Salonen R, Paavola P, Meckel syndrome. *Journal of Medical Genetics.* 1998; 35: 497-501.
[2] Gupta M, Mehta A, Gupta R, Gupta R, Singh S. Prenatal diagnosis of Meckel Gruber Syndrome with Dandy Walker Malformation-Case report. *JK Science.* 2005; 7(3): 164-66
[3] Young I D, Rickett AB, Clarke M.High incidence of Meckel's syndrome in Gujarati Indians. *Journal of Medical Genitics.* 1985; 22: 301-04.
[4] Wright C, Healicon R, English C, Burn J. Meckle syndrome: what are the minimum diagnostic criteria? *Journal of Medical Genitics.* 1994; 31: 482-85.
[5] Balcy S,Onal B, Ercal MD, Beksac S, Erzen C, Akban O. Meckel Gruber Syndrome. A case diagnosed in utero. *Turk J Paediatric.* 1992; 34: 179-85.
[6] Naveen N.S.,Vishal K. VinayK.V. Meckel Gruber Syndrome – A case report. Nitte University Journal of Health Science. Vol.3, No.1, March2013, ISSN 2249-7110: 83-85.
[7] Nyberg DA, Hallesy D, Mahony BS, et al. Meckel Gruber Syndrome:importance of prenatal diagnosis. *J Ultrasound Med.* 1990 9: 691.
[8] Alexiev BA, Lin x, Sun CC, Brenner DS . Meckel Gruber Syndrome: pathological manifestations, minimal diagnostic criteria and differential diagnosis. *Arch Pathol Lab Med.* 2006;130:1236-8. [PubMed]
[9] Cinncinati P,Neri ME, Valentini A. Dandy-Walker anomaly in Meckel Gruber Syndrome. *Clin Dysmorphol.* 2000;9:35-38
[10] Chen CP. Meckel Syndrome: Genetics, perinatal findings, and differential findings. *Taiwanese J Obstet Gynecol.* 2007; 46: 9-14.

AUTHOR(S):
1. Dr. Shanthi
2. Dr. Sasireka
3. Dr. Upasana Ranga

PARTICULARS OF CONTRIBUTORS:
1. Department of Gynecology, Saveetha Medical College, No.162, Poonamalle High Road, Chennai-6000077, India.
2. Department of Gynecology, Saveetha Medical College, No.162, Poonamalle High Road, Chennai-6000077, India.
3. Department of Radiology, Saveetha Medical College, No.162, Poonamalle High Road, Chennai-6000077, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. E. Shanthi,
No. 16/10, Vellalar street, 4th lane (Kamaraj street),
Ayanavaram, Chennai-600023, Tamil nadu, India
Phone: 09444105593
E-mail: dreshanthi@gmail.com

FINANCIAL OR OTHER COMPETING INTERESTS:
None.

Date of Publishing: **Dec 31, 2013**