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A CASE OF SCOLIOSIS SECONDARY TO HIGH GRADE DYSPLASTIC SPONDYLOLISTHESIS AND ITS MANAGEMENT

Orthopaedics

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ABSTRACT

Scoliosis is defined as a structural deformity of the spine in all three dimensions and diagnosed if the Cobb angle is ≥10 degrees. Scoliosis may be associated in upto 48% cases of spondylolisthesis, being more commonly encountered in high grade listhesis (>50% slip) and is often seen in dysplastic types. We are reporting a case of a 12 year old premenarchal female with progressive deformity of back and chest for 10 months associated with back and leg pain. Radiographs revealed grade 4 dysplastic spondylolysthesis with a long C shaped curve (King type 4) with left convexity. Reduction of lysthesis and instrumented fusion from L4 to S1 was performed. Post operatively there was immediate correction of scoliosis with resolution of clinical symptoms. Knowledge about olisthetic scoliosis helps in early identification of patients with scoliosis caused by spondylolisthesis, who require surgery only for the latter condition, avoiding unnecessary surgery for scoliosis.

KEYWORDS

scoliosis, spondylolysthesis, olisthetic, dysplastic, surgery

CASE REPORT

A 12-year-old premenarchal female presented with a 10 months history of progressive deformity in the back. It was associated with back and leg pain on prolonged standing or walking. On examination she had a thoracic scoliotic deformity to the left along with a visible lumbosacral kyphosis. The patient had slight forward stooping posture with knee flexion, hamstring tightness and exaggerated lumbar lordosis. There was truncal asymmetry and shoulder asymmetry, suggestive of coronal imbalance. On Adams forward bending test, the patient had prominent rib hump on the left, along with persistent scoliosis. There was no neurological deficit.

Antero-posterior imaging revealed a smooth C shaped scoliotic curve with convexity to left (King type 4) extending from the cervicothoracic to the lumbosacral junction with a Cobbs angle of 44.2□ (Fig 1). End vertebra was T2 and L4 with apex at T7. Lateral radiograph showed meyerding Grade IV spondylolisthesis with a dome shaped sacrum, trapezoidal L5 vertebral body, spina bifida occulta suggesting a dysplastic etiology with reduced sacral slope and a lumbar lordosis - pelvic incidence mismatch. A CT scan revealed hypoplastic L5 pedicle on the left side, along with spina bifida occulta and dysplastic L5S1 facet joints. It was decided to treat the patient surgically, first by addressing the spondylolisthesis and then surgical correction of scoliosis if necessary,at a later date.

The patient was operated via a standard posterior midline approach under neuromonitoring. Wide exposure from L4 to S1 was done and bilateral L4, S1, and unilateral L5 pedicle screws were inserted under fluoroscopic guidance. A wide laminectomy at L5 followed by foraminotomy of the L5 nerve root was done to prevent excessive stretch while reduction (Fig 2). This was followed by L5S1 discectomy and sacral dome osteotomy across the anteroinferior edge of L5, to facilitate the reduction of subluxed L5 vertebra over S1. A precontoured rod was then fixed to L4 and S1 screws while using a reduction tower to gradually reduce L5 while distracting anteriorly with an osteotome. Finally, the rods were tightened after tricortical iliac crest bone grafting of the disc space. The patient had an uneventful recovery and was ambulatory the following day.

A full length Xray on the third postoperative day revealed a near complete resolution of the scoliosis and improvement in sagittal balance (Fig 3). There was partial reduction of listhesis and improvement in pelvic parameters. At 3 months followup, the patient is doing well with resolution of clinical symptoms and there are no apparent sagittal or coronal plane deformities.

DISCUSSION

Scoliosis is defined as a structural deformity of the spine in all three dimensions and diagnosed if the Cobb angle is ≥10 degrees. Scoliosis may be associated in upto 48% cases of spondylolisthesis, being more commonly encountered in high grade listhesis (>50% slip) and is often seen in dysplastic types[1]. Dysplasia and anatomic anomalies including dome shaped sacrum, trapezoidal L5 vertebra, spina bifida occulta, and hypoplastic lumbosacral facet joints, are often implicated in slip progression and lumbosacral kyphosis, eventually culminating in sagittal imbalance.

Scoliosis coexisting with spondylolisthesis has been classified into 3 types- olisthetic type; due to asymmetrical vertebral rotation and translation at the lumbosacral junction, sciatic type; due to stretching of L5 nerve root resulting in a sciatic list, and thirdly, idiopathic scoliosis; which is an independent pathology that needs to be addressed separately from the listhesis.

Olisthetic and sciatic scoliosis are usually amenable to correction of primary pathology, i.e, spondylolisthesis which usually leads to resolution of the scoliosis unless there is significant rotation or structurality, due to being left untreated for a long time[2,3]]. Idiopathic scoliosis on the other hand is usually seen in the thoracic region and has significant rotation, believed to be unrelated to spondylolisthesis. It often requires surgical correction of both the listhesis and scoliosis in a single or staged setting.

Correction of dysplastic spondylolisthesis is difficult and often controversial. There is a debate regarding the need of reduction in high grade dysplastic listhesis[4,5]. Reduction, while helping achieve correction of pelvic parameters and sagittal imbalance, is fraught with the risk of tension injury to the L5 nerve root leading to foot drop, which may be permanent and lead to significant disability. Non reduction with insitu fusion, on the other hand, increases the risk of nonunion due to increased shearing forces at the lumbosacral junction. It may also fail to address any concomitant scoliosis.

Most commonly used surgical maneuver consists of an extensive release, sacral dome osteotomy, and transpedicular fixation supplemented by interbody fusion. A partial reduction is often carried out to improve pelvic parameters and fusion, while taking care to avoid excessive L5 nerve root stretching by performing wide lamino

foraminotomy bilaterally[6]. It is preferable to perform the procedure under neuromonitoring to assess any iatrogenic stretch injury to the nerve roots and reverse the corrective maneuvers before the damage is permanent. It is imperative to perform the reduction gradually in small increments, to mitigate the risk of screw pullout, in the background of hypoplastic pedicles and soft tissue contractures. Level of fixation can be extended of one level above the pathology to increase the stability. Postoperative bracing may be used to protect the instrumentation till radiographic evidence of fusion.

CONCLUSION

Spondylolisthesis associated with scoliosis may be successfully managed by correction of the listhesis alone. Knowledge of this entity might help reduce the incidence of unnecessary surgery for scoliosis and consequent morbidity in the majority of cases.

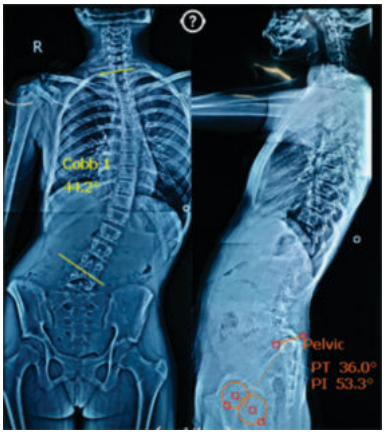

Fig. 1) Whole Spine Standing Ap And Lat Radiographs Demonstrating A Left Sided Scoliosis With Coronal Cobb Angle Of 44.2 Degrees And Lumbosacral Kyphosis With Pelvic Tilt Of 36 Degrees.

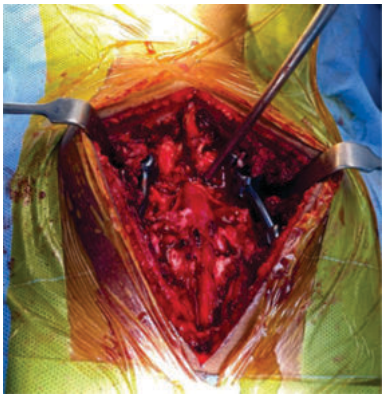

Fig. 2) Intraoperative Photograph Showing Adequate Decompression Of L5 Nerve Root And Implants In Situ

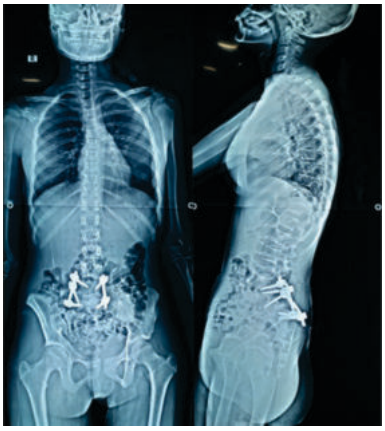

Fig. 3) Post Operative Radiograph Showing Complete Resolution Of Scoliosis And Improvement In Sagittal Balance

REFERENCES

1. Fisk JR, Moe JH, Winter RB (1978) Scoliosis spondylolysis and spondylolisthesis. Their relationship as reviewed in 539 patients. Spine 3(3):234–245
2. Zhou Z, Song Y, Cai Q, Kong Q (2013) Spontaneous resolution of scoliosis associated with lumbar spondylolisthesis. Spine J 13(5):e7–e10
3. Pneumaticos SG, Esses SI (2003) Scoliosis associated with lumbar spondylolisthesis: a case presentation and review of the literature. Spine J 3(4):321–324
4. Rengachary SS, Balabhandra R (2002) Reduction of spondylolisthesis. Neurosurg Focus 13(1):1–3
5. Hanley EN Jr, Levy JA (1989) Surgical treatment of isthmic lumbosacral spondylolisthesis. Analysis of variables influencing results. Spine 14(1):48–50
6. Smith JA, Deviren V, Berven S, Kleinstueck F, Bradford DS (2001) Clinical outcome of trans-sacral interbody fusion after partial reduction for high-grade L5–S1 spondylolisthesis. Spine 26(20):2227–2234