Neural Tube Defect

Neural tube defects are a group of common congenital malformations that believed to be caused by failure of the neural tube to close.

Classification

Neural tube defects can be classified, based on embryological considerations and the presence or absence of exposed neural tissue, as open or closed types. According to its location, the neural tube defect includes;

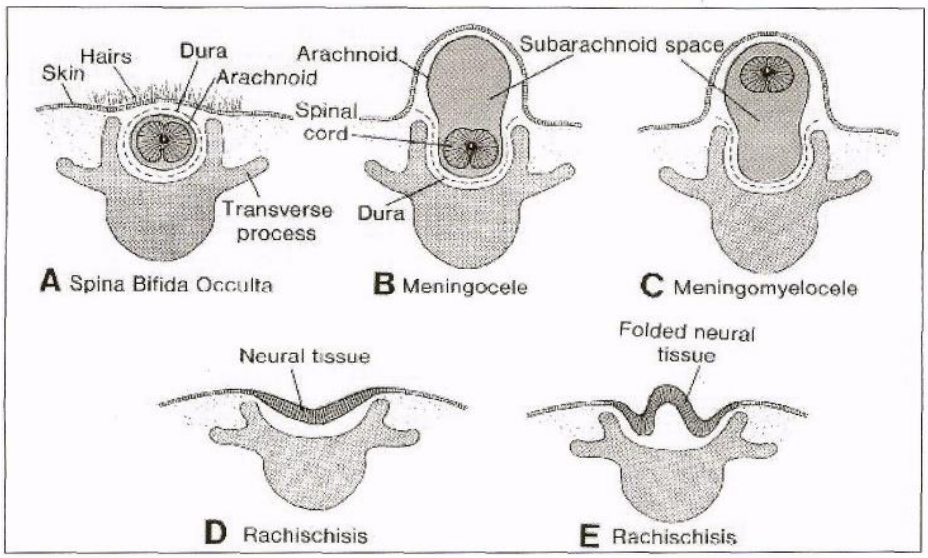
A- Spinal Neural Tube Defect.

Meningocele is the simplest form of neural tube defect which consists of meninges only and contains cerebrospinal fluid (CSF), which is in continuity with that in the spinal canal but has no neural tissue within its confines. This entity is one-tenth as frequent as myelomeningocele and is rarely associated with hydrocephalus.

Myelomeningocele (meningomyelocele): The far more common form of spinal neural tube defect is the myelomeningcele. Rudimentary dura and leptomeninges have developed around and are attached to the malformed neural tube. This type is frequently associated with hydrocephalus.

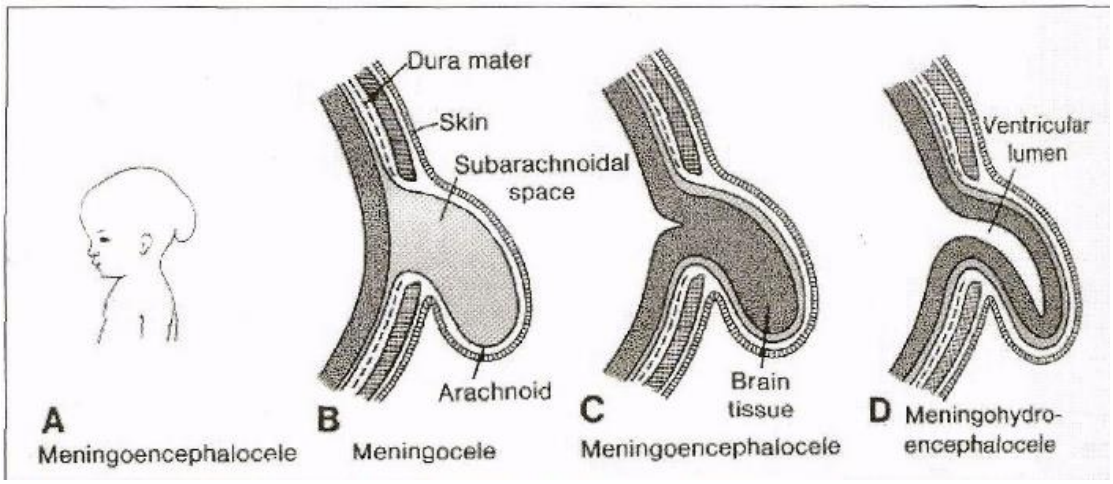
Myeloschisis or rachischisis: is a term reserved for large piece of flattened neural tissue (known as placode) without any encasing meninges. Early hydrocephalus and a severe neurological deficit are present.

A simple defect in the spinal laminae without herniation of tissue is known as spina bifida occulta. A tuft of hair if present over the site of the defect may be the only external sign of this lesion.



B -Cranial Neural Tube Defect

Is malformation characterized by herniation of intracranial contents through a defect in the calvaria. If the cranial herniation contains only cerebrospinal fluid and meninges, it is by definition a **Cranial meningocele.** When the herniation includes meninges and brain tissue (but not ventricles), the term **encephalomeningocele or meningoencephalocele** is applied. **Encephalohydromeningocele or meningohydroencephalocele** involves herniation of meninges, brain parenchyma, and ventricles. A simple skull defect without prolapse of brain or meninges is **cranium bifidum occultum.**



Clinical assessment

The lesion site, type and size are determined and the cranium is assessed for any overt features of hydrocephalus. The infant should be examined neurologically and any neurological deficit should be evaluated. For **Spinal Neural Tube Defect** the neurological assessment of the trunk and lower limbs is based on the segmental innervations of the lower limb muscles. Bladder function should be assessed; frequently, dribbling of small volumes of urine which increases with crying or movements is indicative of future incontinence. Anal sphincter function should be evaluated by performing the superficial anal reflex (S3-S5).

Radiology

Brain CT scan or **MRI** is useful for assessing the cranial neural tube defect and to exclude the associated hydrocephalus for neural tube defect in general. **Spinal MRI** is useful for evaluation of spinal neural tube defect in special circumstances.

Treatment

It must be clear that surgery on the spinal neural tube defect is not designed to repair a faulty spinal cord, which at least in the exposed portion, has not matured beyond the fourth week of pregnancy. No one can improve the neurological disability related to that embryologic disorder: *but operation limits the possibilities of retrograde ascending meningitis and preserves neurological function intact.* The same is applied to the cranial neural tube defect. Therefore; the surgery involve reconstruction of abnormal anatomy, and it is known as **repair of neural tube defect** (example; repair of myelomeningocele or repair of cranial meningocele ....etc).