ASSESSMENT AND ALGORITHM FOR MENINGOCELE AND MYELOMENINGOCELE BACK DEFECT REPAIR

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INTRODUCTION

Neural tube defects (NTDs) arises from an occurring defect within the neurulation process. Based on embryological considerations as well as the presence or the absence of exposed neural tissue, NTDs are classified into 2 types: Open Neural tube defects (ONTDs) or Closed Neural tube defects (CNTDs).

ONTDs tend to impact the entire central nervous system (CNS) (e.g., Chiari II malformation, concomitant hydrocephalus). Besides, failure of the primary neurulation process could lead to ONTDs. There may be a possible leakage of cerebrospinal fluid (CSF) due to neural tissue exposure.

CNTDs are commonly localized and confined to the spine (rarely impacting thebrain) arising from a defect within the 2^{ry}neurulation. There is no exposure of neural tissue, and the lesion can be dysplastic.

Cranial presentations include the following:

** Anencephaly.* ** Encephalocele.* ** Congenital dermal sinus.*

Spinal presentations include the following:

** Spina bifida aperta (cystica)*

A-Meningocele. B-Myelomeningocele.

** Spina bifida oculta*

A-Congenital dermal sinus B-Lipomatous malformations (lipomyelomeningoceles)
C-Split-cord malformation

* Diastematomyelia * Diplomyelia
D-Caudal agenesis.

AIM OF THE WORK

The aim of this study was:

Propose an algorithm for closure of back defect in meningocele and myelomeningocele repair.

SUBJECTS AND METHODS

This is a prospective study included 20 new borns with neural tube defect (NTD) admitted to the neurosurgical department in Alexandria Main University Hospital.

In this thesis the patients were classified into 2 groups.

1.The first group with a greatest diameter of the skin defect equal or less than 5 cm.

2.The second group with a greatest diameter of the skin defecd more than 5 cm.

The patients who have rupture myelomeningocele or meningocele were dressed by sterile gauze, warm saline, and non-permeable covering dressing.

The patients were examined by pediatrician to exclude any other congenital anomaly regarding the cardiovascular, respiratory, gastrointestinal and genitourinary system as well as other condition that may hinder general anaethesia or influence both surgical procedures and postoperative care.

All patients were examined neurologically to determine the level of the lesion and its site, extension and characteristic of spinal malformation along ruling out any other linked spine deformity (kyphosis, scoliosis or spilt cord malformation) that may impact on the surgical planning or associated hydrocephalus where the head circumference and state of the fontanelle were examined.

RESULTS

	No	%
Direct closure		
No	12	60.0
Yes	8	40.0
Flap		
No	8	40.0
Rhomboidal (Limberg) flap	5	25.0
Bilateral transposition flap	4	20.0
Double advancement flap	1	5.0
Z- plasty technique	2	10.0

Table 1:
Distribution of the studied infants regarding Type of repair

	Complication				Total	P value
	No "n=14"		Yes "n=6"			
	No.	%	No.	%		
Infection						
No	13	92.9	0	0.0	13	0.013*
Yes	1	7.1	6	100.0	7	
Ratio of defect of back skin area						
30-40 %	3	21.4	0	0.0	3	0.011*
40-50 %	9	64.3	1	16.7	10	
50-60 %	2	14.3	4	66.7	6	
60-70 %	0	0.0	1	16.7	1	

Table 2:
Relation between incidence of complication and characteristic feature of the size of meningocele

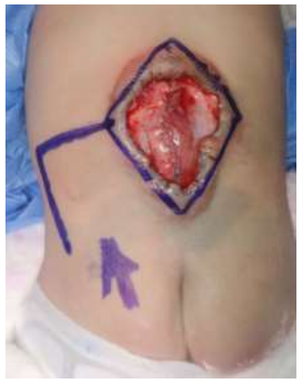

Figure 1:
Design of limberg flap

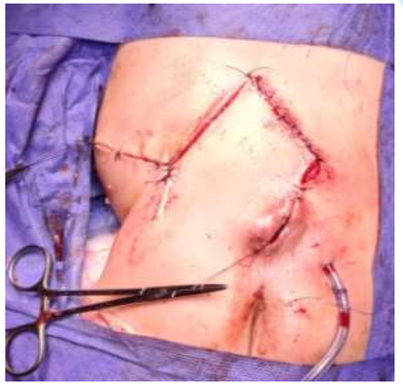

Figure 2:
After closure of skin defect

CONCLUSION

Proposing an algorithm for the skin defect closure in both meningocele and myelomeningocele initiated where:

1-Small meningocele defects, specifically with a diameter less than 5cm, could be easily closed with no extra soft tissue procedure.

2-Square or triangular-shaped skin defects having diameter more than 5cm were closed with the transposition flap rotated on a pivot point or the Z-plasty technique.