



MECKEL–GRUBER SYNDROME – A RARE CONGENITAL ANOMALY

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ABSTRACT

Aim: This study is aimed to stress the importance of prenatal tests and fetal autopsy after abortion to confirm the syndrome and counseling for abortion and evaluation of recurrence risk in the future pregnancies.

Case report: A 25 year old female, G3P1L1A1 admitted for termination of pregnancy due to multiple anomalies which was revealed by ultrasound examination. Termination of pregnancy followed by foetal autopsy was carried out. A definitive diagnosis of Meckel-Gruber syndrome was made out by morphological examination and histopathological examination.

Discussion: Meckel-Gruber syndrome is a rare autosomal recessive disorder, characterized by occipital myeloencephalocele, bilateral renal cystic dysplasia, hepatic ductal proliferation, fibrosis and cysts, and polydactyly. But the characteristic clinical triad consists of occipital encephalocele, polycystic kidneys and postaxial polydactyl. Locus heterogeneity is a feature of Meckel-gruber syndrome.

Conclusion: Meckel-gruber syndrome is a rare and lethal congenital anomaly.

Key words: Meckel-gruber syndrome, fetal autopsy, polycystic kidney disease, polydactyly

INTRODUCTION

Meckel-gruber syndrome (MGS) is a rare autosomal recessive disorder. It is a lethal congenital anomaly characterized by presence of occipital meningocele, bilateral dysplastic kidneys and polydactyly. We report a rare case of Meckel-gruber syndrome aborted at 32 weeks of gestation for which fetal autopsy was done.

CASE HISTORY

25 year old female, G3P1L1A1 admitted for termination of pregnancy due to multiple anomalies. She was booked outside for present pregnancy.

Ultrasound examination: Occipital meningocele, bilateral dysplastic kidneys, hypoplastic lungs, marked oligoamnios and polydactyly.

Patient expelled dead born female foetus

AUTOPSY FINDINGS

32 weeks female fetus with crown rump length of 33cm, chest circumference of 22cm. Polydactyly (Six digits) noted in all four limbs (Figure 1 and 2).



Figure 1: Gross image showing polydactyly (Six digits) in upper limbs.

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Received: 21.3.2014

Revised: 24.4.2014

Accepted: 01.06.2014

Segment of umbilical cord measured 10cm in length and showed two arteries and one vein.

Head circumference measured 45 cm and it showed features of meningocele (Figure 3). No cleft lip or cleft palate present. Two incisor teeth were identified in the oral cavity.

Body opened by midline incision from symphysis menti to symphysis pubis passing left to umbilicus. On opening of thoracic and abdominal cavity the disposition of organs were normal.



Figure 2: Gross image showing polydactyly (Six digits) in lower limbs.

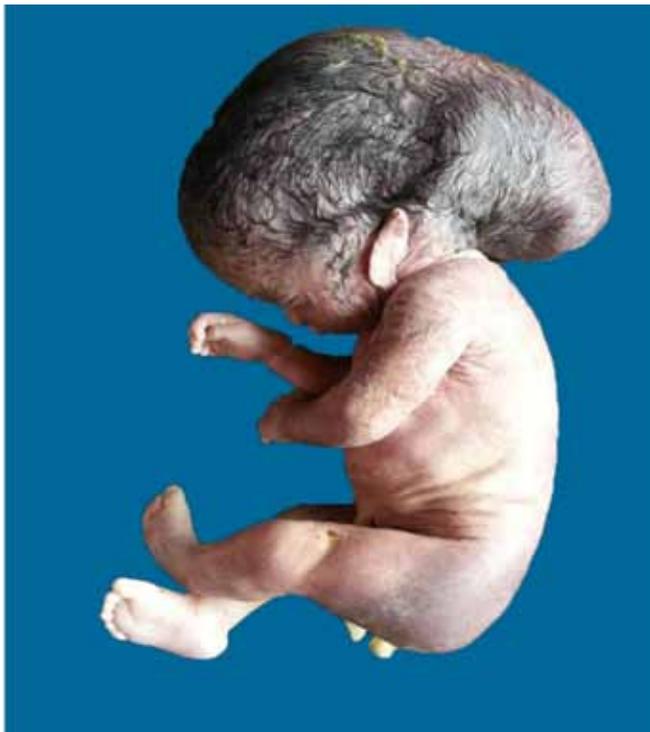


Figure 3: Gross image showing meningocele.

Thorax, Heart and major blood vessels, thymus, Gastro intestinal tract, liver, spleen and genital system were found to be normal.

Lungs were grossly hypoplastic. Adrenals showed haemorrhage.

Right kidney weighed about 20gm and left kidney was 15gm. External surfaces showed lobulation. Cut surface of both kidneys showed cystic areas of size 0.5cm (Figure 4). Sections were taken from appropriate sites.

MICROSCOPIC FEATURES

Section taken from meningocele showed meninges with congested vessels. No brain substance seen.

Microscopically sections from both kidney showed primitive glomeruli and primitive tubules with dilated tubules lined by flattened cells and surrounded by immature mesenchyme. No cartilaginous elements seen. (Figure 5, 6)

DISCUSSION

Meckel-gruber syndrome (MGS) is otherwise called as Dysencephalia splanchnocystica ⁽¹⁾. It was first described by Johann Friedrich Meckel and it is a rare autosomal recessive lethal disorder.

The incidence worldwide has been reported as 1:13,250 to 1:140,000⁽²⁾. Finnish and Gujarati Indians show an increased incidence of this condition. ⁽³⁾

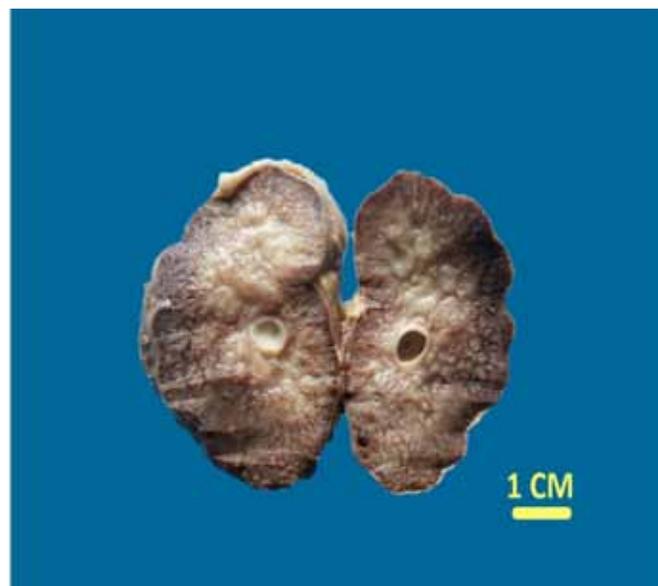


Figure 4: Cut surface of the kidney showing cysts.

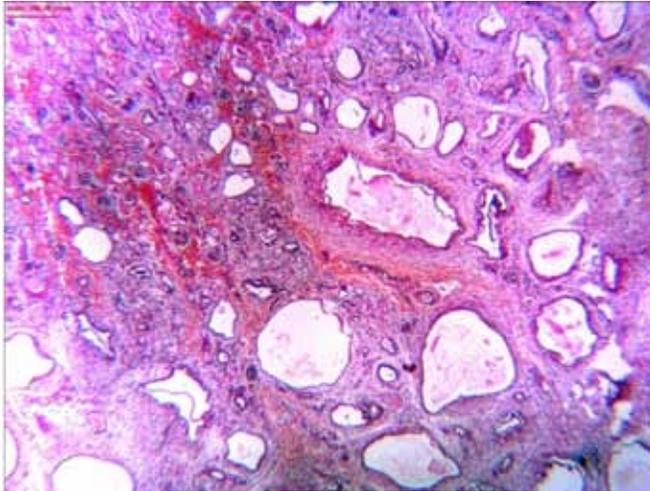


Figure 5: H&E (10x) Renal tissue with dilated tubules.

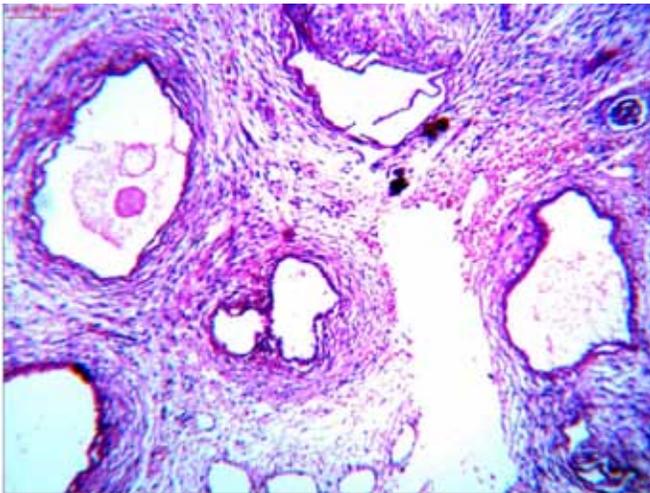


Figure 6: H&E (40x) Renal tissue with dilated tubules surrounded by immature mesenchyme.

Meckel-gruber syndrome is characterized by occipital myeloencephalocele, bilateral renal cystic dysplasia, hepatic ductal proliferation, fibrosis and cysts, and polydactyly⁽⁴⁾. But the characteristic clinical triad consists of occipital encephalocele, polycystic kidneys and postaxial polydactyly. At least two of these features are essential for the diagnosis. Microcephaly, cleft palate and ambiguous genitalia may also be present in Meckel-gruber syndrome.⁽⁵⁾

Meckel-gruber syndrome can be diagnosed prenatally by ultrasound findings at 11 to 14 weeks of gestational age. Alfa fetoprotein can also be measured in the maternal serum but it is not elevated when the encephalocele contain a closed sac (6).

It can occur following artificial insemination like in vitro fertilization. Celentano et al reported a case of MGS diagnosed at 17 weeks in a pregnancy obtained with intracytoplasmic sperm injection (ICSI)⁽⁷⁾.

Three genes (MKS1, MKS2 and MKS3) have been identified. MKS1 located on chromosome 17q, MKS2 is on chromosome 11q and MKS3 is on chromosome 8q or 13q. Locus heterogeneity is a feature of Meckel-gruber syndrome since the presence of phenotype variability⁽⁸⁾.

CONCLUSION

We present this rare and interesting case of Meckel-gruber syndrome. In our case there was no consanguinity, presented with meningocele, bilateral cystic renal dysplasia and polydactyly of all four limbs. Although improved prenatal testing like ultrasound, serum alfa fetoprotein estimation and karyotyping has increased, the detection of Meckel-gruber syndrome, morphological confirmation by fetal autopsy remains valuable diagnostic tool. In pregnancy complicated by this syndrome, counselling for abortion and evaluation of recurrence risk in the future pregnancies are important.

ACKNOWLEDGEMENT

Authors acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.

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