Case Report

A rare case of Meckel-Gruber syndrome: Antenatal diagnosis

Nidhi Gupta\(^1\)*, Seema Singhal\(^2\)

\(^1\)Department of Obstetrics & Gynaecology, Hamdard Institute of Medical Sciences and Research & HAHC Hospital, New Delhi
\(^2\)Department of Obstetrics & Gynaecology, All India Medical Institute of Medical sciences & Research, New Delhi

Abstract

Meckel-Gruber syndrome (MGS) is a lethal autosomal recessive condition which is rarely reported. Polycystic kidneys, polydactyly, occipital encephalocele are the diagnostic triad for MGS. A 24 year old G2P1L1 having a consanguineous marriage at 20 weeks of gestation on detailed level II anomaly scan showed bilateral enlarged polycystic kidneys with increased echogenicity, absent urinary bladder, posterior occipital encephalocele, bowing of femur, absent liquor. Features were suggestive of Meckel-Gruber syndrome and baby delivered vaginally. Gross examination and autopsy confirmed the diagnosis. Early diagnosis is important with ultrasound as early as 11-14 weeks, chorionic villous sampling at 14 weeks and targeted scan in early second trimester in every pregnancy to detect these anomalies.

Key Words:

Meckel Gruber Syndrome, occipital encephalocele, genetic counselling

Introduction

Meckel-Gruber syndrome (MGS) was originally described by Meckel in 1822 & later by Gruber in 1934. [1] MGS is also called Dysencephalia Splanchniocystica. [1] This syndrome is seen in all races and ethnic communities, highest incidence in the Finnish population (1 in 9000). [2] Among Indians it is more common in Gujarati’s population. 200 reported cases till date with an equal incidence in both sexes. Defective gene for MKS is found to be on Chromosome bands 17q21-q24, 11q13 and 8q24. [3] This results in 100% mortality either intra-uterine or in immediate neonatal period. This syndrome is having a classical triad of multicystic dysplasia of kidney, occipital encephalocele, and polydactyly, which are observed in 100%, 90%, and 83.3% cases, respectively. Besides the clinically recognized classic malformations, it can be variably associated with oral clefting, central nervous system (CNS) malformations such as anencephaly, holoprosencephaly, polymicrogyria, cerebellar hypoplasia, pulmonary hypoplasia, and hepatic fibrosis. [4, 5] MKS is a rare disease and invariably lethal in early infancy, large clinical series of patients that address epidemiological and clinical findings are scarce. There is also very limited data published on any type of birth outcomes—live births (LB), fetal deaths (FD), and terminations of pregnancy after prenatal diagnosis (TOPFA) in MKS patients. [6] The aim of this case report is to increase the awareness among obstetricians and radiologists regarding this rare and lethal syndrome. All the foetuses with any congenital malformation should advice autopsy so that if MKS is present then recurrence risk can be explained to the parents.

Case Presentation

A 24 year old G2P1L1 having a consanguineous marriage presented to Safdarjung outpatient department at 20
weeks of gestation. She was having an ultrasound report suggesting fetal anomaly and was admitted in view of same USG. On examination, her vitals were stable, uterine height was 16-18 weeks and liquor seemed to be clinically reduced. Her previous pregnancy resulted in a full term normal vaginal delivery 2 years back. Baby boy was healthy and alive. After admission detailed level II anomaly scan was done showing following feature as shown in Figure 1.

![Figure 1.](image)

**Bilateral enlarged polycystic kidneys with increased echogenicity**

Diagnosis of MECKEL-GRUBER SYNDROME was made on the basis of characteristic triad. Patient was induced after taking informed written consent and delivered vaginally without any intra-partum or postpartum complications. Gross examination of the baby was done and following findings like absent urinary bladder, posterior occipital encephalocele, bowing of femur, absent liquor, large abdominal masses and normal female genitalia were noted. The baby’s karyotype analysis has been found as 46,XX. Parents were given the option of autopsy and karyotyping. They were willing for the same. Autopsy was done and the findings were enumerated below and shown in Figure 4. Patient was discharged in stable condition after 4 days. On discharge, patient was explained about the 25% recurrence chance. So importance of prenatal counseling and early detection in next pregnancy by ultrasonography as early as 11-14 weeks was told to her.

![Figure 2.](image)

**Occipital encephalocele is shown**

**Discussion**

Meckel Gruber syndrome is a rare autosomal recessive disorder, involving multiple systems. [1] This syndrome is having very high recurrence risk so high vigilant approach should be kept in mind to diagnose this syndrome. A large number of case reports have already been reported but only few were having all the features suggestive of the syndrome. So we are reporting this case as our case was having all the features specially the classical triad of this syndrome and it was diagnosed at an early gestation which was not so common in the earlier case reports. In our case, all features typical of MGS were diagnosed in antenatal period by targeted level scan at 20 weeks of gestation. The final diagnosis was made after autopsy of the fetus. 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%) [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]. One of the most constant features of MGS is occipital encephalocele, a neural tube defect. MGS accounts for 5% of all neural tube defects [9]. Hence presence of occipital encephalocele indicates the need to search for other abnormalities to assess the recurrence risk in fu-
ture 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 [9]. In our case, occipital encephalocele was present. Kidneys are grossly enlarged (10 to 20 times) due to cystic changes which can be palpated as abdominal masses [7].

Figure 3.

Post-axial polydactyl of all the four limbs is shown.

Cystic dysplasia of the kidneys is the constant characteristic feature of MGS leading to oligohydramnios which results in pulmonary hypoplasia. All these features were present in our case. Other urinary system abnormalities may include horse shoe kidney, missing ureters and hypoplastic urinary bladder [9]. In our case, these abnormalities were absent. Postaxial polydactyly is a frequent finding in MGS [10]. Club foot is common because of oligohydramnios [9]. 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 [7]. 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 [7, 10]. 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 –Biedl syndrome and Smith- Lemli-Obitz syndrome [8, 11]. Meckel Gruber syndrome is a lethal disorder with a high recurrence risk (25%). In countries with high rates of consanguineous marriage, one should be careful and genetic counselling should be advised. In the cases with consecutive losses of pregnancy or previously affected pregnancy, early diagnosis is important. Ultrasound as early as 11- 14 weeks, chorionic villous sampling at 14 weeks and targeted scan in early second trimester in every pregnancy to detect these anomalies help in making diagnosis. [7, 8] Recurrence risk is to be explained to the family in first affected pregnancy.

Figure 4.

Autopsy findings which demonstrate bilateral enlarged polycystic kidneys, pulmonary hypoplasia and absent urinary bladder.

Acknowledgement
None

Declaration of Interest
None
References