

RESEARCH ARTICLE

INCIDENCE AND OUTCOME OF MYELOMENINGOCELE WITH SURGICAL MANAGEMENT AT MEDICAL COLLEGE HOSPITAL, BIKANER

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ABSTRACT

Myelomeningocele is a neural tube defect characterized by a cleft in the vertebral column with a corresponding defect in the overlying skin leading to protrusion of the meninges and spinal cord through the defect. Myelomeningocele is the most common congenital malformation of the central nervous system. The incidence of myelomeningocele has decreased all over the world significantly in the last decade. However the incidence is much higher in India and other developing countries. The present study aims at finding the incidence of myelomeningocele in northwestern Rajasthan and to evaluate the outcome of myelomeningocele after surgery. The study was conducted at Medical College Hospital, Bikaner.

INTRODUCTION

NTDs are common congenital malformations and a major cause of death in developing countries. MMC is the commonest dysraphic malformation. MMC may occur in any part of the spine but it is predominantly observed in the lumbosacral region (Lanigan, 1993). The incidence of NTDs reported in India ranges from 0.5 to 11 per 1000 live births (Koumudi *et al.*, 2009). MMC is characterized by herniation of the meninges and myelodysplastic neural tissue through bifid spine. Surgery is the treatment of this malformation and maximal closure of the skin and dura defect with optimal preservation of neurological functions is the main goal of the surgery (Humpreys, 1996).

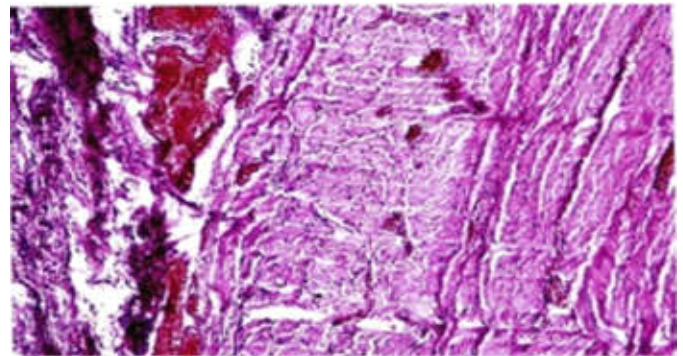
MATERIAL AND METHODS

The present study was carried out on all the patients who presented with MMC at S.P. Medical College associated P.B.M. Hospital, Bikaner during October 2013 to October 2015 period. General, physical and neurological examinations were carried out on all patients. All patients were investigated and then the patients were treated by the same surgeon. The surgical technique employed involved separation of the neural tissue from the superficial layers, their return into the spinal canal, canal reconstruction, approximation of paravertebral muscle, fascia and wound closure.

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Picture depicting histopathology of MMC



Observations

In the present study, we screened 110 cases of MMC. Out of them 69 were males and 41 were females. In the present study, out of the 36 patients operated, 11 patients presented with leaking/ ruptured sacs whereas in 23 patients sacs were found intact, 1 presented with infected sac and 1 had hydrocephalus.

DISCUSSION

Neural tube defect can occur anywhere along the neuraxis from the developing brain to the sacrum (Frey and Hauser, 2003; Pang, 1992). These can be divided into two main groups i.e. cranial or spinal. The incidence of these lesions has significantly decreased all over the world, particularly in the developed countries, however, this is not the situation in the developing countries (Mahapatra, 2012).

Table 1. Distribution of cases according to sex

| Sex | No. of Cases | Percentage |
|--------|--------------|------------|
| Female | 41 | 37.3 |
| Male | 69 | 62.7 |
| Total | 110 | 100 |

Table 2.

| Distribution of cases according to area | | |
|---|--------------|------------|
| Area | No. of Cases | Percentage |
| Rural | 81 | 73.6 |
| Urban | 29 | 26.4 |
| Total | 110 | 100 |

Table 3.

| Incidence of cases of meningocele patients | | | |
|---|-------|------|--|
| | No. | % | |
| Total Number of Live Births | 35425 | 100 | |
| Total Number of MMC patients | 110 | 0.3 | |
| Total Number of Patients Operated | 36 | 32.7 | |
| Total Number of patients managed conservatively or referred | 74 | 61.3 | |

Table 4.

| Distribution of cases according to associated anomalies (n=110) | | |
|---|-----|-----|
| Associated Anomalies | No. | % |
| Arnold Charii Malformation | 8 | 7.3 |
| Hydrocephalus | 5 | 4.5 |
| C.T.E.V. | 4 | 3.6 |
| Anorectal malformation | 2 | 1.8 |
| Cleft Lip & Palate | 2 | 1.8 |
| Kyphoscoliosis | 2 | 1.8 |

Table 5.

| Distribution of cases according to birth weight | | |
|---|--------------|------------|
| Birth Weight (kg) | No. of Cases | Percentage |
| ≤2.00 | 14 | 12.7 |
| 2.01-2.50 | 55 | 50.0 |
| >2.50 | 41 | 37.3 |
| Total | 110 | 100 |

Table 6:

| Distribution of cases according to age of baby | | |
|--|--------------|------------|
| Age of Baby | No. of Cases | Percentage |
| <1 month | 13 | 11.8 |
| 1-12 month | 89 | 80.9 |
| >12 month | 8 | 7.3 |
| Total | 110 | 100 |

Table 7. Distribution of cases according to location of Defect

| Location of Defect | No. of cases | Percentage |
|--------------------|--------------|------------|
| Lumbosacral | 62 | 56.4 |
| Lumbar | 34 | 30.9 |
| Thoracic | 10 | 9.1 |
| Occipitocervical | 4 | 3.6 |
| Total | 110 | 100 |

Table 8. Distribution of operated cases according to Size of Defect

| Size of Defect(cms) | No. of cases | Percentage |
|---------------------|--------------|------------|
| <2 | 10 | 27.8 |
| 2-2.5 | 19 | 52.8 |
| >2.50 | 7 | 19.4 |
| Total | 36 | 100 |

Table 9.

| Distribution of operated cases according to anal sphincter involvement | | |
|--|--------------|------------|
| Anal Sphincter Involvement | No. of Cases | Percentage |
| Present | 18 | 50.0 |
| Absent | 18 | 50.0 |
| Total | 36 | 100 |

Anal sphincter was involved in 50% of cases.

Table 10. Distribution of operated cases according to lower limb paresis

| Lower Limb Paresis | No. of Cases | Percentage |
|--------------------|--------------|------------|
| Present | 16 | 44.4 |
| Absent | 20 | 55.6 |
| Total | 36 | 100 |

Table 11. Distribution of operated cases according to presentation

| Presentation | No. of Cases | Percentage |
|----------------------|--------------|------------|
| Leaking/ruptured sac | 11 | 30.5 |
| Intact | 23 | 63.9 |
| Infected sac | 1 | 2.8 |
| Hydrocephalus | 1 | 2.8 |
| Total | 36 | 100 |

The present study shows that there is a decline in incidence of NTDs in comparison to older studies due to various reasons like prenatal screening of fetal anomalies and folic acid supplementation before and during pregnancy. NTDs are etiologically multifactorial (Myriantopoulos *et al.*, 2005) and the epidemiology of NTDs is complex (Frey and Hauser, 2003) Intrauterine diagnosis of NTDs involving spine and spinal cord can be made with an ultrasound or can be suspected by positive screening of maternal serum alpha fetoprotein. After birth an obvious lesion can be seen on the back with a variable amount of neurological deficits, with or without hydrocephalus (Mahapatra, 2012). In our study the incidence of MMC was 3.1 per 1000 live births at the hospital. Our study is also at par with the previous study done by (Li *et al.*, 2013) showing a rural-urban disparity with 73.6% of the MMC patients belonging to rural area. This is attributable to differences in education level, health awareness and maternal nutritional status between urban and rural areas. (Eghwurdjakpor *et al.*, 2002) showed that majority of children presented during the

first month of life. In our study the majority (80.9%) of patients presented in 1-12 months age group. In the study by Mayer *et al* in 2010 (10) the mean weight was 2.9kg. Our study showed comparable findings with 2.36kg mean weight at birth. In the studies done by Agarwal and Sampley (2014) and by Eghwudjakpor *et al.* (2002), it was shown that the most common site of MMC was lumbosacral region. Our study also shows similar findings. MMCs are associated with neurological deficits and skeletal deformities. The careful repair of MMC does not alter the neurological status post operatively, since the damage to the nervous system has already been done in intrauterine life. The results of surgery are not always satisfactory. Ventriculoperitoneal shunting was done for hydrocephalus. In our study, no new neurological deficits were observed in any child in the immediate post operative period or during early follow up.

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