Module 6: Deformity

Case presentation: *Adolescent idiopathic scoliosis*

Participants should discuss the incidence, family history, clinical assessment, and treatment principles regarding the management of AIS. They need to be able to identify features indicative of progression and describe the indications for surgical intervention

Lecture: *Adolescent idiopathic scoliosis–assessment, classification, and indications for surgery*

Provide an overview of the incidence, assessment, and management of AIS. Discuss family history and the identification of red flags related to age of onset, rate of progression, neurological features, and congenital anomalies.

Participants must also understand the need for a detailed clinical and neurological evaluation in order to identify red flags (such as tumors, neural tube abnormalities, and connective tissue and muscular disease) and their association with spinal deformity.

Review radiographic assessment and the interpretation of plain x-rays, bending and traction films, and the place for and interpretation of MRI, CT, myelography, etc.

Outline the commonly used classification systems and key features regarding the likelihood of progression, the role of and indications for brace treatment, and the indications for and timing of surgical intervention.

Outline the surgical principles of correction, achieving or maintaining balance, and minimizing the number of levels to be fused. Common complications and their management should also be covered.

Learning outcomes

- Perform a screening clinical examination in patients with AIS
- Request and interpret appropriate radiographic investigations
- Describe the main classification system (Lenke) for AIS
- Outline the treatment principles in the management of AIS
- Identify significant associated pathology

Case presentation: *Adolescent idiopathic scoliosis*

Present details of treatment strategy and outcome.

Case presentation: *Congenital scoliosis*

Participants should discuss the etiology, incidence, classification, and association with other congenital anomalies. The clinical assessment and treatment principles regarding the management of congenital scoliosis should be addressed, but the focus should be on identifying factors indicating progression or a risk to neurological structures.

Lecture: *Congenital scoliosis*

Go over the embryology of spinal development and the development of congenital defects of the spine due to failure of formation, failure of segmentation, or a combination of these.

Review associated congenital anomalies and the assessment of growth potential, which is a major determinant in relation to the indications for surgical intervention. Discuss the principles of treatment, observation, bracing and surgery, and discuss factors that influence the timing of any surgical intervention.

Also review common complications of treatment and the fact that many patients with this congenital spinal deformity are diagnosed incidentally on a chest or abdominal film performed for other reasons or an intrauterine ultrasound. The need to educate parents and monitor progression through growth should be emphasized.

Learning outcomes

- Identify and classify congenital abnormalities of the spine
- Discuss the treatment principles and options
- Recognize associated anomalies and common complications of treatment
- Describe the natural history to enable discussion with parents regarding natural history, need to monitor, and likelihood of surgery

Case presentation: *Degenerative scoliosis*

Participants should discuss the incidence, etiology (AIS or de novo due to degenerative disease), natural history, clinical and radiographic assessment, and treatment principles.

Lecture: *Degenerative scoliosis–considerations and indications for surgical treatment*

Discuss the natural history and common presenting features of adult or degenerative scoliosis and the fact that they will often present with a combination of symptoms related to imbalance, neural or canal compression, and degeneration.

As patients are often elderly the association with other comorbidities (such as diabetes, osteoporosis, cardiac and respiratory disease, as well as degeneration of the hips, knees shoulders and SI joints) that add to the risks of surgery need to be considered.

Definition of the goals of surgery, nonoperative treatment strategies, and evaluation of risks vs benefits should be emphasized.

The indications for surgery and the need to define the surgical goals (spinal balance, neural decompression, and the avoidance of complications such as junctional breakdown nonunion, and implant failure) should be reviewed. As participants are unlikely to be undertaking the assessment of these patients or planning treatment independently, the focus should be on the principles of treatment and evidence-based indications for intervention.

Also make the participants aware of common complications and their management.

Learning outcomes

- Outline the treatment principles and options in relation to adult or degenerative spinal deformity
- Recognize associated comorbidities and their influence on the outcome of surgery
- Outline the principles in relation to restoration and maintenance of spinal balance
- Perform assessment in relation to restoration and maintenance of spinal balance