

# Spina Bifida



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# What is spina bifida?



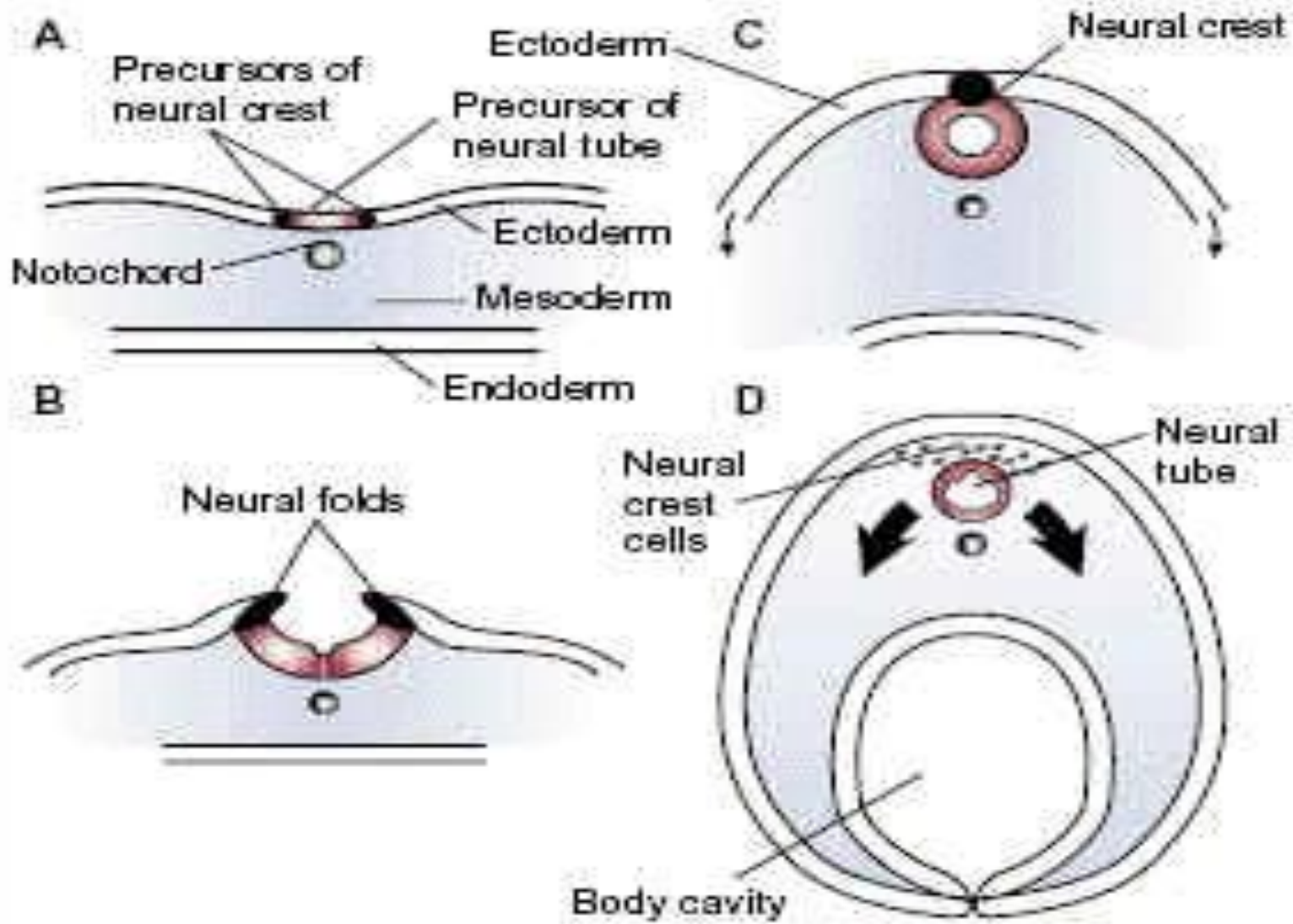
Congenital anomalies resulting from the incomplete closure of the embryonic neural tube.

the vertebrae overlying the open portion of the spinal cord remains infused and open.  
the abnormal portion of the spinal cord sticks out through the opening in the bones.

# Etiology :



- **Genetic** : associated with genetic syndrome but no gene defect is identified .
- **Nutritional** : maternal deficiency of folic acid.
- **Environmental** : teratogen exposure lead to interruption of normal closure .
- **Excessive maternal alcohol** intake during first trimester .
- **Maternal anticonvulsant** .



# Three forms of spina bifida



1. Occulta
2. Cystic :
  - Meningocele
  - Myelomeningocele

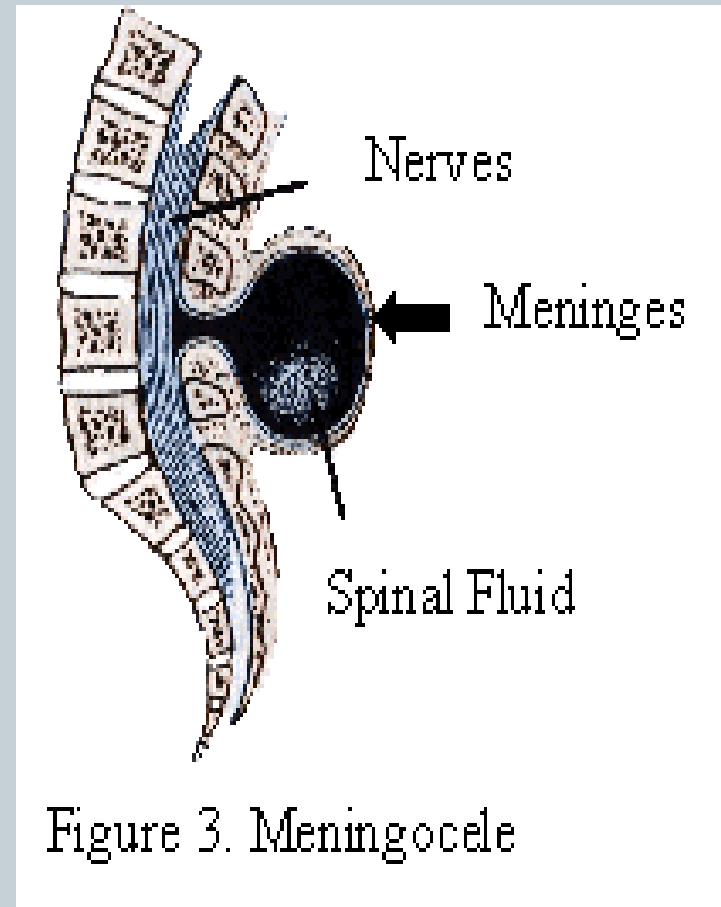
# Occulta

1. mildest form
2. Outer part of vertebrae is not completely closed .
3. no symptoms
4. gap in one or more of the vertebrae of the spine
5. dimple, hairy patch, dark spot or swelling over affected area
6. spinal cords and nerves usually normal
7. no treatment needed



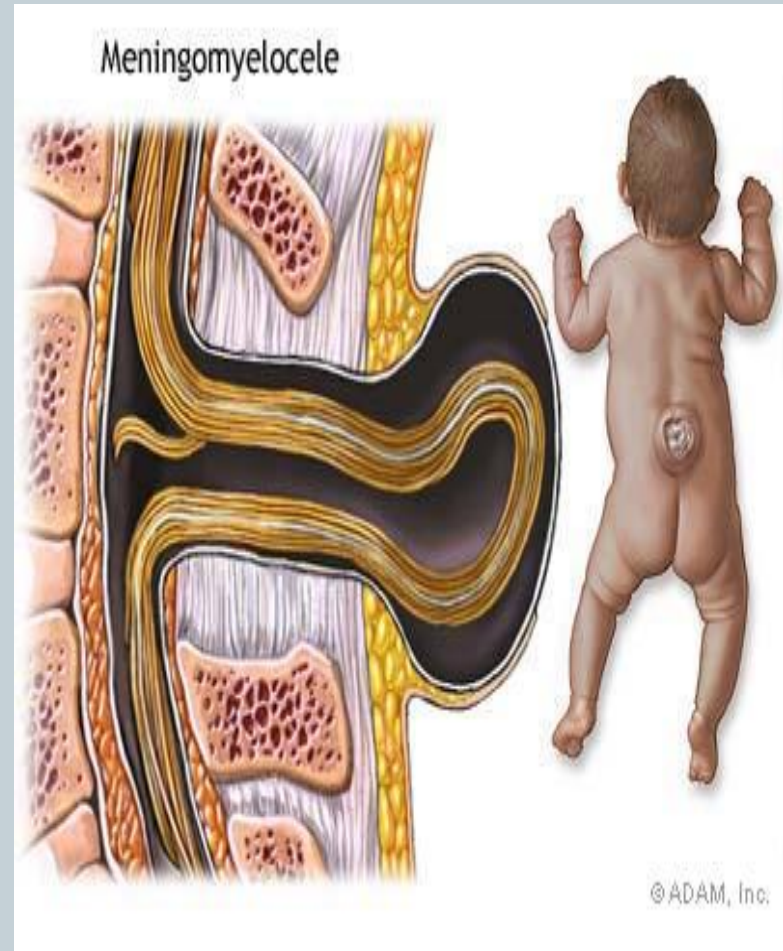
# Meningocele :

1. rarest form
2. cyst or fluid-filled sac pokes through open part of spine
3. **sac contains membranes that protect spinal cord, but not spinal nerves**
4. cyst removed by surgery, usually allowing for normal development



# Myelomeningocele :

- **most** severe form
- cyst holds both **membranes and nerve** roots of spinal cord and, often, the cord itself
- sometimes, a fully exposed section of spinal cord and nerves
- closed surgically after birth
- affected babies: leg paralysis and bladder and bowel control problems





# Clinical features :



- The feature is according to the level of lesion .
- Most common lumbosacral .
- **Include :**
  1. Flaccid paralysis
  2. Muscle weakness
  3. Decreased or absent deep tendon reflex
  4. Sensory impairment in all areas below the level of lesion (light touch , deep pressure , temperature pain, and proprioceptive sensation )



5. Orthopedic problems ( club foot , hip dislocation , scoliosis , bow leg , hip flexion contracture . )
6. Bladder and bowel control problems ( incontinence , urinary tract infection , and poor renal function )
7. Pressure sores and skin irritation
8. Sever vasomotor change
9. Osteoporosis with possibility of fracture
10. Physical , emotional and mental delay .

# Prognosis :



- Meningocele : there is good prognosis
- Myelomeningocele: the child may die from the infection , if he survive after proper closure he lives with stationary disability

# Main complication :



1. Myelomeningocele mass
1. Hydrocephalus (70-90%)
2. Loss of sensation
3. Movement disorder
4. Respiratory problem
5. Incontinence
6. Deformities
7. Social and psychological problems

# Management :



- Surgery (repair the spine and corrective surgery later for further problems develop )
- Surgery to treat hydrocephalus ( shunt )
- Physiotherapy and occupation to improve day to day life and achieve independence in ambulation and ADL .
- Assistive technology such as wheelchair
- Treatment for bowel and urinary tract

**QUIZ**



$$\text{Clownfish} + \text{Clownfish} + \text{Clownfish} = 60$$

$$\text{Clownfish} + \text{Dancer} + \text{Dancer} = 30$$

$$\text{Sunglasses} + \text{Dancer} + \text{Sunglasses} = 9$$

$$\text{Clownfish} + \text{Red Balloon} + \text{Sunglasses} = 42$$

$$\text{Clownfish} + \text{Dancer} \times \text{Sunglasses} = ?$$

# Physical therapy management :



- **Evaluation :**

- **A. By observation :**

- General overview : child appearance and general abilities
- Specific concerned with affected areas as follow :
  1. Tuft of hair , lipoma or dimple in occulta
  2. Localized sac in cystic type
  3. Increased head size
  4. Deformities of lower limb ads flexion abduction and internal rotation and hip, knees hyperextension equines or calcaneus deformity of foot .
  5. posture of trunk ( kyphosis and scoliosis )
  6. Length of lower limbs
  7. Child mobility



## **B. By palpation :**

- Lipoma
- Bony defect

## **C. By measurement :**

1. Round measurement of head
2. Round and long measurement of lower limbs

## **D. Muscle testing :**

1. Group muscle testing
2. Individual muscle testing

## **D. Range of motion :**

Passive and active ROM of all joint of lower limb

**G. Function abilities :** according to the age of child

**H. Assessment** of upper limbs muscle

# Goals of treatment :



- **Long term goals :** to achieve the independency as much as possible
- **Short term goals :**
  1. To promote functional skills to prevent secondary problems as contractures , skin damage
  2. To improve balance and endurance
  3. To improve respiratory function
  4. To encourage the body image and perceptual abilities
  5. To improve social and learning skills

# Physical therapy treatment :



- Facilitation of delayed milestones according to the age of child ( sitting as they have poor sitting balance due to :
  1. Lack of trunk stability
  2. Loss of sensation of lower trunk , buttocks , legs , and feet no proprioceptive and tactile feedback
  3. Large size of head
  4. Paralysis of lower limbs



- To improve sitting :
  1. improve head and trunk control
  2. Strength back muscle
  3. Improve balance from sitting
  4. Improve trunk rotation
  5. Special seat or wheel chair

# Upper limb :



- To compensate the lack of motor control and legs and trunk, strong arms need for :
  1. Helping child to sit
  2. Using hand for wheel chair and crutches
  3. Rising periodically to relieve pressure during sitting
  4. Standing up from the floor or wheel chair
  5. Transferring from seat toile , bed or car

# Physical therapy treatment : cont.



- Graduated active exercise for all affected muscle in the lower limbs to prevent muscle imbalance and to keep the range gained by passive mobilization
- Faradic stimulation
- Passive movement and stretching to prevent and correct deformity
- Facilitation of protective reaction of upper limbs
- Hydrotherapy
- Facilitation of postural fixation mainly pelvis on L L as preparation of standing and walking
- Gait training suitable braces



- Orthoses :  
Depending on level of lesion and affected muscles
- Bladder and bowel management

Thank you for listening!

