International Journal of Advanced Multidisciplinary Research
ISSN: 2393-8870
www.ijarm.com
DOI: 10.22192/ijamr Volume 7, Issue 7 -2020

Case Report
DOI: http://dx.doi.org/10.22192/ijamr.2020.07.07.003

Management of Scoliosis – A case report

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Introduction

Scoliosis is the lateral curvature of the spine in the upright position. The lateral curvature is usually accompanied by some rotational deformity. Nature has designed four physiological curves in the so called erect spine, cervical and lumbar lordosis, dorsal curve in the thoracic spine and sacral region. Thus when the spine develops a lateral curve it is abnormal. It throws the well –adjusted spinal mechanism out of gear and poses the following problems:

1. A cosmetically unacceptable deformity.
2. Deranges the load and force transmission mechanism through the spine.
3. Compromise the functions of vital organs like lungs, heart by overcrowding the ribs.
4. Managing it is cumbersome and unrewarding experience most of the times.

Fig: 1 Scoliosis

Signs &Symptoms:

Since scoliosis usually isn't painful, it can go undetected until there are obvious, visible signs that can include:

- A curved spine that looks like an "S" or "C," rather than a straight line down the back.
- Tilted, uneven shoulders, with one shoulder blade that sticks out more than the other.
- Prominence of the ribs on one side.
- Uneven waistline.
- One hip that is higher than the other.
- Twisted (also known as oblique) pelvis.
- Signs of an underlying spinal defect, including light-brown birthmarks, hairy patches, dimples and spinal masses on the skin.
- Unequal distances between the arms and sides of the body when a child stands upright or bends forward.
- A hump on one side of the back.

Fig: 2 Symptoms of scoliosis

Examination:

Cobb's method to measure severity of the curve:

The upper and lower vertebrae are identified. The upper end vertebra is the highest one whose superior border converges towards the concavity of the curve and the lower end vertebra is the one whose inferior border converges towards the concavity. Intersecting perpendicular line from the superior surface of the superior end vertebrae and from the inferior surface of the inferior end vertebrae are drawn

The angle of deviation of these perpendiculars from straight line is the 'angle of the curve'.

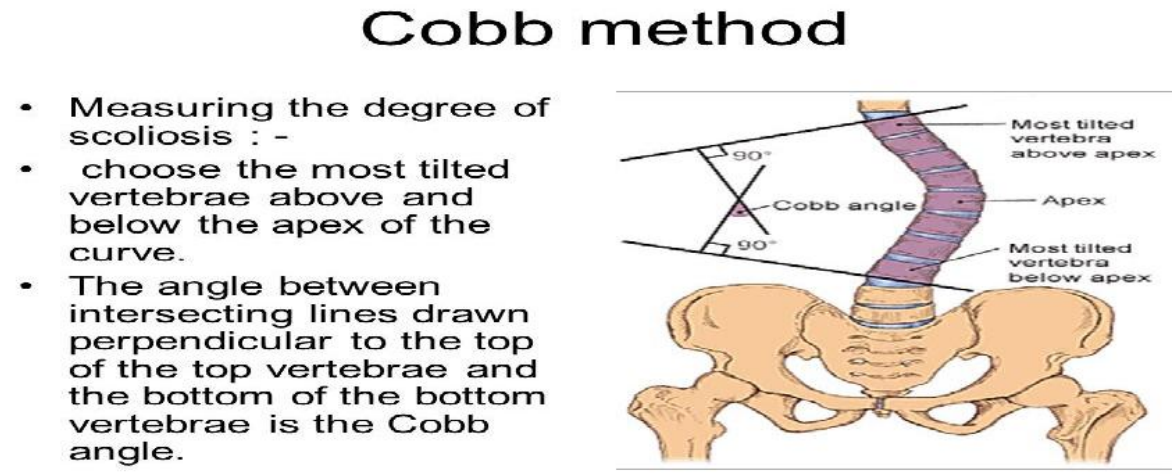

Fig:3 measurement of Cobb's angle

Treatment:

As an adult, your spine is no longer growing, but it is important to stabilize your spine and lessen symptoms.

Surgical treatment: Spine stabilization surgery is recommended for patients whose deformity causes pain that interferes with normal daily function and occasionally for those who suffer from a severe cosmetic deformity. Spine stabilization surgery realigns and stabilizes the spine as safely as possible. This is done by fusing the bones of the spine (vertebrae) together using bonegrafts.

Metallic implants hold everything in place while the fusion matures. The majority of patients experience a quick recovery after surgery.

The basic principles of surgical treatment in scoliosis are:

1. Correction of the curve
   - Turnbuckle cast technique (Risser's)
   - Distraction techniques
   - Loosening of the Curve
2. Maintenance of the correction achieved
3. Spinal Fusion
   - Spinal instrumentation

a) Harrington instrumentation
b) Segmental spinal (Luque) Instrumentation
c) Dwyer's Instrumentation
d) Zielke instrumentation

Physiotherapy management:

Postural correction:

Special emphasis is placed on correction of faulty posture by active and passive methods:

Active method:

The positions at which the curve is corrected are identified. The patient is then instructed to adopt that position and try to attain the correction.

Passive method:

a) Unequal traction: the best way to provide this is to instruct the patient to hang from the suspension with one hand.
b) Axial traction: with the patient in supine position traction is given along the direction of the leg and pelvis by one physiotherapist while counter traction is given by another physiotherapist in the opposite direction along the chin and occiput. This help to obtain the correction.

Exercises:

1. Deep breathing exercises.
2. Balancing exercises by instructing the patient to walk with the book on the head.
3. Active ROM exercises to the spine.
4. Strengthening exercises to the abdominal and spinal muscles.
5. Passive stretching of the muscles on the concave side of the curves is highly effective.

Orthotic treatment:

Orthotic treatment with Milwaukee or Boston Brace is recommended for patients with structural scoliosis for curves less than 40^{o}. Active exercises within the brace prevent deterioration and maintain the correction obtained. The brace has a stretching effect on the spine and by putting a pad over the rib hump on the convex side of the curve, correction for the major curve can be obtained.

Fig: 4 TLSO Brace

Case study:

An 18 years old boy had deformity of back since 2 years. The deformity of back gradually became progressive and associated with pain. Weakness of bilateral lower limb with difficulty in climbing down stair and getting up from sitting position. Due to severe deformity the orthopaedic surgeon planned to do the surgery.

Surgical treatment:

Segmental spinal (Luque) instrumentation

In this operation, multiple wires are passed beneath the laminae of the vertebrae in the curve, on either side of each spinous process. The wires are then twisted around two tods placed on either side of the spinous processes and tied (Fig. 15.13). This instrumentation not only corrects the curve but de-enhances the arthrodesis. The fixation is usually rigid and does not require external immobilization.

Physiotherapy treatment:

After surgery physiotherapy treatment was given to the patient for 5 days.
Aim of physiotherapy treatment given to the patient was to correct the deformity and increase muscle strength.

During first 5 days

- Chest physiotherapy and deep breathing exercise to prevent pulmonary complication.
- Spirometery to improve vital capacity of lungs.
- Ankle toe pumping to prevent from DVT and improve circulation.
- Active exercise of upper limb.
- By 2nd day sitting (with lumber brace), Quads dynamics, Quads isometrics and side turning is started.
- By 3rd day standing with brace and walking with the help of walker.
- By 4th and 5th day patient is instructed for toilet training and stair climbing.
- Patient is discharged after 5 days and advised to follow the above exercise.

Home advice was given to the patient:

- Home exercise program and avoid heavy weightlifting.
- Use western toilet
- Avoid prolonged standing.

Outcome

Regular follow up was continued for next 4-5 months. The patient followed the exercise routine given by the therapist and regularly consulted both the orthopaedic doctor and the therapist. The results were very good and after a period of 5 months a remarkable postural correction was observed in the patient. This very observation from the case study concluded the fact that physiotherapy treatment after surgical correction in severe scoliosis cases gives good results.

Acknowledgement of financial support: NA

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	Website: www.ijarm.com
Quick Response Code	Subject: Medical Sciences
DOI:10.22192/ijamr.2020.07.07.003	

How to cite this article:
Mukesh Kumar Goyal, Vikram Arora. (2020). Management of Scoliosis – A case report. Int. J. Adv. Multidiscip. Res. 7(7): 18-23.
DOI: http://dx.doi.org/10.22192/ijamr.2020.07.07.003